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THE
ARCHITECT
AND
CONTRACT REPORTER.

VOL. LIII.

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THE
ARCHITECT

AND

Contract Reporter.

A WEEKLY

ILLUSTRATED JOURNAL

OF

ART,

CIVIL ENGINEERING,

AND

BUILDING.

"All invention, sir, comes by degrees and on the view of nature; a world of things concur in the design which makes it feasible if art conduce."—INIGO JONES (reported by Ben Jonson).

VOL. LIII.

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A JOURNAL OF ART, CIVIL ENGINEERING & BUILDING.

THE WEEK.

THE annual report of the Royal Society of Antiquaries of Ireland refers to the untimely death of Mr. JOHN L. ROBINSON, architect, who was one of the most useful and active members of the Society. On the formation of the committee for the purpose of carrying out the photographic survey of the antiquities of Ireland, Mr. ROBINSON consented to act as hon. curator, and in connection with this undertaking his loss will be most severely felt. The Council are, however, making arrangements for carrying on the work. It is announced that on Whit-Monday Kilkenny will be visited, and on the following days the city and county of Waterford. For some years past it has been the wish of the Council to hold a meeting in Connaught. It is now proposed to make Galway the headquarters for the summer meeting and excursion in the first week of August, and to visit the three Islands of Aran. As it would be necessary to charter a large passenger steamer from Belfast, with suitable sleeping accommodation, about a hundred members would have to join in the excursion. They would have the opportunity of visiting the Western Islands, including Tory Island, Inismurray, Clare Island, High Island, as well as the Aran Islands. This trip would occupy from Tuesday to Saturday, leaving Belfast on Tuesday and arriving at Galway on Saturday afternoon. The cost for each member, including steamer, sleeping berth and board, would be 6*l.* 10*s.* It is proposed to hold the fourth quarterly meeting of the Society in Wexford, in September, with three day excursions in the county, and there will be some day excursions from Dublin, including a trip to the Loughcrew Hills in June. Visitors to Ireland who can take part in the outdoor work of the Society will have this year opportunities of seeing pleasant places in good company.

THE jury for examining the plans of the projected new Ghizeh Museum building is composed of FAKHRY PASHA, Minister of Public Works (president), MUSTAPHA FEHMY PASHA, TIGRANE PASHA, YACOB ARTIN PASHA, Sir ELWIN PALMER, Messrs. GARSTIN, DE MORGAN, BARVIS, who form the present Museum committee, and the six Commissioners of the Public Debt. It is intended also to request the assistance of four architects of European eminence, to whom all the competing plans would be first submitted. Mr. SOMERS CLARKE will probably be one of the four. The 1st of March next is the latest date on which plans will be received by Government.

It must require unusual courage for a town councillor to become a member of the Library and Arts Committee of the Liverpool Committee. Every recommendation of that committee is treated differently to those which emanate from other departments, and money is granted most grudgingly. The latest case arose on Wednesday. It was proposed to purchase a picture of an idyllic kind by Mr. ARTHUR WARDLE, a local artist, the price being only 80*l.* The grant of the money was opposed on the ground that only first-class works should be acquired. There is no use in having an art committee unless respect is given to the

judgment of the members, and hitherto in Liverpool the recommendations, although they did not always find favour with the Council, were of a kind which were approved among amateurs. It would be absurd to limit the books in a public library to the epics in prose and verse, and in a picture gallery various needs must also be considered. The Liverpool aldermen and councillors, who insist on the rejection of all paintings which are not masterpieces, are, we suppose, gentlemen of most refined taste, but they ought to remember that all the citizens are not equally endowed by nature and culture.

WE regret to announce the death of Mr. HAROLD SWAINSON, who was joint author with Mr. W. R. LETHABY of the interesting volume, "The Church of Sancta Sophia, Constantinople; a Study of Byzantine Building," which we recently reviewed. The parts which were derived or translated from classic or foreign languages were mainly his work. It is pointed out in the book that the constructive methods which were employed in JUSTINIAN'S church are not obsolete, and Mr. SWAINSON was engaged in a further study of the continuance of traditional processes among the Coptic and Arab builders at the time of his death, which occurred suddenly on December 31. He had only reached his twenty-sixth year.

THE small but most convenient diary and collection of tables for architects which Messrs. SPRAGUE & Co. have issued for several years, and which has become a sort of *vade mecum* in the profession, appears in an improved form. All the tables and memoranda have been revised by Mr. F. R. FARROW, and information has been added without an increase of bulk. The little book is a model of condensation, and its utility is unquestionable.

AN important judgment has been given by Mr. Sheriff SPENS, in Glasgow, which suggests the peculiarity of Scottish law about party walls or mean gables. A brick wall 23 inches thick separated two properties, and therefore occupied 11½ inches of each property. It was proposed to erect a building four storeys, or 51 feet, high on the top of the wall. The owners on the opposite side objected, and litigation began. The Sheriff declares that the plaintiffs have no right to use the wall for the purposes proposed. He grounds his opinion mainly on a decision by Lord CLIFFORD, who held that where there is no room for implied contract and implied consent the builder of a tenement must build its gable and all entirely upon his own ground unless he gets the consent of his neighbour. In this opinion Lord GIFFORD, Lord Justice-Clerk MONCRIEFF and Lord NEAVES concurred. The Sheriff considered that to raise a structure 51 feet high would make a material difference in the light of the premises adjoining, and accordingly dismissed the action. The question arose as to whether the wall was to be regarded as a mean gable or a mean division wall, and all the architects and builders in Scotland, as well as the lawyers, would be divided in opinion about the answer to be given; but the Sheriff made short work of so subtle a pleint, for he said it was indifferent to him what name was given to the wall.

G. E. STREET AS A DRAUGHTSMAN.

TO understand the perspective drawings of the late Mr. STREET, R.A., it would be well to begin with a consideration of some of his letters in which he introduced sketches. They would show how closely his verbal descriptions or instructions were associated with his drawings, and as one class of expression supplemented the other it was sometimes difficult to determine which had precedence

out of every bit of a building; but Mr. STREET was either too busy or too indifferent to trouble himself about anything less than general views.

We have reproduced on a small scale a few of his drawings, to enable us to ascertain whether there were any characteristics in his work sufficiently consistent to constitute a style. It will be evident, in the first place, from the engravings, that the point of view selected was always one which allowed the greater part of a building to be seen, and



HOUSE AT HOLMDALE, SURREY, 1874.

with him. The same pen and the same ink served him in his calligraphy and in his sketches; he could write and draw with equal facility. There are some architects who are admirable draughtsmen but who hate expressing their thoughts in writing, while there are others who can compose reports and long pages of communications without hesitation about words or phrases, but they are compelled to leave the necessary diagrams to be filled in by an assistant. Mr. STREET possessed a capacity for explaining clearly and with fluency his thoughts in both ways. It might be supposed he could instinctively discriminate between the representable and the non-representable things which constitute the world, and that for the former he considered figures were more suitable exponents than words.

His drawings, especially those in which he represented buildings and structures as a whole, may be said to possess a sort of descriptive character. Mr. STREET rarely attempted to appear as a pictorial artist; his aim was simply to convey an idea of his building by means of lines which he employed because they were more effective for his purpose than words. Accordingly, there is a remarkable impartiality (no other word is so apt) about his drawings. All parts are treated uniformly. We cannot see signs of his lingering over a tower or a chancel, a window or a porch, as if he felt any of them was a happy thought, a sign of inspiration or a source of peculiar pleasure to himself. On that account his drawings may appear to be deficient in artistic quality. A painter who anxiously seeks that quality never cares to represent a building thoroughly. He believes in degree and priority as well as in proportion, and accordingly he selects some part on which he confers a sort of supremacy. By so doing he allows imagination to have some chance, for those who gaze on the view will endeavour to create the whole building from it. REYNOLDS may have had the arrangement in his mind when he said, "There is in architecture, as in painting, an inferior branch of art, in which this imagination appears to have no concern." Many architectural draughtsmen act on that principle in treating proposed works. That architects also approve of the arrangement is evident from the number of views of parts of buildings which are to be seen from time to time. There is no reason why as much as possible should not be made

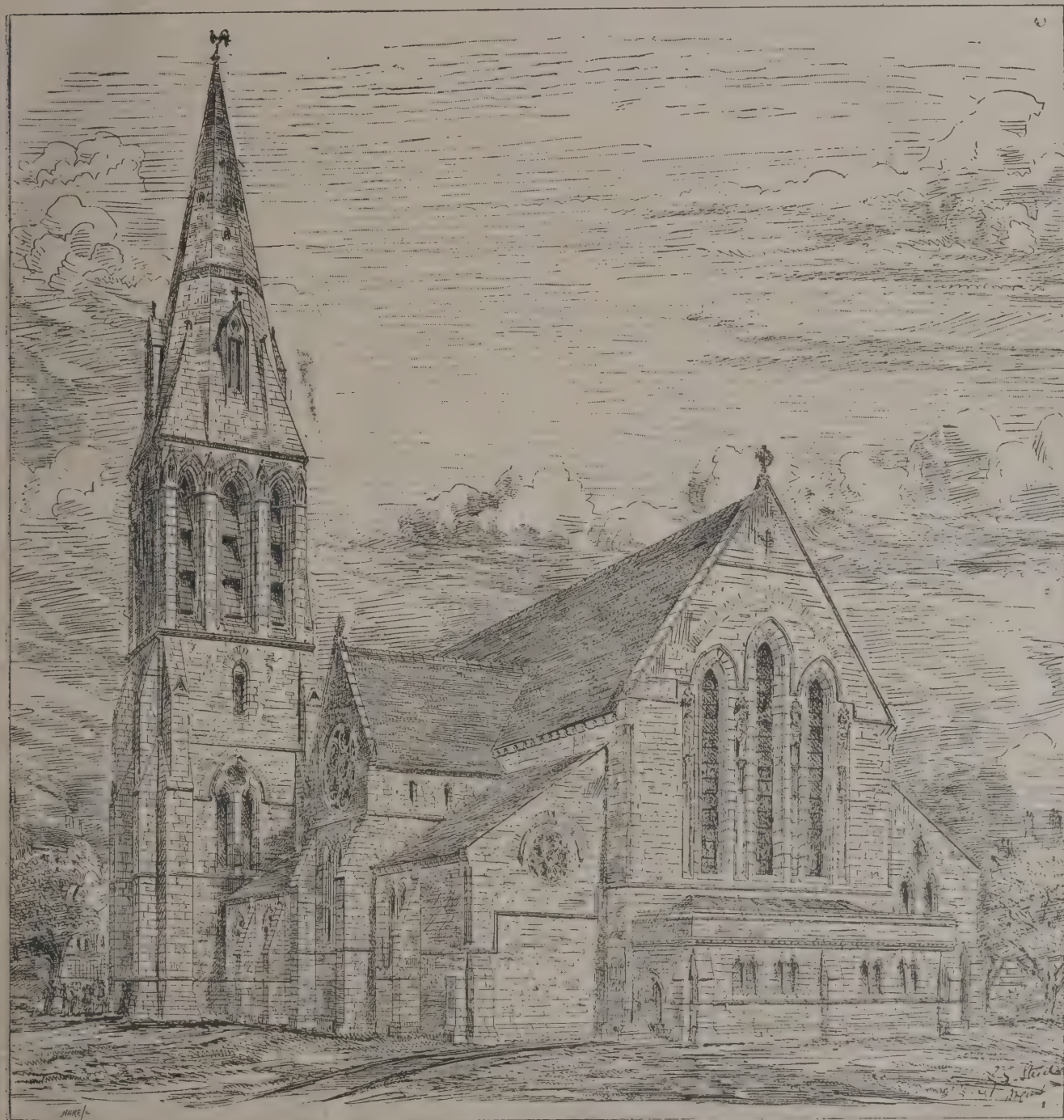
the arrangement on plan to be inferred. In the next place, all the main lines, although they are often fine enough to suggest the geometric definition of length without breadth,



ST. DIONIS BACKCHURCH, 1858.

are continuous and carefully ruled. It is sometimes supposed that broken lines are among the producers of picturesqueness, and that it is an advantage when a drawing appears to have been completed without much use of a T-Square. In representing old work, as in the transept aisle of York Cathedral, which is near the monument of Dean DUNCOMBE, Mr. STREET allowed himself a liberty of that kind, but it is evident he considered that precision was

have gained in effect. But as we have said already, pictorial effect was of little importance to Mr. STREET when it had to be obtained by a sacrifice of verity. His views are practically descriptions which could be offered as evidence in Courts instead of photographs. For the same reason he never made as much out of the shadows which were cast by the projections of his buildings as he might have done. Apparently he considered his purpose was served



ST. MARY'S CHURCH, SOUTHAMPTON, 1877.

required when new buildings, or anything appertaining to them, were to be represented. The gables and windows of his Surrey house suggest the *finesse* with which he endeavoured to express intricate detail on a small scale without any abridgment of length. His love of truth is also seen in the care taken to demonstrate that the walls of the buildings were masonry and of what class. If he treated some of the sides of the buildings as if they were characterless, that is, as blank spaces, his drawings would be declared to

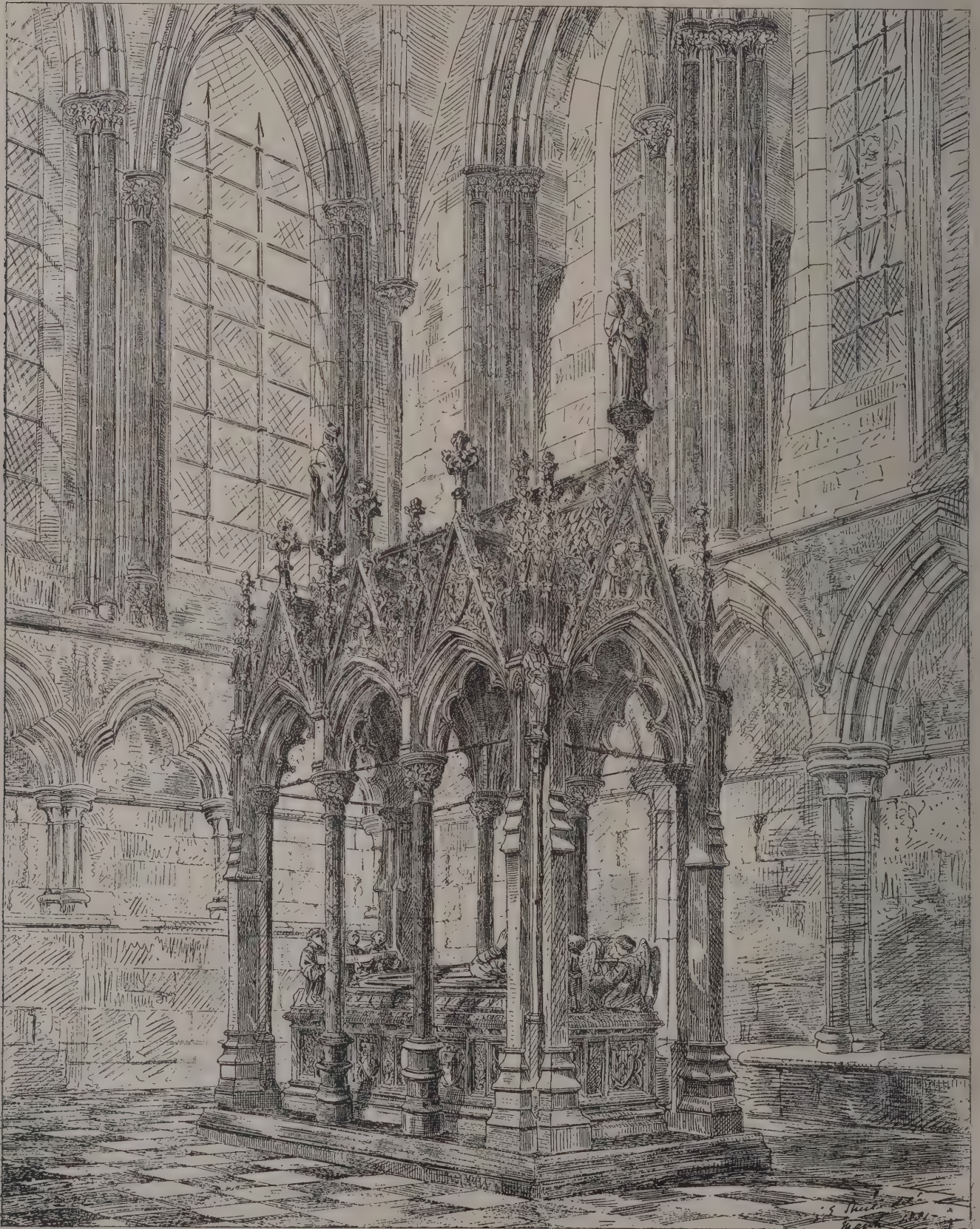
when the variety of planes were indicated. Strong shadows are also likely to obscure detail, which was not desirable to his mind. His figures were almost insignificant, but generally he was indifferent to their use as units of scale. His trees and foregrounds were always of the simplest. When, as in the view of the Brightwaltham Church, the lychgate and school are introduced by a few careless scratches, we may be sure they formed no part of his commission.

In spite of the restraints he imposed on himself and

the simplicity of his aims, his drawings have a sort of vital quality. They are as characteristic of the author as his handwriting. This fact will be evident by a comparison of the reductions of his drawings with one from a fine lithograph which was copied from a drawing by Mr. STREET, representing a proposed church in Fenchurch Street. It is evident that the lithographer drew all the lines with painstaking accuracy, but somehow they have not the "go" which is visible in the drawings, although to the multitude, on account of their animation, the latter may seem to be less perfect. If the church represented had been carried

out, the City would have acquired something that possessed novelty no less than beauty.

If in the architectural lines Mr. STREET tried to be as exact as the scale of the drawing would allow, he found compensation in dealing with accessories. Writing masters of the old school used to exhibit wonderful productions which were declared to be created by a single stroke of the pen. Mr. STREET's trees often seemed to be examples struck off in rivalry with the ornamental caligraphy. The outline of a group of trees would be completed without the pen being raised from the paper, and a few zigzag



MONUMENT OF DEAN DUNCOMBE, 1881.

touches would then be put in to express the remaining greenery. His zigzags were of great utility to him, for they served many purposes. They were made to suggest shadows, masonry, foregrounds, as well as vegetation. We suppose Mr. STREET considered they produced an effect of continuity, and they answer as well as repetitions of colour to unite different parts of his drawings. Occasionally they were introduced to make up his cloud effects, but TURNER himself would be unable to express the phenomena of the "azured vault" if he were restricted to pen and ink. The free strokes which Mr. STREET employed around his buildings had the advantage of giving more effect to the architectural lines which formed a contrast with them. As all his lines were fine, it was not easy to make his drawings appear vigorous, yet they have more effect of that sort than many drawings which were made up of far thicker lines. The reason is that every line of Mr. STREET's was drawn

writing a word or two about drawings of another sort. Mr. STREET's working drawings were models of clearness, although they were not always free from altered lines, for he was painfully anxious about the accuracy of details, and he was competent to design for every kind of material that was employed in one of his buildings. His manner of sketching might be called peculiar, for it was, as it were, a language or shorthand which was more significant to him than it could be to a stranger. In his masterly book on "Architectural Drawing" Mr. R. PHENÉ SPIERS gives the following account of the process:—

The most indefatigable sketcher of modern times (the late Mr. George Edmund Street, R.A.) used a book measuring 8 inches by 6½ inches, and invariably extended his drawing across the two pages. Long experience, possibly, enabled him to so place his drawing that the fold in the middle did not materially interfere either with the effect of the drawing as a whole, or the proper vanishing of his perspective lines. As he always drew freehand when sketching out of doors, *i.e.* without



CHURCH AT BRIGHTWALTHAM, WANTAGE, 1868.

with decision, and that the thinnest was expressive of some definite purpose. The success of his method of representing buildings is perhaps more evident from a comparison of the translated or engraved examples from his sketches, which appear in his books on Spain and Italy, with those from sketches by other artists. The superiority of Mr. STREET's will be evident at a glance, for in them we see that nothing was sacrificed for the sake of effect. From his mastery of every detail he was able to insure accuracy of form in a drawing, however small.

Mr. STREET's style can be considered as having as much correspondence with that "style coulant" which is prized in France as can arise between lines and words. His perspectives do not appear laboured, and they might be taken for hasty productions. But they could not be completed except by a hand that was delicate, assured and flexible, and guided by a mind that saw too clearly to become confused. Mr. STREET's perspectives corresponded with his powers and his knowledge, and in consequence they are not easily to be imitated.

It would be unwise to conclude this article without

the use of rule or compass, he contented himself with drawing only the leading lines, whether straight or curved, as cornices, string-courses, vertical shafts or arch mouldings, simply indicating the starting-point of the others, and leaving it to the eye to supply their continuation, the result being that the sketch is not overlaid; there is not a line in his drawings which could be spared, and no more is indicated than absolutely necessary to convey a full idea of the feature portrayed. Mr. Street not only discarded the use of instruments, but of indiarubber as well; the greatest care, therefore, had to be taken in the setting out of his sketch, and long practice and accuracy of eye enabled him to preserve the scale throughout in his drawings; his great knowledge of detail of every kind of Gothic work allowed him to grasp at once the characteristics of any feature, and to delineate it in the fewest possible lines. In all cases, when easily obtainable, Mr. Street noted the principal dimensions of the features he drew, whether sketched in perspective or geometrically.

It was Mr. STREET's conviction that the pen was the most fitting aid in the representation of buildings of a Mediæval type. His treatment of the style might have been altered if he made use of a pencil and colour. He had no desire to change his manner, but it must be said that the sight of a good coloured drawing of one of his buildings gave him pleasure that was surprising.

NEW EDINBURGH: SKYLINE.

By E. F. C. CLARKE.

TO those who, like the writer, knew the wonderful city and town of Edinburgh some thirty years ago, the growth of this picturesque city southwards, towards the Braid and Pentland Hills, cannot fail to prove a source of sincere admiration, and to the jaded eye of the wearied designer it is a really refreshing oasis in the general desert of confusion.

The great glacial or volcanic ridge, rising at Holyrood near the bottom of Canongate, crowned with towering grey gables and roofs, and culminating in the superb mass of the Castle Rock, with its bastions and ramparts grey in mist, smoke, sunshine and shadow, is known to all visitors who have eyes to see. Princes Street, commonplace and vulgar in itself, but noble by reason of what it looks upon—this street, with its wide valley underlying the vast mass of picturesque forms that soar into fine grey mist by day, and melt into countless clusters of twinkling lights by night—

the effect they were destined, by sheer accident as far as they were concerned, to produce. In truth it must be owned that much of the building about this region, viewed critically, is decidedly commonplace. The pseudo Italian debased Renaissance, the patent Scottish Baronial housemaid's turret, the playful and aggressive pinnacle—these are jumbled together in a manner which on flat ground would be decidedly distressing, and productive of nought but melancholy and depressing reflection. As a matter of fact—and skyline born of natural conformation of ground is the text of this brief notice—the general result of this new development of modern Edinburgh as seen against an early morning sky, or it may be a storm-cloud or a summer moon-rise, is simply a revelation. The whole composition is unmistakably beautiful and well worthy the artist's pencil. It is a perfect dream of finely-drawn grey mass against light, a subject that TURNER would have prized and noted and used on the instant.

Modern Edinburgh, like most other towns, has its quaint and curious incongruities. People are to be found who would dare to assail the gruesome grey squalor of a



defies Europe to find its peer. It may be at once assumed that varied contour of ground, combined with that individual effort that is characteristic of building in a free country, form the basis of most that is acceptable, and of much that is really beautiful in that one most important feature of architecture as viewed in the aggregate—"skyline," man's creation cutting the eternal sky, and being for ever ennobled by its association with the far beyond.

The extension of Edinburgh on its southward slopes from the great ridge is, curiously, a veritable second edition as it were of the wonders of the "Old Town," though different in character. The so-called "New Town," sloping down towards Granton and Leith, is widely known for its melancholy, dreary monotony, its precise sterility, and its appalling and unassailable respectability. But in the subject before us, the utilising of the falling ground dominating the region known as the Meadows and Bruntsfield Links, nature has, by reason of the undulation of the ground and its inevitable complement of clustering roofs and harmonious incidence against the luminous sky, come to the rescue of builders who can have thought but little of

Queen Street by the introduction of a palpably imported pink Gothic doll's-house, an erection that not only looks sorry for itself, but seems to wish it had not come there. The unrivalled and beautifully-kept Princes Street Gardens, in the valley between the Old and New Towns, are adorned with a huge cast-metal fountain (made in Germany?), on which may be seen, on days when the water company is in complacent humour, some twenty-four young ladies, all sea-sick at the same time. This fountain is a singularly emphatic triumph of inept, irresponsible vulgarity. Princes Street has long been "up" for the grand installation of electric light, which will doubtless, by its blatant nightly flare, extinguish at nightfall one of Edinburgh's most startling graces—that dreamy flicker of myriad points of burnished gold in the countless windows of the majestic old grey town across the valley. The scheme formulated some thirty years ago for piercing and probing the huge masses of sixteenth-century buildings in the Old Town, those lofty piles of endlessly beautiful crow-stepped and turreted structures that, in solemn and sombre grey, stood out so mysteriously against the ever-changing northern sky—those

plague-stricken fever-dens that were no longer habitable even by the waifs and strays that could exist under conditions quite unmentionable to polite ears—this scheme has been carried out, and, to the honour of the architects concerned in the work be it said, without materially impairing the general mystery and grandeur of the town called by the greatest of Scotsmen "the grey metropolis of the North." SCOTT has been blamed by pedants for this most happy, most apt, and most artistic description of a city that is

to the Edinburghians, and a terrible example to people who desire to tell transparent lies by the degradation of architecture. It is the artificial "ruin" of the suburban "rockery," and an eyesore to all beholders, even far out at sea. It was to have been a second Parthenon, presumably for sea gulls, but the funds failed, and probably the persons engaged in the ridiculous effort to create a second Acropolis became a little ashamed of the business, though had they possessed any feeling whatever for the credit of their town they would



always, and in every varied light of nature, sympathetically and mysteriously grey. As an instance of the undoubted success and fidelity to tradition with which the improvements in the Old Town have been effected, let anyone look from the east end of Princes Street straight up the North Bridge, and he will see a nobility of mass, contour and soaring skyline which will convince him that modern sanitary improvement is not incompatible with the preservation of true sentiment and real architectural dignity.

doubtless have changed their minds and carted away the stones of this hideous sham.

The region of ALLAN RAMSEY'S house—that superb consummation point of nature's design for the city of Edinburgh—where the great ridge of gabled houses abuts upon the Castle Esplanade, bristles with new red-tiled roofs and Queen Anne innovations, albeit with harmonious effect as seen towering above the green Castle slopes, and with noble skyline, thanks mainly to noble groundline.



This vista, striking the distant sky across the ridge that is the initial cause and origin of the grandeur of this unique town, is a study in itself, and is a mighty instance of what can be done in improving streets and dwellings when the keynote of the composition is touched by nature herself, and is faithfully regarded and followed by those on whose shoulders lies the responsibility of completing and ennobling the theme.

The "National Monument" on the Calton Hill still remains a disfigurement to the general skyline—a reproach

But new Edinburgh, as seen from the Bruntsfield Links in the soft light of an autumn afternoon, or at sun or moonrise, is something to be enjoyed, studied and thought about, for it is surely here that a most vaunted and undoubtedly a unique city has made an extension of its borders, that has not marred but has rather enhanced and emphasised its ancient glory as one of the most charming of creations, which cannot be once visited without receiving a lifelong impression

HISTORY OF THE TOWER BRIDGE.*

AT the time when the subject of the Tower Bridge was under consideration and there was a risk of narrowing it to a mere question of providing an additional roadway, regardless of the injury to the traffic on the river, we endeavoured to suggest the relations of the case and wrote as follows:—

It is recorded that when James I. threatened to punish the citizens of London by the removal of himself and his court to some other city, the Lord Mayor calmly informed the king of the hope of the citizens that His Majesty would leave them the Thames. So long as the river remained the people of London believed that they might endure the loss of even the Solomon of the West. Since that time much has been done by means of railways and improved roads to facilitate the intercourse of nations and to promote commerce, but the Thames is still what it was in the days of King James, the link by which London is united with the rest of the world. If, as Sir John Herschel says, "London is the centre of the terrene globe," that position is due to the possession of a navigable channel. What other city can show such a proof of international trade as may be witnessed every day in the year between London Bridge and Blackwall?

The supremacy of London in commerce is in a great measure attributed to the navigability of the river, and in dealing with the Thames this fact should be never overlooked. While everyone admits the advantage of unimpeded communication between the parts of the Metropolis on both sides of the river, it should also be remembered that an advantage of the kind would be dearly purchased if to secure it impediments were raised to interrupt the traffic on the water. The local requirements of Whitechapel and Bermondsey should never be allowed to override the general interest of the City (which is also the interest of England), and although it would be well for carts from Shoreditch to reach the Old Kent Road expeditiously, the gain in time would hardly compensate for the loss that is inevitable if commercial arrangements which have taken centuries to mature should be disturbed or destroyed.

When, for example, it is proposed to erect a bridge with a massive pier in the very middle of the waterway, or a bridge of a height that will prevent many of the vessels that trade with London from passing under it, or a bridge on so ingenious a principle that there is risk of the intricate machinery becoming disarranged in the opening or closing, it is evident that in every one of those cases there is a certainty of interference with the traffic of the Thames, and the trade of the port will in consequence be sacrificed to local interests. On the other hand, a fixed bridge at a high elevation above the river would involve local inconvenience, for it must be costly, and unless the approaches are carried for a great distance inwards, the gradients will be steep and involve a loss of tractive power.

If the foregoing assumptions are correct, it is evident that the question of constructing a bridge over the Thames below London Bridge is one in which compromise is demanded if there is to be a satisfactory solution. Something must be abated by all parties, by the representatives of land traffic as well as by the riverside proprietors. It is physically impossible to have a bridge with easy gradients for land traffic and which will be also clear above the highest masts, or one on a low level which shall still be equally convenient for ships and waggons; and the most prudent course will be to construct a bridge on a principle that will give a minimum of inconvenience while allowing of easy gradients and a capacious waterway.

A great many inhabitants of London were of opinion that there was opposition between metropolitan trade and the shipping industry. It seemed to them that, as the Metropolis grew, London Bridge should not be the last means of communication between two important regions, and that little harm would arise if vessels and large steamers were compelled to keep to a lower reach. There were others who believed that the trade which lies immediately to the east of London Bridge could be conducted by means of barges at an expense which would be insignificant if compared with the advantages arising from the existence of another bridge lower down, as accessible as London Bridge.

There were not only the powerful, if selfish, interests of metropolitan traders against an adequate solution of the problem, but the Metropolitan Board of Works were manœuvring to impede the action of the Corporation in the creation of such a bridge as was needed. The Board's engineer in 1878 prepared a design which "ignored or showed a thorough disregard of all the evidence, views, wishes and interests of the wharfingers and of shipowners trading between the site of the proposed bridge and London Bridge." Unfortunately the same sort of dog-in-the-manger

policy has been inherited by the London County Council, and the discreditable tactics by which the Tower Bridge is left without suitable approaches are evidence of the strength of the obstructive spirit in Spring Gardens. The Corporation, however, continued to study the subject in spite of the obstacles created by the Board. There were two classes of solutions, viz. a high-level bridge which would allow ships to pass under it, but which would need long approaches, or an opening bridge. In 1878 the City architect, the late Sir HORACE JONES, submitted a design for a bridge on the bascule principle, which had not been applied previously over so large a waterway. His bridge allowed of a low-level roadway for ordinary traffic. But, as happens with the majority of swing, rolling, sliding and other opening bridges, pedestrian traffic as well as traffic on wheels would have to be suspended while the bascules were raised to allow ships to pass. The principle was novel in this country. The Corporation hesitated, and the architect's design was set aside for a time.

The discontent which arose mainly from the inadequacy of London Bridge increased every year. At the end of 1883 the Board of Works, taking advantage of the state of feeling on the subject, lodged their Thames Crossing Bill. A Bill for a Tower Bridge was also lodged by a company, and one relating to steam ferries by the Corporation. The recommendation of the Parliamentary Committee that considered the Bills, in July 1884, was that a subway should be constructed at or near Shadwell, and a low-level bridge at Little Tower Hill, with two openings, each about 100 feet wide, to be spanned by a pivot swing-bridge. The Corporation loyally endeavoured to carry out the committee's report. A deputation at once visited Belgium and Holland to consider the various types of swing-bridges. Reports, designs and estimates were afterwards prepared. By the end of the year the former proposal of the City architect appeared more feasible, and accordingly a Bill was lodged seeking powers for the construction of the Tower Bridge. HORACE JONES had prepared three designs; two were for a swing-bridge, the difference between them being in the character of the towers, while the third, which he preferred, was for a bascule bridge. The principal opponents of the Bill were the wharfingers, who were apprehensive about their interests while the bridge was in progress. Arrangements to satisfy them were agreed on, and the Bill was passed on August 14, 1885. Nine months afterwards the works were commenced, the contract for the foundations, with the piers and abutments for a height of 4 feet, having been taken by Mr. J. JACKSON, of Westminster, who is about to receive the well-deserved distinction of knighthood. The amount was £131,344.

The design for the Britannia Bridge over the Menai Straits would never have received the sanction of Parliament if STEPHENSON had not introduced several chains to uphold the rectangular tubes. The design which HORACE JONES prepared appeared to be intended to overcome a fear of that kind, as if some Parliamentary engineer had gone over the drawings. The bascules were tied by chains to a great semicircular arch, which was in its turn tied to the towers, and the chains were finally carried to the ground. Counsel could declare to the committee that the Tower Bridge possessed all the stability that a combination of girders, arches, suspension-bridges and towers could confer. Afterwards the arch was removed, an upper footway for pedestrians was introduced, but the design submitted to Parliament displayed a more cumbrous structure than now crosses the Thames.

Sir HORACE JONES evidently desired to impart more architectural character to the Tower Bridge than is visible in the bridges which are of later date than the Waterloo Bridge. His piers were not only made to resemble feudal keeps, in order to correspond with the Tower of London, but they were to be able to withstand all the direct and indirect strains of the chains, arch and girders, with their loads. When the limited area fixed for each pier (185 feet by 70 feet) by the Conservators of the Thames is remembered, it may be doubted whether they possessed the mass which would be requisite to counteract such great strains. The towers would no doubt serve to sustain a Mediæval drawbridge with its load of knights, squires and men-at-arms; but the unromantic traffic of London is heavier than a company of plumed warriors in armour.

* *History of the Tower Bridge and of Other Bridges Over the Thames Built by the Corporation of London*, including an Account of the Bridge House Trust from the Twelfth Century, based on the Records of the Bridge House Estates Committee, by Charles Welch, F.S.A., Librarian to the Corporation of London, with a Description of the Tower Bridge by J. Wolfe Barry, C.B., M.Inst.C.E., Engineer to the Bridge, and an Introduction by the Rev. Canon Benham, B.D., F.S.A. Prepared under the direction of the Bridge House Estates Committee (Sir Albert J. Altman, chairman). Smith, Elder & Co.

Mr. WOLFE BARRY, who was associated with the City architect during the passage of the Bill through Parliament, and who has had the sole responsibility for the erection of the bridge, was compelled to take a prosaic view of the requirements. He dare not rely on the masonry for affording operative strength, so he made the best of the case by allowing it an ornamental office, viz. to screen the iron and steel which are the efficient agents. Mr. WOLFE BARRY offers the following explanation of the system he adopted:—

It became apparent that it would not be possible to support the weight of the bridge on towers wholly of masonry, as in the first designs, unless they were made of great size and unnecessary weight. It was consequently requisite that the main supports should be of iron or steel, which could, however, be surmounted by masonry so as to retain the architectural character of the whole structure.

It was clear that in any event a large part of the steelwork of the towers must be enclosed in some material, for the moving quadrants project upwards some 40 feet from the level of the roadway, while the stairs and lifts also required protection from the weather. It thus became a question of surrounding the towers either with cast-iron panelling or with stone, and eventually a granite facing with Portland stone dressings was adopted.

Esthetically speaking, stone appears better than cast-iron, which would equally hide the constructive features, and, practically speaking, it is also better when it is considered that there is no mode so satisfactory for preserving iron or steel from corrosion as embedding it in brickwork, concrete, or masonry. Careful provision has been made in all parts for expansion and contraction of the two materials, and

a distance of 148 feet 8 inches within the pier. Mr. WOLFE BARRY gives ample information about their construction. Each of the bascule girders has a total length of 162 feet 3 inches; the pivot on which it turns is 112 feet 9 inches from one end. The weight of the longer arm is 424 tons and of the shorter 621 tons. The opening span can be moved from a horizontal to a vertical position in one and a half minutes, and a similar time is required for stopping the road traffic and clearing the bridge. The ascent or descent of a lift in the tower through a height of 110 feet occupies one and a half minutes. It would be impossible to have so much expedition without the perfected hydraulic machinery which is associated with the name of Lord ARMSTRONG. The economy of water-power is suggested by the following passage:—

The pumps are on the Surrey side of the river, and are placed in arches under the south approach. The high-pressure water is brought thence in pipes along the Surrey fixed span, up the Surrey tower, across the high-level footbridge and down the Middlesex tower. Return pipes convey the water—when it has exerted its pressure at the hydraulic engines, which are fixed below the footway on each pier—back again to the pumps at the steam-engines, where it is subjected to pressure, and made ready for work again.

There is so much motion that the Tower Bridge may be regarded as a great machine, and it presents dynamic as well as static problems to all who care to study them.



ERECTION OF TOWERS AND CANTILEVERS.

though there have been great extremes of heat and cold since the masonry has been built, no effects resulting from any difference of temperature have been observed.

It is to be feared some purists will say that the lamp of truth has been sadly neglected in this combination of materials, and that the architects of Classical or Mediæval times would not have sanctioned such an arrangement as a complex structure of steel surrounded by stone.

One reason may be that the architects of those ages did not know much about iron or steel. Perhaps if they had been acquainted with their capabilities they might have been as ready to employ them as they were to back up stone-faced walls with brick and to hide the constructive features of their buildings, as Sir Christopher Wren did when he used a brick cone to support the internal and external domes of St. Paul's.

However all this may be, "needs must when Parliament drives," and if the appearance of the Tower Bridge is approved, we may forget that the towers have skeletons as much concealed as that of the human body, of which we do not think when we contemplate examples of manly or feminine beauty.

The piers are also "very complex structures," for they have not only to sustain the weights of the towers and girders, but they cannot have solidity. There are hollow chambers in them to allow the motion of the bascules, and others for hydraulic accumulators, hydraulic engines, &c. On one line of section where the length of the pier is 185 feet, it is possible to walk continuously through

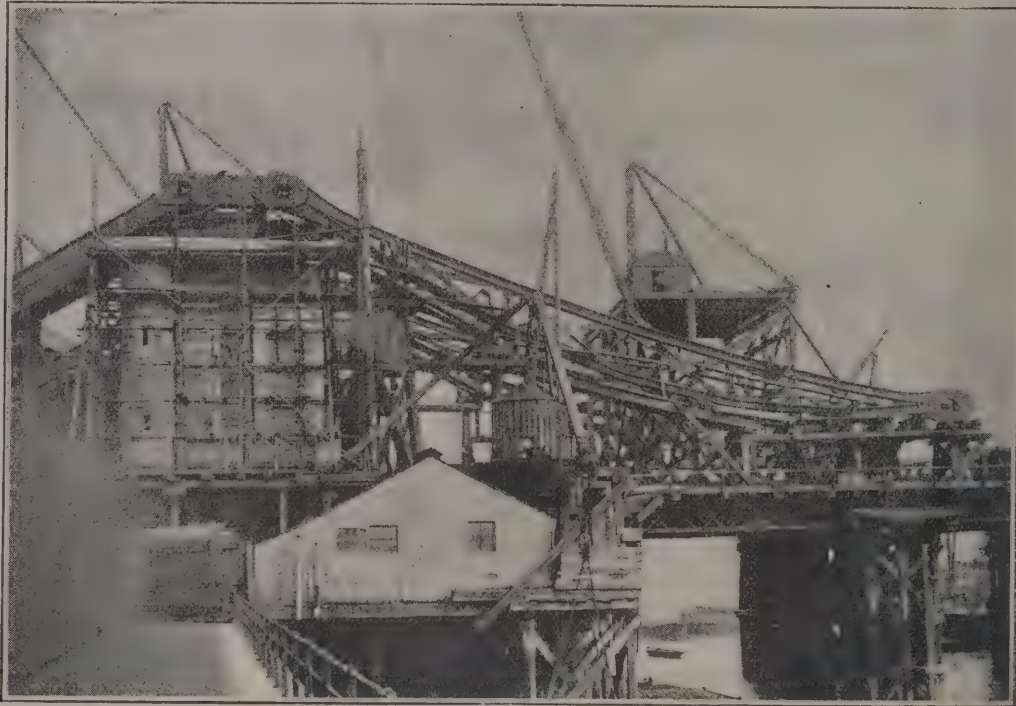
The construction of the bridge was as fine an example of organisation as can be discovered in the history of English contracting. The size of the staging in the river was limited by the Act, and the Conservators of the Thames insisted on a clear waterway of 160 feet in width. It was, therefore, impossible to construct more than one pier at a time, and there could be only one staging at a time, of the full width required for building the piers.

It will be observed from one of the views that each tower has four wrought-steel pillars which are octagonal on plan. They are united by horizontal girders, which serve to carry landings, floors, &c., and stiffened by diagonal bracing. On the tops of the pillars are rollers, which allow the chains passing over them to have such motion as may arise from expansion or contraction, or the unequal distribution of loads on the roadway. The rollers are excellently arranged in order to avoid the possibility of a concentration of weight on one or two of them. The chains are not like those used in suspension bridges; "they are, in fact, chains stiffened to prevent deflection, and the object of the form is to distribute the local loads due to passing traffic, which, in the case of an ordinary suspension bridge, depress each part of the chain as the load passes, and consequently distort the platform of the bridge. By making the chain, as

it were, double, and bracing it with iron triangulations, these local deflections are avoided."

The high-level bridges for foot passengers at top of structure are also interesting on account of the manner of erecting them. The span of each is 230 feet, but owing to restriction of keeping an open waterway it was necessary

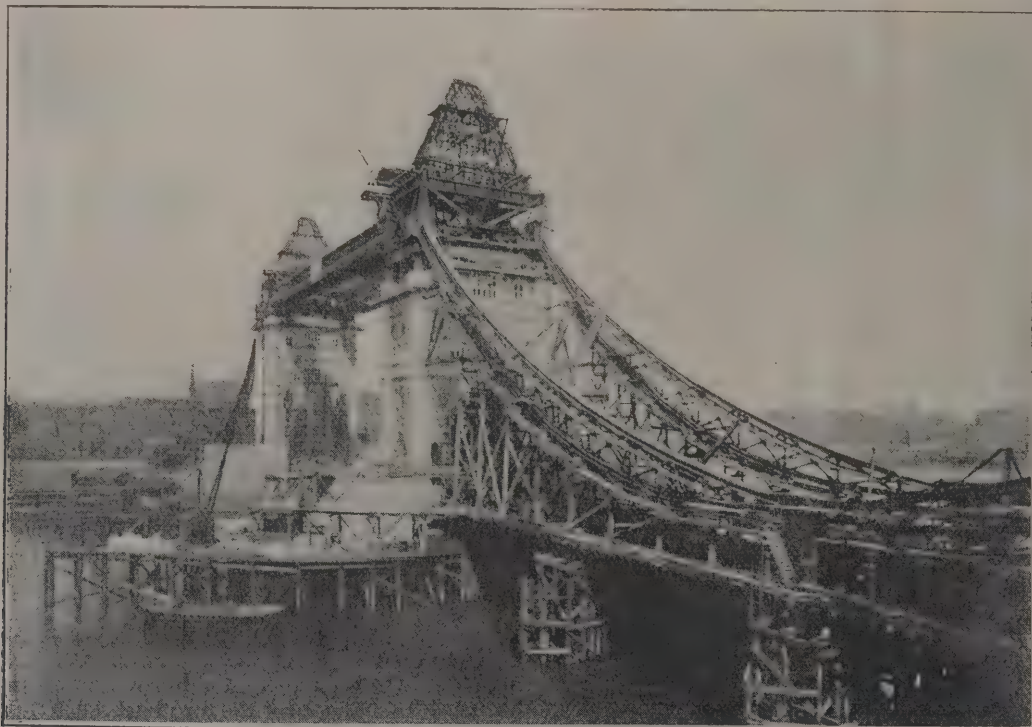
the work to the most experienced contractors that could be discovered, and allowed the engineer the fullest authority. If the amateurs of Spring Gardens could have got hold of such an undertaking a very different result must have followed, for the whole affair would be manipulated for the glorification of a party of the members, and to bring odium



ERECTION OF MAIN CHAINS.—I.

to dispense with scaffolding. "These bridges," says Mr. WOLFE BARRY, "are cantilevers for a distance from each tower of 55 feet, and are girders for the remaining space of 120 feet between the ends of the cantilevers. They were erected, however, by temporary expedients entirely as cantilevers, piece by piece from the tops of the towers and with-

on some class or other of the inhabitants of the Metropolis. There is cause for congratulation that instead of a costly fiasco like the economical experiments in construction of the Council, London has gained a bridge of which every inhabitant should be proud, and one that, like London Bridge, Southwark Bridge, Blackfriars Bridge and the



ERECTION OF MAIN CHAINS.—II.

out scaffolding from below, for the whole of the semi-span of 115 feet, till they met over the centre of the river." The steelwork was carried out by Sir WILLIAM ARROL & Co., and is no less creditable to them than the more extensive work at the Forth Bridge.

The success of the bridge is owing to the fact that the Corporation, according to their usual practice, entrusted

Holborn Viaduct, is a memorial of the prudent government of the Corporation of London. Mr. WELCH'S history contains much that is most interesting about the earlier engineering works of the City, but we are compelled to postpone our notice of that part until next week. Meanwhile, we can say that the "History of the Tower Bridge" is as fascinating for the antiquary as for the engineer.

PRESERVATION OF ANCIENT PAINTINGS.*

Translated from the Italian by JOHN HEBB.

IN the endeavour to preserve ancient paintings one is confronted by a dilemma which, although it may assume various forms, is always the same—whether to leave them to perish of themselves, or to hand over this important portion of the heritage of the nation to the power of the restorer.

But now restorers, with certain exceptions, are unfortunately quite empirical, entirely devoid of the most elementary knowledge of chemistry, distinctly disposed to apply their formulas to differing cases and conditions, and so intent on occupying themselves above all things with the appearance of the restoration at the moment of completion, as to justify the apprehension which every connoisseur of ancient pictorial art experiences when paintings are placed in their hands.

Nowadays we no longer restore, we preserve, and it certainly was a great step in advance to have induced the conviction that the authenticity of paintings, as well as of every other work of art, is a fundamental condition of their intrinsic value; that the tone of paintings by time attests their antiquity as well as adding a harmony of a more elevated order than the hand of man alone can bestow, at the same time contributing to and differentiating the methods peculiar to every age and every great school of painting.

We begin, on the other hand, to tread upon unknown or at least uncertain ground, when we attempt to choose the most appropriate means for the preservation of paintings, if our choice be made under the influence of an empiricism discordant in every particular except its superficiality, or in the insufficient duration of experiments on the methods to be adopted. This superficial empiricism occasions that blackening which is generally characteristic of the work of all restorers, and the final recognition on the part of experts that ancient paintings, when treated by various methods opposed to one another, are frequently ruined.

When an ancient painting is in danger of being lost, by the colour drying and becoming detached, a repairer is called in, who is instructed, for instance, to confine himself to fixing the colour, that is to say, to carry into effect the most severe precepts for the preservation of ancient buildings; but here begins an entirely new series of dangers to which the painting is exposed through the means adopted to repair it. It is too often the case that on this account many ancient paintings are entirely ruined, or their old defects reappear with accelerated rapidity, while other paintings are destroyed by the loss of the characteristic qualities attributable to the nature of the materials used by the artist, or are exposed to periodic repetitions of partial obscuration and other evils, for which it is necessary to provide a further remedy in addition to that which would have at first sufficed.

The inexhaustible and varying recipes of restorers have converted frescoes into encaustic or tempera paintings, caused dry distemper to disappear under greasy varnish, and mummified at other times oil-paintings with resinous gums. Sometimes the glue laid on a mural painting will give cohesion to the colour for a year or so, but this afterwards hardens, and splits off in a myriad of minute scales, which curl up and fall like autumn leaves, leaving the plastering bare; sometimes the mysterious recipes lead to disastrous and unexpected results, induced by mixtures which even the restorer himself was unacquainted with, applied to paintings of which he had not studied the nature, or under conditions which he was not in a position to investigate or appreciate.

All this demonstrates the necessity and urgency of regulating the work of restorers or repairers of ancient paintings; but in order to so regulate it is necessary to collect and tabulate the result of investigations made up to the present time on the handling and technique of particular kinds of painting, the alterations they may have undergone and the mischiefs occasioned in respect of their material composition by atmospheric influences or accidental injury; and, in addition, as to the means best adapted to repair the different kinds of damage occasioned to ancient paintings and to remove or diminish the cause of further mischief.

The following prize competition has for its object the arrangement and perfecting of the researches made up to now on the various methods of painting, in order that they may serve as a preliminary for further investigations.

The Minister of Public Education, with the view of procuring the necessary materials for the study of the principal problems relating to the preservation of ancient paintings, has instituted a competition for an essay on the technique of painting, setting out and completing as far as possible the useful results of the inquiries made up to date as to the materials and methods used in the production of the various kinds of painting, including fresco, encaustic, distemper, oil-painting on wood panels, on canvas, &c.

* Extract from the Italian Official Gazette, Office of Public Education, Department for Ancient Buildings and Art Schools.

The essays, which should be sent in not later than June 30, 1895, will be adjudicated upon by the Central Commission of Fine Art, assisted in certain circumstances by specialists capable of judging of their scientific value.

The author of the selected manuscript will receive a prize of 3,000 lire (120*l.* sterling).

G. BACCELLI,

The Minister.

Rome: November 1, 1894.

AN ADORNMENT LEAGUE.

THE Americans have leagues of many kinds, good, bad and indifferent, but it may be doubted if there is one that is better worth imitating than the League for the Adornment of the city of Chicago, of which the following are the rules:—

Article I.—The name of this organisation shall be the "Chicago Municipal Improvement League."

Article II.—The purpose of this League shall be to secure for our city such an arrangement, design and adornment of our public buildings and grounds, streets, boulevards and other public works as shall most contribute to the convenience and enjoyment of the public, stimulate an appreciation of art, and give to the city a fixed expression of its greatness.

Article III.—This League shall be a union of committees, of three each, elected or appointed by such organisations interested in the above objects as shall respond to the invitation of this League. The following organisations are represented in the formation of this League and are hereby invited to continue their co-operation by making their committees standing committees for this purpose, viz. The Illinois Chapter of the American Institute of Architects, Western Society of Engineers, Chicago Society of Artists, Chicago Real Estate Board, Chicago Builders and Traders' Exchange and the Civic Federation of Chicago. Other organisations may be invited to co-operate with this League by a two-thirds vote of the whole number of members.

Article IV.—Each committee of three, appointed by a co-operating organisation, shall be a standing committee of this League on the subjects that come within the scope of the organisation which it represents. Each committee will serve as a means of communication between this League and the organisation which it represents. No action of this League is to be binding in any way upon the co-operating organisations, but is to be advisory only.

Each committee shall have a chairman elected by itself or the organisation appointing it.

Article V.—The chairmen of the several standing committees shall constitute the Board of Directors.

Article VI.—The following officers shall be elected by the Board of Directors from their own number—a president, vice-president, a secretary and a treasurer.

Article VII.—All officers shall be elected immediately after the annual meeting by a majority ballot vote of the directors present. Officers shall be elected for a term of one year and until their successors have qualified.

Article VIII.—It shall be the duty of the Board of Directors to have general charge of the work of the League, referring special investigations to the appropriate standing committees. All expenditure of money shall be under the control of the Board of Directors, who shall devise and carry out means for raising the necessary funds.

Article IX.—The annual meeting shall be held on the second Tuesday of November, at which time the several committees shall announce their selection of members for the Board of Directors.

Other meetings may be held on the call of the President or the Board of Directors. The President shall call a meeting on the request of any five members. Co-operating organisations are requested to appoint their committees during the month of October, so that the change of membership may take place at the annual meeting, at which time reports shall be presented by all these committees. These reports shall be sent to all co-operating organisations.

Article X.—A majority of the League or any committee shall constitute a quorum.

Article XI.—This constitution may be amended at an annual meeting without previous notice, or at a special meeting upon notice of proposed amendments at least one week in advance, by a vote of two-thirds of the total number of members.

Article XII.—The officers elected at the organisation of the League shall hold office until November, 1895.

A Roman Milestone which was found near Carlisle has been acquired for the museum of the city. It formerly stood on the Roman road leading from Luguwallium southwards to York, and bears the name of Carausius, the usurper of the Empire in Britain between 287 and 293. This is the first inscription of Carausius ever found, but his coins are common.

NOTES AND COMMENTS.

THE decoration of St. Paul's was an enterprise which for a long time was considered as never likely to be effectively undertaken until the millennium was approaching. Since the subject was mooted there never was so earnest endeavour to grapple with the difficulties as can now be witnessed. For the decoration of the choir the Chapter have become responsible, and they have found a competent director in Mr. W. B. RICHMOND. But as we pointed out when the mosaics were unveiled, the work is not of a character which can be appreciated by all people. To attain that end a scene-painter would be the most eligible artist, for he can gauge the requirements of the public and present figures which, if striking, are simple. The authorities of St. Paul's wish to have a sort of pictorial Scriptures which will need some skill in hermeneutics before they can be appreciated. They have many precedents for selecting subjects that are mysterious in their symbolism. Judging by what we have seen of the effect produced by the mosaics on ordinary visitors, we imagine that curiosity is excited, which will lead to inquiry, and that irreverence seems to be subdued. That amount of success is worth much in a time like the present. Mr. W. WOODWARD, who possesses a stock of remedies for all evils connected with building, is of opinion that the cathedral authorities are in the wrong, that "there has been a most unfortunate waste of money, and as regards the progress of English art the result is degrading in the extreme." The only proper course, according to Mr. WOODWARD, would be to apply to the artist who decorated St. Annunziata, Genoa, for a scheme. Mr. WOODWARD anticipates that the cupola would then be adorned with enriched concentric bands, and without a single figure. Marbles and mosaics would be seen in the transepts and nave, with sculpture in the parts near the eye, but the surface figure-work would be very sparse. What is proposed by Mr. WOODWARD might be most excellent, but there would be nothing ecclesiastical about it. The decoration would be a perpetuation of the secular character which the church possesses, only it would be in colour instead of a stained white, as at present. The Chapter, if enough money can be raised, will provide sermons in stones for future generations, and if they are of use in any place it ought to be in the Cathedral of London. If architecture should appear in consequence to be subservient to minor arts, the result will express the belief that prevailed in our time.

THE eighteen prizes have been awarded in the competition for the Paris International Exhibition of 1900. The three of 6,000 frs. each are obtained by MM. GIRAULT, HÉNARD, PAULIN. The four prizes of 4,000 frs. each were won by MM. LARCHE & NACHON, CASSIEN BERNARD & COUSIN, RAULIN, GAUTHIER. The winners of the five prizes of 2,000 frs. are MM. TRONCHET & REY, ESQUIÉ, TOUDOIRE & PRADETTE, BLAVETTE, SORTAIS. Finally the six prizes of 1,000 frs. are gained by MM. BONNIER, LOUVET & VARCOLLIER, MASSON-DESTOURBET, HERMANT, MEWÉS, DE TAVERNIER & THOMAS. The eighteen designs have been handed over to MM. ALFRED PICARD & BOUVARD, who will endeavour to evolve out of them a definite plan for the exhibition. They will have the assistance of a report by M. GUADET on the advantages and defects of each of the premiated designs. Whether one or more of the competitors who have gained prizes will be entrusted with the execution of the works cannot be known for about six months. The Parisians are satisfied with the competition, for the designs were suggestive of a remarkable exhibition and one which cannot be easily exhausted, for there will be buildings on both sides of the Seine, and the river is also utilised. As was anticipated, the majority of the competitors were in favour of retaining the Eiffel Tower.

THE science of acoustics is obscure, and its application to buildings is often bewildering. An American architect, Mr. E. G. LIND, of Baltimore, has announced some empiric rules which he says were successful, although his conclusions may horrify lovers of the science from their simplicity. The Boston Music Hall, it appears, is a perfect specimen, and

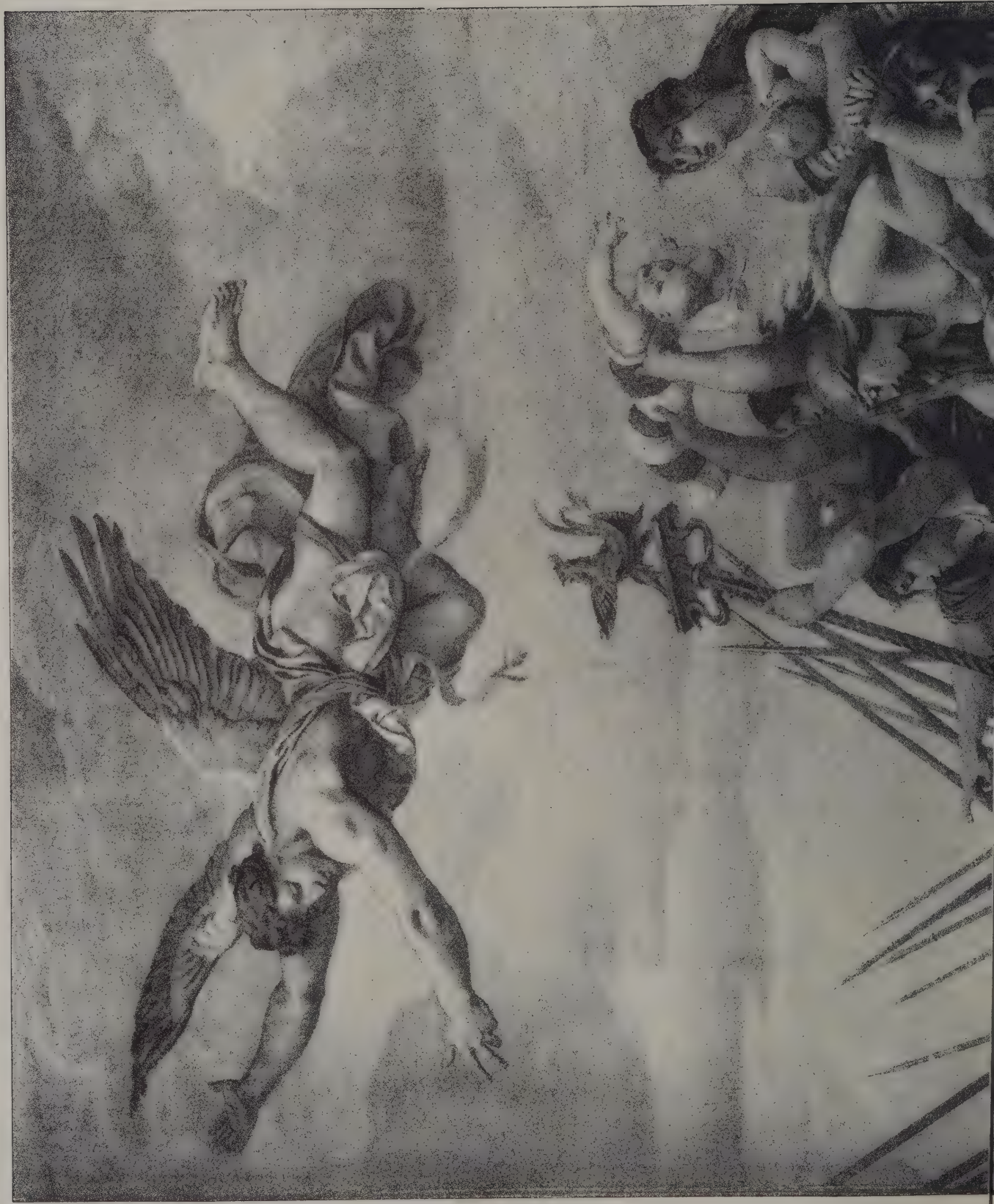
the dimensions are multiples of a number that is not appreciated, viz. 13. The hall is 130 feet long, 78 feet wide and 65 feet high. Knowing the success of the Boston Hall, Mr. LIND resolved, when laying out a Masonic Temple in Baltimore, to employ the same multiple. He therefore made it 104 feet long, 91 feet wide and 39 feet high. As a concert hall it was successful, but when a lecturer appeared it was a failure, owing to its resonance. The old Steinway Hall, in New York, in which 13 was not exactly applied, for the size was 120 feet by 75 feet by 42 feet, was not a triumph. In the Concordia Hall, Baltimore, 10 was selected as the multiple, but without any acoustic advantage. Mr. LIND, having faith in odd numbers, like RORY O'MORE, resolved to try some experiments with the number 7. When he had to build a Presbyterian church in Georgia he accordingly laid it out with a length of 70 feet, a width of 63 feet and a height of 35 feet. Hundreds of divines, it appears, have borne testimony that it is not surpassed for the excellence of its acoustic qualities. In a smaller church Mr. LIND also adopted the same number, and once more he was successful. The First Presbyterian Church of Baltimore, which is also esteemed by preachers, is 70 feet long, 63 feet wide and 63 feet high. The Cincinnati Music Hall is from 1 foot to 3 feet in excess of a correct application of the number which may arise from defective rods, for it measures 402 feet in length, instead of 399 feet, 316 feet in width (315 feet), and 150 feet (147 feet) in height, but the deviations do not disturb the power of sound. Mr. LIND has the candour to say that the acoustic qualities of a room may be influenced in great measure by the materials of which it is constructed, the arrangement of its various parts, the heating and ventilation; but until a more fortunate number is discovered, he pins his faith on 7 as a multiple, and many ancient and modern mystics would approve of his choice.

FRENCH thieves are agile and ingenious, but it could hardly be expected that any of them would be able to carry off about twenty statuettes from the exterior of a cathedral. A deed of that kind may now be entered in the records of the cathedral of Rouen. The figures stood at a height of nearly two hundred feet on the south side, facing the place known as the Calende. It is supposed that five or six men must have co-operated in the robbery, and it seems marvellous that they were undisturbed by police or people. The figures were purchased by one of the inhabitants of Rouen, and will therefore be replaced in their former position, but there is no clue at present to the vendors.

THE value of municipal records appears to increase as time advances, and their preservation is a duty which corporations should be proud to discharge. Exeter possesses charters and deeds some of which have more than local importance, but there is no muniment-room that deserves the name. The estates committee of the City Council lately investigated the subject, and came to the conclusion that a repository of the kind was needed, but it would be time enough to construct one whenever Municipal Buildings are erected. A conclusion of that kind meant an indefinite postponement of the subject. It did not find favour with a majority of the Council, for it was decided to erect a building behind the Guildhall in which the old records could be safely placed.

THE "Year's Art" for 1895 contains portraits of several artists and amateurs, whose names are known from their etchings and drawings in journals. Mr. WHISTLER appears on the frontispiece. In addition to information corresponding with what is to be found in the preceding volumes, there is a list of about three hundred collectors and a few pages about foreign art institutions and exhibitions which will be held during this year. The legal cases are brought up to December. The list of British artists now contains nearly 6,000 names, the majority being exhibitors. The new volume does credit to Mr. CARTER'S editing.

The Architect, Jan. 4th 1895.





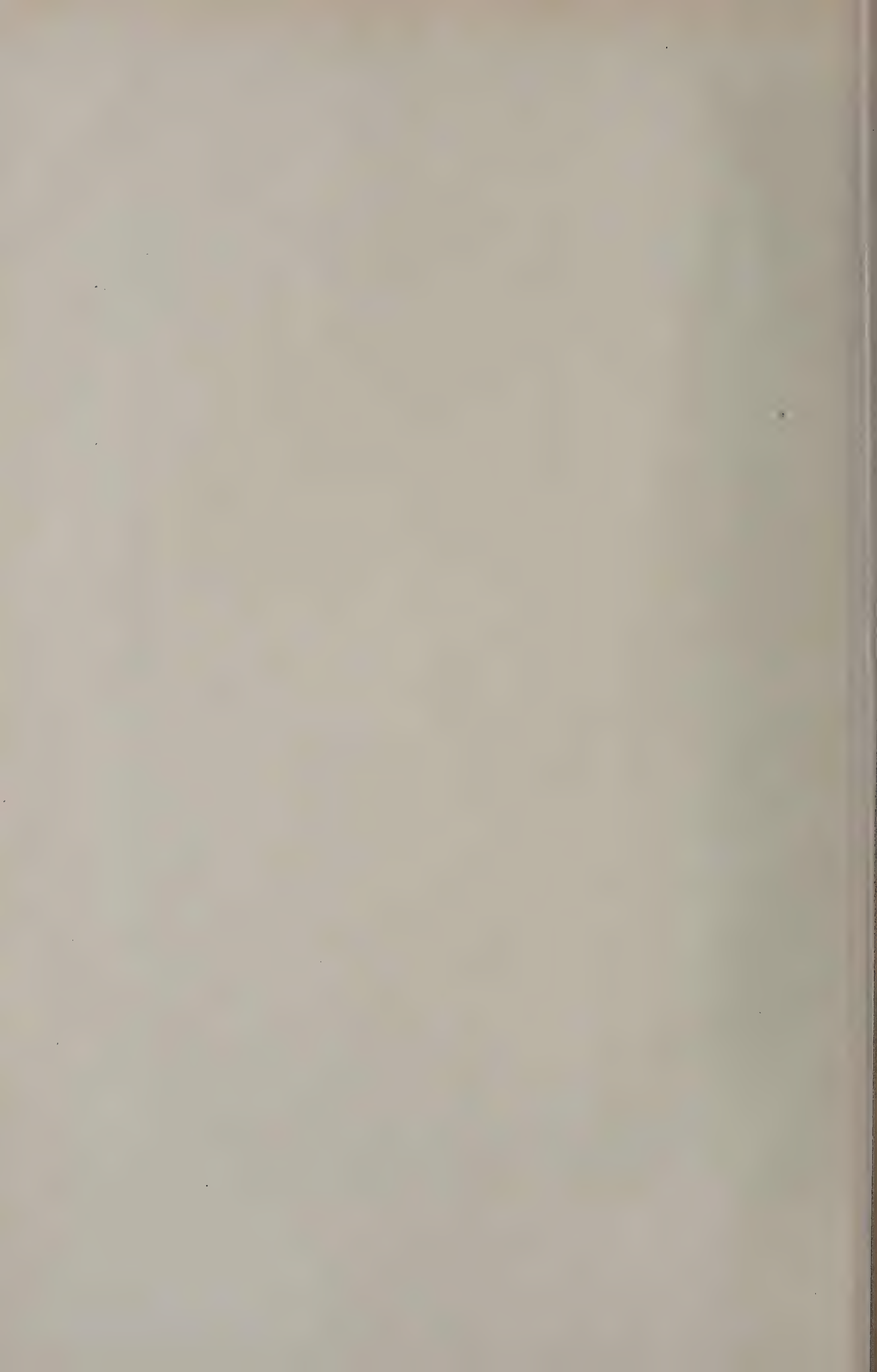
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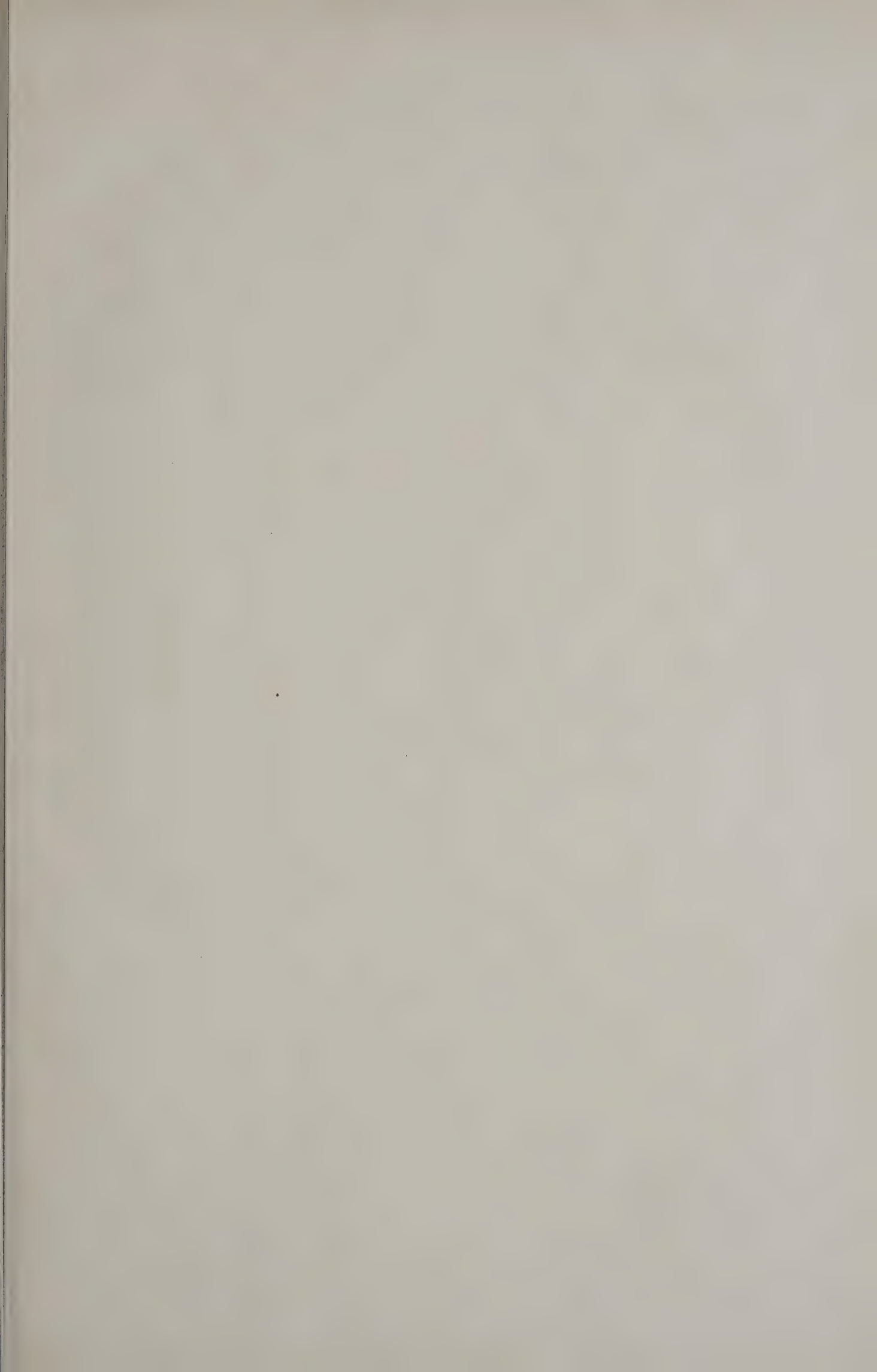
THE HISTORY OF CLOVIS, No 1.

YOW ON BATTLE FIELD OF TOLBIAC.

FROM THE WALL PAINTING IN THE PANTHÉON PARIS

BY JOSEPH BLANC.







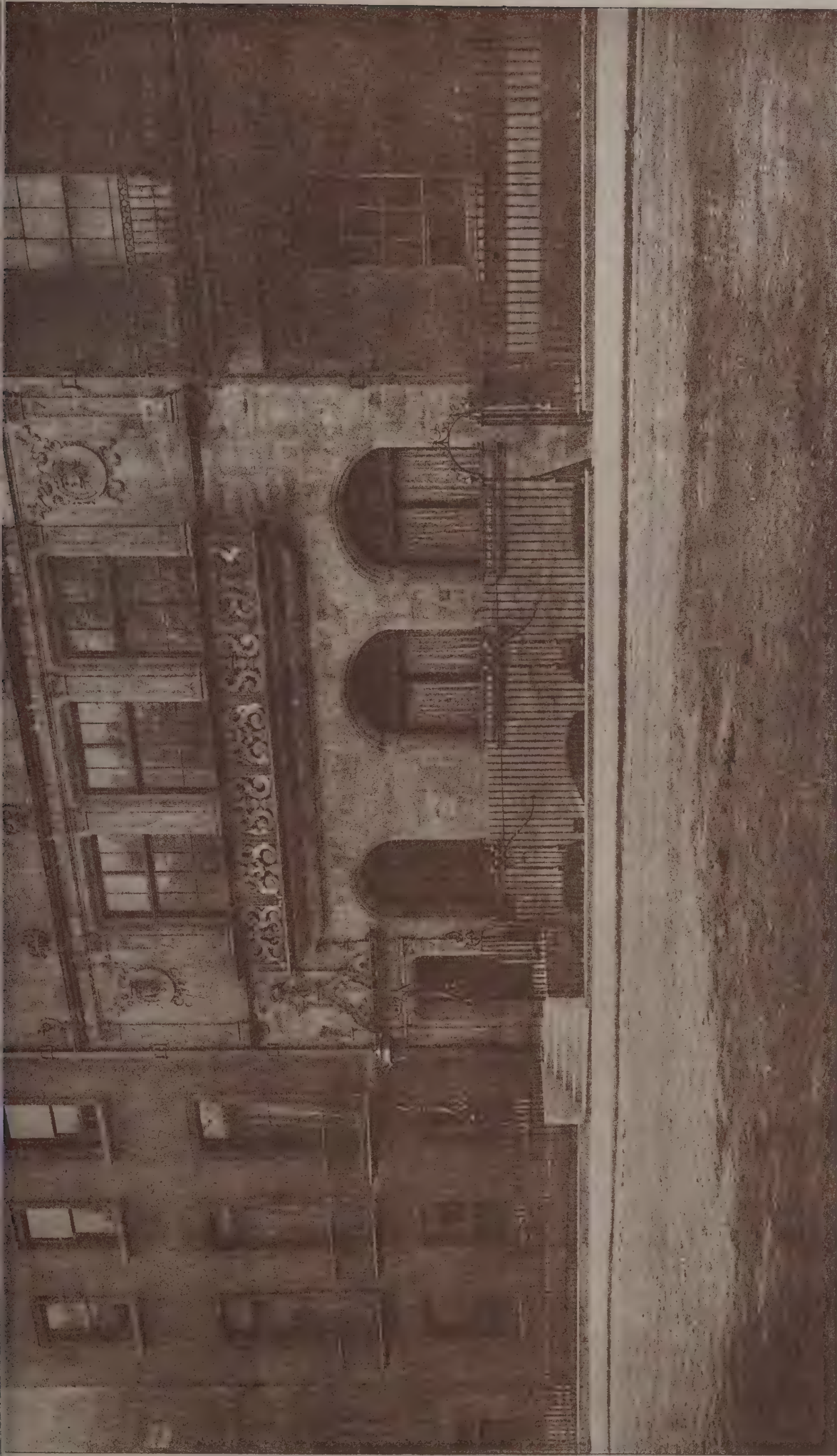


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PRUDENTIAL ASSURANCE BUILDINGS, NOTTINGHAM.
A. WATERHOUSE, R.A., Architect.

Öhr. Åreghert, Jan. 4th 1895.

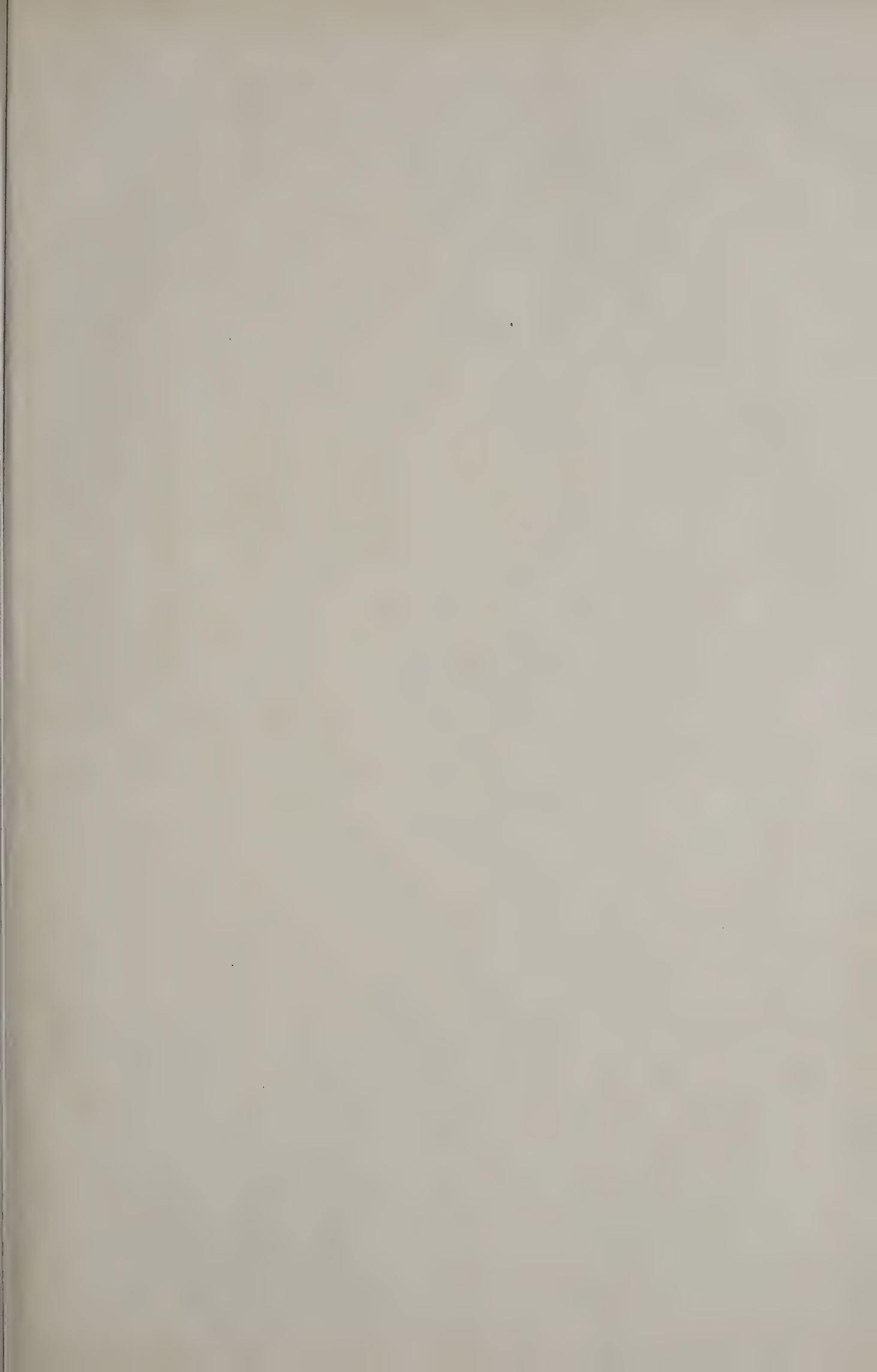


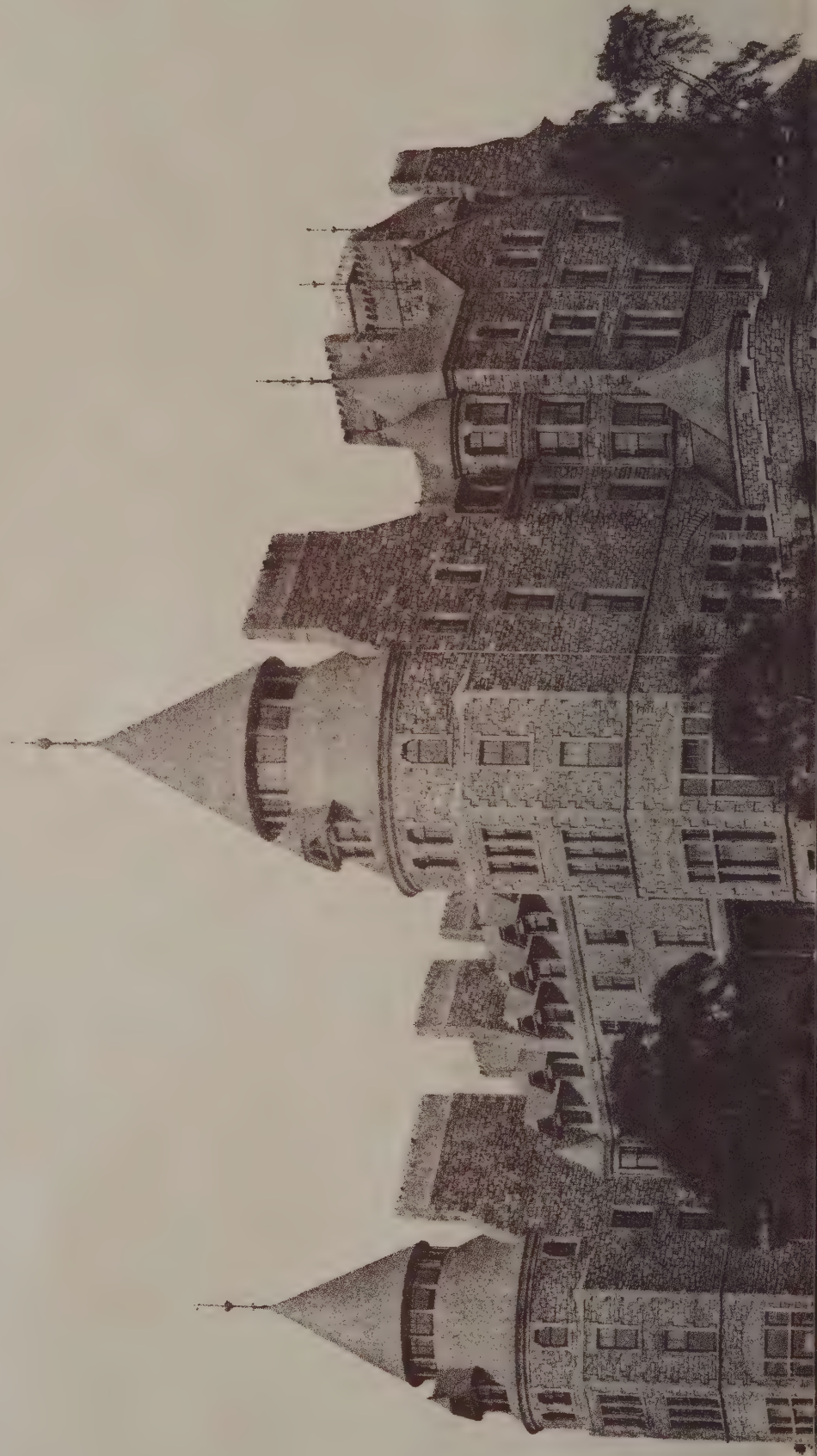


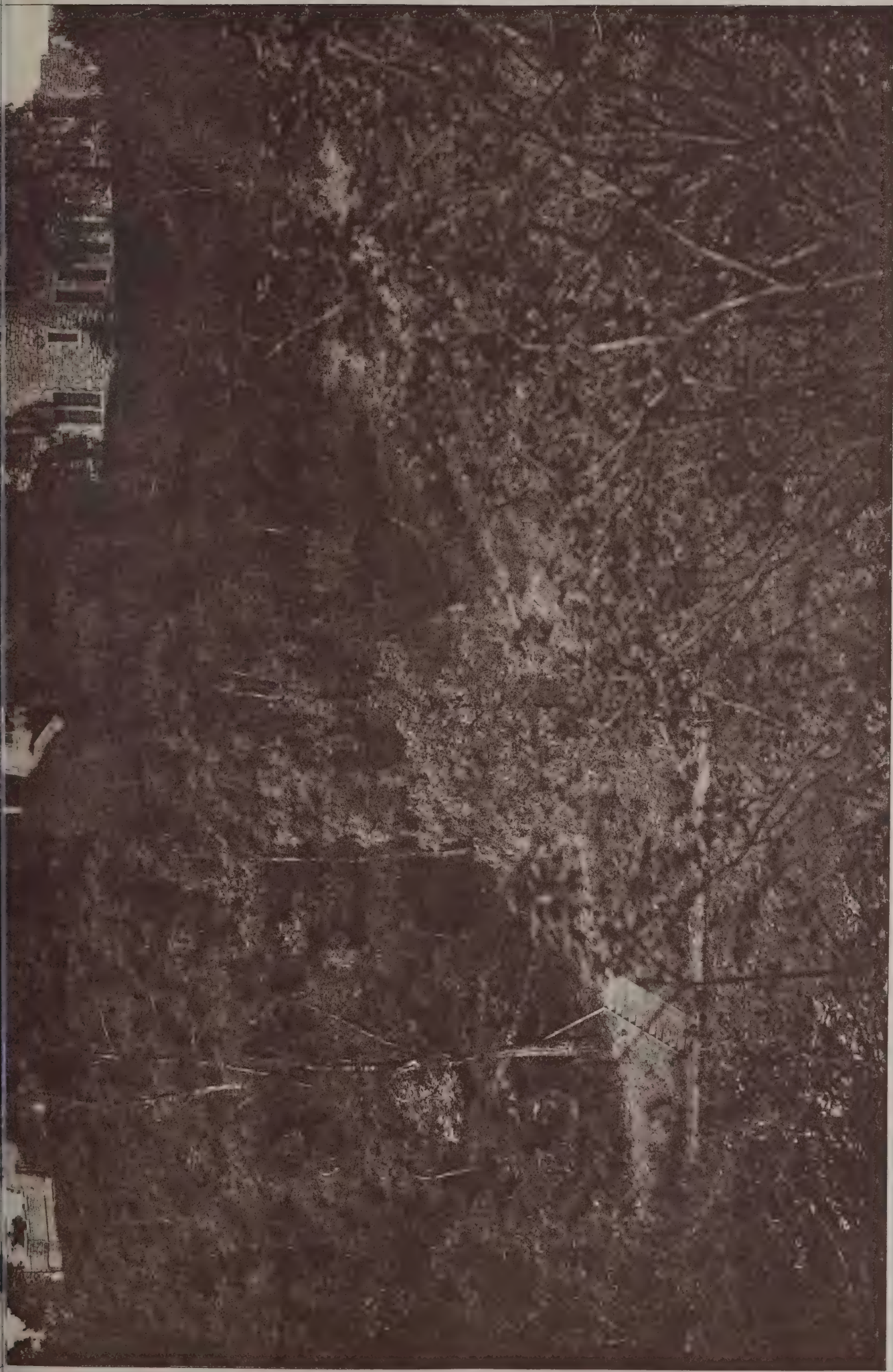
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40 BERKELEY SQUARE, W.
Messrs. ERNEST GEORGE & PETO, Architects







INK PHOTO SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.S.

ATHOLE HYDROPATHIC, PITLOCHRY
The Late ANDREW HEITON, Architect.

ILLUSTRATIONS.

HISTORY OF CLOVIS.—NO. 1.—VOW ON BATTLE-FIELD OF
TOLBIAC.

THE prints we have already published after the wall-paintings in the Panthéon of Paris reveal the peculiar Church and State character of the series. It might be supposed there was anticipation of a coming time when the building would be once more used for religious services, and the paintings were accordingly treated in a manner which would gain tolerance for them from the ecclesiastical authorities. The works relating to CLOVIS, of which we publish the first to-day, have the same sort of dualism. Three of the panels are furious battle-pieces, but angels may be said to take part as guides in them, and the end of the struggle is shown to have been attained in the baptism of the chief, which was followed by the acceptance of Christianity by his followers.

As CLOVIS was a Frank, who conquered a German tribe at Tolbiac, it is assumed at the present time that he was an ideal Frenchman, who merits to be taken as a model for imitation by the youth and manhood of France. It is ignored that he was a German, and that the battle of Tolbiac, where he commanded, instead of being a contest of patriots, with the Gallic cock for a standard, against the enemies of their country, was simply an endeavour of one horde of wild invaders to turn back another horde, in order to limit the numbers among whom the spoils of Gaul were to be divided. The identity of the Franks with the Germans has been accepted by the foremost historians of France. GUIZOT, for example, relates that in the fourth century some members of the tribes in Germany, among others the Franks and Saxons, made a step forward in civilisation and became agriculturists, while the majority adhered to the wandering life. Hence the difference in the accounts of the people. While the German historians speak of the Franks, Saxons and Suevi who remained upon the soil, French writers treat of Franks, Saxons and Suevi who crossed the Rhine. AUGUSTUS THIERRY also, in narrating the events of the second part of the fifth century, relates how the Germanic League, known during two centuries by the name of Franks, or intrepid warriors, descended in several bands from the mouths of the Rhine and Meuse upon the central parts of Gaul. At the same period another tribe seized the country west of the Rhine and became known as Visigoths, while a third, the Burgundians, held the part on the east side.

There were many descendants of Roman colonists in Gaul in the fifth century, but they were unable to resist the northern invaders. The Germans, known as Burgundians, appear to have lost some of their ferocity in their contact with the colonists. But the Franks, according to THIERRY, took pleasure in ruin. They destroyed churches as well as other buildings, and spread so much havoc, there was a probability that all Gaul would submit either to the Visigoths or the Burgundians, in the hope that under either of those invaders there would be a little more chance of survival. Gaul, it should be remembered, was, prior to the invasion, probably the most civilised part of Europe. As Cardinal NEWMAN says:—"That famous country, though in a less favoured climate, was as cultivated and happy as Asia Minor after its three centuries of peace. The banks of the Rhine are said to have been lined with villas and farms; the schools of Marseilles, Autun and Bordeaux vied with those of the East and even with that of Athens; opulence had had its civilising effect upon their manners, and familiarity with the Latin classics upon their native dialect." The clergy were the only organised guardians of civilisation at the time. Many of the colonists were Aryans, and their belief was communicated to the Burgundians. Accordingly there was a large party in Gaul who would not submit to the Roman Church. The Gallo-Roman clergy in the fifth century appear, however, to have exhibited the same sort of spirit which Colonel ESMOND describes as characterising his Jesuit teacher, Father HOLT, after the failure of the scheme to restore the STUARTS. The indomitable priest turned up in America, we are told, very old and busy and hopeful, and as eager to go about in a blanket and war paint to convert the Indians as he had been to exercise diplomacy in courts and camps. When, in Gaul, "the prospect of the smoking ruins could alone distinguish the solitude of nature from the work of man,"

the clergy retained the calmness which can conquer the strongest.

Towards the close of the fifth century, when the disorganisation was at its worst, CLOVIS, or as he should be called, CHLODOWIG, was approaching Gaul. He was the idol of his tribe. His victory over SYAGRIUS in 486 was destructive of Roman dominion in Germany, and made him a hero. CLOVIS seemed, therefore, to be the coming man who was to subdue Gaul and all the German tribes within it. His march would be supposed to mean that the time was favourable for invasion, and accordingly the Alemanni, or Suabians, made a simultaneous attempt. CLOVIS was not the man to labour for the profit of others, and he resolved to test the strength of his competitors. The battle was fought at Tolbiac. In the course of it the Franks appeared to be overcome. CLOVIS was wounded, and as he felt he was helpless, he made a vow that if his enemies were defeated he would adore the god of his wife CHLOTHILDE, who although a Burgundian was a Christian. He gained his desire and respected his promise.

M. BLANC's picture expresses the incident in a marvellous way, although only a few figures could be employed in the compartment. According to some legends CLOVIS was only a youth of fifteen. MONTESQUIEU has a note on the subject, but nobody can say from it whether he credited the tradition. M. BLANC wisely avoids making the chief appear so young. He is seen supported by a couple of youths, for historians believe that what TACITUS says about the Germans of his time was no less applicable in the fifth century, viz.:—"To be surrounded by a band of young men is the source of a chief's power, in peace his highest ornament, in war his strongest bulwark." The Roman historian also explains the action of the women when he says:—"Their wives and mothers accompany them to the field of battle, and when their relatives are wounded count each honourable gash and suck the blood. They are even daring enough to mix with the combatants, taking refreshments to them and reanimating their courage. . . . They have accounts of armies put to the rout who have been brought to the charge by the women and old men preventing their flight." The excitement of men and women is contrasted with the inertness in all but one of the oxen. The angel in the sky suggests the issue of the contest. Every figure in the picture presented difficulties, and the breadth shown in modelling them is undeniable. Whether such vigorous action is the best adapted for mural painting, or how far M. BLANC's work departs from precedent, need not be considered. The French Government laid down no restrictions for the painters, and there was no more thought of making their art subservient to the architecture than when the big battle-pieces were ordered for the gallery at Versailles.

(To be continued.)

PRUDENTIAL ASSURANCE OFFICES, NOTTINGHAM.

THE numerous offices of the Prudential Assurance Association have features which recall the chief office in High Holborn, arising from the use of red brick and terra-cotta in their construction. One of the latest additions is in Nottingham, and the site offering advantages, Mr. WATERHOUSE was able to introduce a low tower, which gives emphasis to the building. The drawing from which the illustration was taken was exhibited at the last exhibition of the Royal Academy.

NO. 40 BERKELEY SQUARE.

ONE of the signs of the times is the alteration which is taking place in some of the dignified but dull streets of Mayfair and other parts of the West of London. Even Harley Street, Wigmore Street, and the neighbouring streets in a few years will present an appearance which will surprise strangers who accepted TENNYSON'S "long unlovely street" as the most characteristic description of them all. The alterations in the West End take many forms, from painting a hall door in vermilion, white, or ultra marine, and introducing a capacious parlour window, to transformation of the whole front. The improvement that is feasible by a moderate outlay will be plain to anyone who compares the house shown in the plate with those adjoining it, which are survivals of that naked and severe but grimy

simplicity which was supposed to be the most suitable characteristic for the town residence of an English gentleman.

ATHOLE HYDROPATHIC PITLOCHRY.

THE extravagant charges of Scottish hotels have had the effect of creating large buildings or hydropathic establishments which are patronised mainly by Scotsmen, who as wise folk are indifferent to the distinction which comes from paying in excess for board and lodging. The establishments have generally the advantage which picturesque and healthy situations can impart, and are besides skilfully arranged. The Pitlochry Hydropathic which we illustrate cost altogether about 80,000*l*. It is one of the best known works of the late ANDREW HEITON, of Perth, an architect who was esteemed throughout Scotland. We intend to publish views of some more of his buildings, and of various classes.

THE architect of the houses in Mount Street, published last week, is Mr. JOHN E. TROLLOPE.

ST. MARY'S, STAFFORD.

THE jubilee of the restoration of St. Mary's, Stafford, was lately celebrated. An address was delivered on the occasion by the Rev. Canon Browne, in the course of which he said:—

The beginning of the religious life of this district takes you back to very early times indeed. There are very many parts of the kingdom which cannot show so early a record as yours. The record has itself been somewhat obscured by the fact that events of later date have been interpolated in later Latin in the old record. But both from the language of the original part of the record and from the correctness of its geographical and other details, I am myself persuaded that it embodies a true tradition. The knowledge of these details had entirely died out in the later Middle Ages, when, if ever, the record was invented as a romance. We know now what they certainly did not know in those times of the connection between this country and Ireland, by way of Chester and of the roads which diverge from Chester, the one leading to London, the other to Leicester, and the details of the story fit in with what we know. The story is that a prince of the Mercian royal house, having gone to Ireland, escaped from Ireland under circumstances which I need not describe, fled to Repton, and there lived the life of a recluse. After a time he came and lived upon an island, where your river divided itself into two and flowed round some considerable piece of ground. This island was called Bethn Ey, where, the record says, is now Stafford.

Before I leave this hermit Bertelin, or more probably Bertelm, for I think that the name Bertelin is probably a mis-writing for Bertelm, and that all the names Bertelin, Bertolin, Bertelm and Bertram are one and the same, I will venture upon a suggestion as to the origin of the name of your town. I do not know what the local antiquarians have ever made to be the meaning of the Stæf in your name. That it is the Anglo-Saxon Stæf is certain from the fact which I shall mention next in order of date. And again it is certain that it was not the name of the river which was crossed here by a ford. Now we are told that when Bertelm was driven from his island he fled to the mountainous districts in the neighbourhood. This would naturally mean that he retired towards Derbyshire, and found himself in what is now the beautiful vale of Ilam, the original of Johnson's Happy Valley. There are half-way up to Ilam, at Checkley and at Ilam itself, very ancient sculptured stones, the shafts of what have been most beautiful crosses. They are quite unique, so far as I know, among the unique monumental treasures of our early past in these islands, treasures such as no other nation as far as we know possesses. At each of these places there is a very singular figure on the shafts, clearly intended to represent the same thing throughout. It is the figure of a man whose body and head are formed of interlacing bands, and who holds in each hand a long staff, reaching to the ground, passing up as high as his head. It is quite clear to anyone acquainted with these monuments that there was in the mind of the designer a definite and consistent intention in these repeated representations. I suggest that there was some event in the history of the person here represented which connected him in some special way with the use of a staff; and as I believe this to have been Bertelm, I think that the ford of the river where he lived on the island was known from this event as the ford of Stæf. This Bertelm was the patron saint of your town, and I

need not tell you under how many different forms his name appears in that connection.

We come next to the great event in your history as a town. In the year 913 Ethelfleda, the noble daughter of our noble King Alfred, the famous Lady of the Mercians, devoted herself to establishing places of strength in this district between the two great roads which I have mentioned. She founded Tamworth, and then, in the later part of the year, before Lammass, she founded the burh at Stæf-forda. That was the beginning of your existence, and those of you who live nineteen years more will have the opportunity, which I am sure Stafford will not lose, of keeping its thousandth anniversary.

It seems to me that this is the most likely time for the beginning of the body of secular canons which was established here. The Anglo-Saxons were fond of that method of carrying on the spiritual work of a considerable district, and to the end of the Anglo-Saxon period this continued to be so, as we see from the fact that Harold refounded on a scale of some magnificence the college of Waltham. At any rate, when we come to Domesday we find you set out perfectly clearly as having here thirteen prebendary canons.

In 1129 we come to a very important event. King Stephen granted to the Bishop of Chester, Lichfield and Coventry—for all these were in one pair of hands at that time—the church of Stafford. The bishop was Roger Clinton, and I wish to say a little about him, as it has occurred to me that his history may afford a solution of a problem which has long puzzled you and a great many more besides; I mean the origin of the very noble and very remarkable font in your church. Roger Clinton died at Antioch in 1148. That means that he went on that most disastrous second crusade when Louis VII. of France led a hundred thousand men to the East, most of whom never returned. In 1147 and 1148 Louis retreated to Antioch with his principal companions, after their earlier defeats by the Turks, and Louis and some of his companions made a pilgrimage thence to Jerusalem. It was in the latter year that your bishop died at Antioch. Now I would suggest that Bishop Roger, who had thought so much of your church of Stafford that he had got a grant of it from the king, had it in his mind when he was dying; and that one of his attendants came home and carried out his wishes by designing and having made this beautiful relic of antiquity, your font. It seems to me that this surmise meets all the complicated difficulties which the font presents. The Byzantine lions are thus accounted for, as well as the singularly Oriental contour of the four great lobes which form the font. The inscription at the base is strictly in keeping with this suggested connection between Stafford and the far East—"Non es discretus si non fugis, ecce leones"—"Behold, thou art not wary if thou fleest not from lions;" it takes us in thought to a country where the lion walks about seeking whom he may devour, and can actually be pointed out to unwary folk. And the very curious inscription on the upper part of the font is in keeping with the suggested connection between Stafford and Antioch and Jerusalem—"Tu de Ierusalem: Ro alem: me faciens talem: tam pulchrum tam specialem." The mention of Jerusalem is, without some explanation of this kind, a great puzzle. With this explanation it is possible that the second of the four portions of the inscription contained the name of the donor, conceivably Roger himself. In that case the font is represented as speaking its gratitude to the donor, who, "from Jerusalem," made it "such as it was, so beautiful, so rare," or possibly "so shapely," but "rare" or "unusual" would in this case be exactly in point. The usual theory is that the person baptized is speaking his gratitude to the font for making him such as he had now become—so fair, &c. The second portion, on this supposition, may have run, as has been suggested, "rorem mihi das genialem" ("givest me the genial dew"), probably in reference to "the dew of Hermon, which fell upon the hill of Zion." It is clear, however, that the font is represented as addressing the beholder in the other inscription, "Non es discretus," &c., and it appears more natural to make the font speak in this case too. On the other hand, it might be suggested that the recently-baptized person addresses the longer inscription to the font, and the font replies with the warning that baptismal grace will not of itself save him from the lions. The latter half of the longer inscription forms a hexameter verse with a double rhyme, and the earlier half forms a very clumsy beginning of a hexameter, which the words "rorem mihi das genialem" would complete. It is, however, certain that the words were not "rorem mihi das genialem," for this would mean fourteen letters and two stops in the broken part, whereas there is only room for ten or eleven letters and stops. "Roger: de: Bartalem" would exactly fit the space. I need scarcely say that if there is anything in this theory the font spent the first fifty years or so of its existence in the earlier church, which stood, as I believe, to the westward of this.

We come now to one of the most interesting coincidences which I have come across—the coincidence of two pieces of evidence which have nothing at all to do with one another. We

learn from Tanner's "Notitia" that King John founded the College of Canons here. This, of course, means that he gave it a more formal constitution, for it had existed, as we have seen, long before this, and it implies, I suppose, that he or somebody else in some way assisted its endowments at that time. And we learn from the record of these beautiful arcades, and the capitals of these noble clusters of columns, that precisely at this time this great church was as a fact begun, at a very early period of the Pointed style. All persons qualified to judge are, I suppose, agreed that the earlier part of the work was done, say, from 1180 or 1190 to 1220; and King John reigned from 1199 to 1216. The record of the stones tells us that the work went on, as indeed so great a work must have gone on in a place which cannot have been very wealthy, for a very considerable number of years. The beautiful choir was probably finished about 1270, and the whole church about 1360.

As I believe, this church of St. Mary was put on a new site, the old church of St. Bertelm being retained for use while the new church was in building, the canons, of course, using the old choir for the collegiate services, and having an altar for the service of the people at the east end of the old nave. But the old church continued to be used as a church for some time after the date which is assigned to the finishing of the present church. This is shown incidentally by an event which caused much excitement here, and led to those interpolations of later date which have cast doubt upon the earliness of the record of St. Bertelm. In 1386, one Willmot, a Stafford man—I do not know if you have Willmots among you still—who had been blind for sixteen years, was restored to sight at the offering of the Eucharist in the Mass by the priest, Joannes Crostys, in the church of St. Bertelin in Stafford.

In 1446 the church and college were granted to Humphrey, Duke of Buckingham, by Henry VI. It does not at first sight seem that a Duke of Buckingham had much to do with Stafford; but, as a matter of fact, this was one of the ancient lines of lords and earls of Stafford. There had been ten in the direct male line from father to son before him, and there were ten more before the male line ended in 1637. He got his Buckingham titles through his mother, a royal princess who transmitted to his grandson and great grandson that claim to the throne which brought them both to the block. It appears from the grant that the Duke of Buckingham had undertaken to give a hundred marks to the collegiate foundation, and I think it not improbable that advantage was taken of this to make the change from the old church to the new as a parish church. The money would amount in these days to quite a thousand pounds. If the people of the parish were to move into the nave and aisles of the new church, with the small lancet windows, which gave the only light, and the very low-walled aisles, the money would not unnaturally be spent on making the aisles loftier, inserting the larger windows in the aisle walls, raising the roof, and constructing the clerestory of the nave. The architecture agrees with this guess quite well. The old church, which adjoined the new at the west end of the south aisle, was thenceforward used as a school. Some time later than this, probably about the year 1500, the latest and poorest alterations were made. That was a time when, as we learn from wills in various parts of the country, a great deal of money was being spent upon church building and church repair. There was a sense of impending change, and the people seemed to wake up and endeavour to put things in order before the threat should come nearer.

The Reformation came. The College of Canons of Stafford was granted to Henry Lord Stafford, who had been deprived of all the titles and claims which came to him from his royal blood. He naturally would have done as other grantees in like cases did. They pulled down or appropriated to secular services the choir of the church with which the college granted to them was connected. The noble choir with its aisles, which are so beautiful a feature of this church of yours, would have shared the fate of scores and hundreds of others. You may see what has happened in the chancel of the church at Arundel, where the monuments of the Duke of Norfolk's ancestors are, or in the void place at the east of the noble Romanesque church of Blyth in Nottinghamshire. But in 1572 the church was regranted by the Crown to the burgesses of Stafford and they preserved it. We owe to the burgesses of towns two of the most striking churches we now possess. The great church of St. Albans, now a cathedral church, was to have been pulled down, but the people of the place bought it and preserved it. The same thing happened with the great Norman church of Tewkesbury, which has imbedded within it the church of earlier, probably Saxon times. Here in Stafford the choir and its aisles were used, as we know, and as some of you perhaps remember, for many purposes not ecclesiastical, and the altar was under the tower, where the people's altar had always been before the Reformation, the altar of the college being of course at the east end, or within one bay of the east end of the choir itself.

Fifty years ago the people of Stafford carried out the great restoration which brought the interior of the church to the

state in which we now find it, and it is that event which we to-day commemorate. The work of restoration has not ceased meanwhile. Much has been done to the exterior which was left undone at that time and needed doing. The noble choir in its full dimensions, broader with its aisles than the nave and its aisles, speaks to us clearly of the existence of the College of Canons here, who used it as their church. It has been enriched within the last few weeks by worthy gifts; the altar and its frontals, the beautiful candlesticks and other furniture of the altar, tell us that the succession of benefactors has not ceased. The canopies over sixteen of the twenty-four stalls are a very beautiful addition to the ornament and dignity of the choir, and they tell us of the advantages of an enclosed choir in the resonance which those who speak and sing, and those who listen, alike observe as the result of their presence.

MODERN STYLE FOUNDED ON ANCIENT GREEK ARCHITECTURE.*

THE various attempts at the revival of some ancient style of architecture being now laid up, one and all on the high and dusty shelf of failure, it may be worth while to discuss the practicability of another revival. Suppose we were to try to revive Greek architecture, how should we go to work?

The revival of a style must be of its essence and not of its mere outside forms alone. If we say that no revival of Greek architecture has been attempted we say so without ignoring the court houses and lyceums of white pine painted white, which were often faithfully studied as to diameters and entasis and the like, from Stuart and Revett, either directly or at one remove. They did not and could not constitute a revival, because they were only a simulacrum in wood of a massive stone original. So is a soap bubble of the form of an old smooth-bore cannon-ball, but yet hardly of its nature.

The Gothic revival has failed because the modern world does not construct and cannot carve stone as the Mediæval men constructed and carved.

The Romanesque revival of which we have heard would hardly have a chance of success among people who are scientific in building when they choose to be so, and who build slightly, cheaply, with thin walls, for a brief season and for profit. How should such a people take up and go on with a style created by childlike and single-minded folk; unscientific workmen building heavily because they did not know enough to do otherwise?

Roman architecture would seem to suit our occasions, for we build and decorate, as the Romans did, at two different efforts; first we build, then we decorate, and that is the Roman language of art as absolutely as Latin is the Roman language of literature. But then, Roman architecture is not a thing that ever lived with a life of its own, and so it appears that nobody has tried to revive it. It was never a subject of evolution, it was created ready made; and so our taste takes bits of it, on occasion, taking them also ready made, but without the enthusiasm of a revival.

But Greek architecture is a different thing. Simple, autochthonous, arising naturally out of the necessary processes of building, it is as human as Romanesque, as direct and logical as Gothic. Unknown to Europe until a century ago, it became the admiration of some builders and architects at a time when the long, slow process of development of style out of style, maintained since the eighth century, had come to an end amid the uproar of the great revolution. It helped a little to purify and also to formalise the work of a few architects, and it gave a fresh life and a new shape to the "colossal order," as it is called, that is, the use of columns more than one storey high in ornamentation of a many-storeyed building; also it covered the United States with pine wood and white painted ghosts of temple porticoes; but it is odd to see how little direct effect the study of Stuart and Revett and Chambers and Cockerell had upon the architectural mind of Europe. We cannot stop now to analyse that indifference; we must begin at the other end, and set up the *à priori* reasons why such indifference was natural.

What could the European architect hope to make out of a style which had no mortar or cement, and set stone upon stone with carefully fitted dry joints? of a style which admitted no arch construction of any sort and no corbels, at least in its maturity, but limited its buildings to post-and-beam construction? of a style which presented no single instance of a window, unless indeed the uncritical people of those pre-archæological days took the windows in the west wall of the Erechtheion for original specimens? of a style which offered no single instance of a chimney, and by which the great Quatremère de Quincy was encouraged to make his famous statement that chimneys were unarchitectural and must be

* A paper by Mr. Russell Sturgis, read at the Twenty-eighth Annual Convention of the American Institute of Architects.

ignored? of a style which offered no instance of the superimposition of storey upon storey, except in the two-storeyed open colonnades of Paestum and, though this they wouldn't have known, of the Attalos portico at Athens? of a style which has left us no vestige of an architectural interior, and which did not provide for interiors in the Roman sense or in our modern sense?

What could they do with such a style as that but what they did, namely, appropriate a few of its details and spoil them in using them?

But for us archæology has done its perfect work, and we know how to discover the spirit of a style of art and to weigh and measure it, imponderable as it may seem, and to inspire ourselves with it, if it should prove weighty and vast. Lord Lytton tells of a not difficult experiment in occult science, to raise from the ashes of a burnt flower a simulacrum of that flower, in form and its colours, as it lived. So, from the scattered bones of temples and boundary walls and porticoes, by dint of careful measurements, minute comparison and much hard thinking, our archæologists are showing us how to raise the perfect eidolon of a Greek structure. Perhaps the colouring of it escapes us as yet, but the form and the build of it are to be made out rather clearly, and in a general sense its sculptured decoration too. So, as we study these living shadows which we evoke, we see and feel how a Greek would have grappled with other problems than those which he had to study. It would not be so very hard to find out how a Greek of Pericles's time would have designed the Eiffel Tower.

In certain ways the architecture of the Greeks is exactly what we need. Most of all, it is tranquil and reposeful beyond other styles; and, if I know the mind of our community, tranquillity and repose in a building are the things it loves best. It is hard to believe that any fancy for picturesqueness and irregularity will ever be more than temporary. Sharp gables do not please so well as level cornices. In city architecture, at least, the level line, the horizontal line is everything except for a tower now and then; and even the tower may be horizontal in its lines, and then the tower is to go out if all our buildings are to have a tower-like altitude.

Therefore we begin with this proposition: we love Greek architecture and find it fitting for our purposes because it is tranquil and serene.

Secondly, it is what we need because it tends to use few and somewhat large parts, and rejects utterly the scale of the human body. That scale of the human body is one of the peculiarities—yes, and one of the virtues—of the Mediæval styles. Greek architecture seems to have ignored it wholly and designed its large and its small porticoes on the same principle exactly, each proportioned within itself. But this has always been the taste of our community. The best-loved buildings are those which have a few large—unreasonably and uselessly large—parts. If a house has 4-feet windows, and you should build a copy of it with 9-feet windows, you would be building a structure sure to be admired. That is absurd; it is ignorance—yes, but the more matured taste of the people and the time also is in that direction.

Thirdly, it is what we need because it does not depend for its effect upon any strongly-marked constructional peculiarities. Greek building has no strongly-marked structural peculiarities: all is post-and-beam or else mere solid piling up, and the design is so far from depending upon even that simple way of building that the Greeks took all the pains in the world to make their buildings seem to be monolithic, covering the courses and the joints alike with a sheet of stucco. Now our modern building, though it includes many processes and many methods, is on the whole devoid of any architectural character resulting from the methods of building.

This brings us to another reason why the architecture of the Greeks is exactly what we need; it is so because what peculiarities of building we have in modern times are mainly of the post-and-beam sort. The Greek could trust his hard marble for 10-feet spans, the load upon them not being great; we can trust our compound iron girders for 40-feet spans, or indefinitely more with light loads, and 18-feet or 20-feet spans with a lofty superimposition, storey above storey of piers set anywhere. The difference in scale and power is enormous; the difference in principle is not very great. Our whole steel framework system is a post-and-beam system and nothing more, and the only essential difference between this and the Greek system is that we secure our posts and beams together, and that strongly at the points of contact, which the Greeks never did or did only with slight aids to accurate adjustment and no more.

Fifthly, it is what we need because the Greeks made little use of architectural sculpture, limiting their decorative carving to slight modifications of the anthemion, of the ivy-leaf scroll, of the alternation of balls and sharp points which we call the egg-and-dart pattern, of frets and meanders. A pattern like that anthemion which we call the honeysuckle pattern once created is dwelt upon, reproduced with a thousand slight and subtle modifications, applied to painting on terra-cotta and in vivid colour on marble as well as carved in low relief; it is a

stock ornament, and a dozen such stock ornaments make up the stock of Greek architectural sculpture. The impulse to carve freely and boldly with deep incisions into stone or with broad flow of leafage in marble never seems to have come to the Greeks. And I need hardly point out how free we moderns are from any such impulse, and how readily we could follow the example of sticking to a few accepted patterns, a common stock-in-trade. We might or we might not be able to invent the few patterns in question; we could certainly adopt them though—"convey, the wise it call"—from the east and the west, and reach a common agreement as to the orthodox borders, friezes, panels and capitals.

Sixthly, it is what we need because the Greeks in their buildings used free sculpture, perfectly realised and wholly scientific, and used it largely, not as architectural sculpture, for it is not that, but as sculpture which the building was to set off. This is so obviously a way of proceeding fit for our purposes that we need only recall such a structure as the new Hôtel de Ville, of Paris, with little carved ornament but adorned by many portrait statues set against the piers of the principal storey, and by other highly finished and complete sculpture. It is to be noted, too, that the Greek sculpture is akin to our own or ours to it, in that absence of the decorative instinct, that basic study of the human form for its own sake, which distinguishes free and pure art from ornamental art. We can secure the services of admirable sculptors, and there is no reason why our buildings should not be, as the Greek buildings were, very severe and plain, very little helped by purely architectural ornament, but settings for much noble figure sculpture.

Finally, Greek architecture is what we need because the great charm of the architecture proper, that is, of the building made beautiful of the Greeks, is a refined and significant finish, a completeness and faultlessness in section of mouldings, in minute proportions, in invisible and unguessed curvature, all coming of thought and care and patient elaboration. These things are not in our way at present. The headlong race for business and for getting through business is not the way to fine designing of any sort. But again, thought and care and patience are in our way in another sense. To devote one's self, body and bones, soul and spirit, to the development of a work of art is the way a sculptor works, if he is of any use as a sculptor. It is not without absorbed attention continued through as many hours or as many mornings as may be necessary that a painting of any value is evolved from nothing. Whenever and wherever a work of architecture may be taken up as a work of art, with something like the sculptor's or the painter's purpose of succeeding and prospect of succeeding as an artist, then and there will be patient thought and a delighted lingering over every detail. The example of the Greeks will then be there to show those who will work in their way how perfection in a few simple things may be reached in a generation, and how adequate are these few and simple things made perfect to make a style great.

Still, before we sit down to the working out of a design for a twenty-storey hotel in the Greek style, it is well to consider what we are to do about the features which the Greeks, so far as we know, never used—about arches where they are needed; about chimneys where they will draw better if carried up high or serve better if put into prominent place; about windows everywhere; about superimposition of storey upon storey; about interiors and their treatment. The "scientific use of the imagination," or rather the use of the imagination informed by science, may indeed tell us all we want to know, and show the designer just how a Greek of the time of Demetrius Poliorcetes would have met these requirements. But perhaps we may as well call in the aid of our predecessors—of those who were nearer to the time of pure Greek art and ask what their methods were. Accordingly we ask the Romans of the Empire how, with a profound admiration for the Greek art but with requirements far other and far wider than the Greek requirements, they found it natural to proceed. We will not follow their example in everything; an inartistic and easily satisfied body of officials as they were with but little of a standard of perfection. But much is to be learned of them; for there was many a big building of the great imperial days which shows little of any influence but that of Greek art in its structure or design, and of those basilicas and imperial forums many instructive vestiges remain. We ask the outlying provinces in the later years of the Empire, and especially those where cut stone in abundance was to be had, rendering inexpedient the use of the familiar rubble-and-mortar and concrete construction. The Count de Vogüé's book and its valuable plates of Syrian buildings of the third, fourth and fifth centuries is our chief guide in this, not only because of the relative abundance of material therein, but because it is evident that Greek feeling prevailed in all these structures, as indeed it prevailed throughout the eastern half of the Empire in fuller strength than to the west of the Adriatic. Besides those smaller buildings of the Hauran and neighbouring districts, there are the stone-built temples of Palmyra, Gerasa and

Baalbec, the vaulted Nymphæum at Nîmes, growing up in the very Grecian atmosphere spreading around Marseilles, and other such stone-built remains in which lies plenty of evidence of the Greek spirit meeting later or Roman Empire requirements. Finally we will ask the Byzantine architects, those wonderful fellows who knew how to take the Roman official stone and mortar building, the Assyrian brick and mortar vaults, the late Italian device of setting rows of arches on rows of columns, and the pendentive vaults (wheresoever they found that), and to combine all in a wonderful style of building with lovely detail. These great men had no sense and no power of figure sculpture. Colour design, especially in mosaic, was their substitute for it, and mosaic is as much in our way as it was in theirs.

All questions may be answered, all difficulties met, all needs supplied in an enthusiastic and inventive following of the Greek style. New capitals, new Orders even, if you must have Orders, would be invented, new ornaments assuredly, and a flexible, adaptable, vigorous style of architecture might come into being, with Grecian Doric, Grecian Ionic and Græco-Roman Corinthian to start from, only of course we must stop measuring profiles and counting diameters and modules; that is not the way to design. We may, however, draw some general conclusions and lay down some general laws nearly as follow. There are reasons for each and every dictum, but they need not be given now and here.

1. The lintel to have preference always in all wall openings, except very wide ones. Arches never to be used unless really needed for constructional purposes.

2. The lintel not to be relieved by corbels but by direct vertical support, as by a column or square pier, near the jamb of the opening, or near the middle of it, as may serve best.

3. Iron and wooden beams to be used freely, for long and short spans alike, and girder construction; double-framed floors and the like to any extent. Girders and beams to be treated architecturally as lintel and as provided above.

4. Ceilings of rooms and corridors to be always flat, never vaulted and never curved or hollowed in any way, except that a camber may be given to beams or girders exactly as the upward curve was given to the stylobate and epistyle of the Parthenon, and for the same reason.

5. Roofs of halls, such as churches, where there is no storey above, to be basilica roofs—that is, of low pitch, with tie-beam construction, the whole, or nearly the whole, truss to show inside, or else a flat ceiling to be hung from the trusses.

6. Windows to be studied from the Greek doors which we possess, and also from the openings between antæ, as in the pronaos of a temple, and also from the tombs at Xanthos and Mylassa, where many short compound piers or free columns carried a very heavy superstructure. That is, windows to be of one of two sorts, either the quadrangular opening framed around with what we call an architrave, simply mitred at the top corners, or else the jambs and the dividing piers alike to be treated with capital and (generally) base, like an antæ. Where the windows are comparatively few and there is much wall surface, the square hole in the wall with bordering architrave. Where the windows are many and near together, the group or succession of openings divided by square piers.

But, as a modification where the solids between the windows may safely be very slight, free columns to be used instead of square piers, but these columns must really be free of the sash and frames. Again, as a possible modification to be worked out with care and caution, an architrave at top and sides of such a horizontal group of windows, which windows would be divided by slender columns, nearly as in some twelfth-century house fronts.

7. In the placing of storey above storey the attempt to be made, carefully and with reserve, to place openings not on a vertical axis, but the openings to be more numerous where they are smaller, and where the storey in the architectural exterior sense is lower. Generally, then, windows fewer and larger, even if subdivided below, and more numerous above. If this cannot be done there is great danger of chess-board regularity, which is good sometimes but not for a whole front.

8. No two or more superimposed windows ever to be treated as one. The horizontal band or motive formed by each storey of windows to be not merely well marked, but to be absolutely supreme.

9. Openings, door or window, to be nearly of the same size for the same building; no huge ones, no great central recessed porches with large opening. This relieves us of all probable need of arches, as in maxim one above.

10. If an arch is ever used it is to spring from a solid impost and to have plenty of solid wall on each side of it. No meeting of two archivols on the top of a column.

11. No arches except semicircular and segmental ones. No flat arches masquerading as lintels.

12. Façades to be avoided. They have come of artificial styles, and are unknown in naturally developed ones. Your design should always turn its corners. In crowded city fronts the edge of the side wall (the gable wall, party wall, or what-

ever it is) to be made the limit of the front. Temple porches, distyle in antis or tetrastyle in antis, to be studied for this.

13. The top of a building to be brought to a double-pitched roof of low pitch, wherever feasible. Such a roof, even above twenty storeys, is manageable. The gable to be cut off square at bottom by its geison invariably.

14. If a horizontal sky-line is wanted on two adjoining sides of a building the experiment to be tried cautiously, of stepping back in three or four degrees to the beginning of the actual roof. If a parapet is wanted, it is back of the geison, on top of these steps, that it should come. Overhanging and beetling effects to be studiously avoided.

15. The overhang of the cornice is, therefore, a very difficult question. On the one hand we have the Greek example of proportioning all parts of a building to each other, no matter how excessive or how limited the size; on the other, we have the impossibility of doing that in the case of high buildings, and also the Greek example of avoiding excess. Probably vertical height will replace overhang, but the design must be throughout.

16. Architectural sculpture is to be of only the simplest character, the Greek honeysuckle and trumpet-flower ornaments and ivy-leaf scroll being taken as the types. Other similar patterns may be added, but with great reserve.

17. The capitals and base of columns in like manner to be of very simple character, the first designs to be based upon the Ionic of the Erechtheion and the simplest and finest Corinthian, perhaps that of the Temple of Olympian Zeus at Athens. New capitals and new Orders based upon them will come naturally.

18. In painted ornament that which is not full descriptive or expressive art to be limited to the simplest borders and patterns, checkers and zigzags and scrolls without leafage.

19. All large expenditure for ornament to take the form of, in sculpture, perfectly realised statuary and reliefs, the best and most sculptural that we can procure; in graphic art, paintings and mosaic on flat wall surfaces, also perfectly free in design—just such as our best painters can give us.

ENGLISH ART SCHOOLS.

AT the annual meeting of the Dudley School of Art, Mr. W. Kenrick, M.P., delivered an address on the present state of the English schools of art. He said he was happy in knowing that there had been great progress made of late years in the character of the work done throughout the country, also in the public estimation in which art teaching was held. This knowledge had forced upon his mind the question, Why were the progress and public appreciation so long delayed? Schools of art had existed in England for more than forty years, but during three-fourths of that time they languished in a precarious state. Their managers had had to complain of public apathy, and the consequent inadequacy of funds for carrying them on, while, on the other hand, those who directed art industries had complained for the most part that they got no good from the schools because they did not turn out ready-made designers who were of any use to them. The origin of "Schools of Design," as they were called in this country, could be traced to the conviction of our national inferiority in artistic design compared with continental peoples, which was brought home to us by the great exhibition of 1851. It was then recognised that the too palpable inferiority of our art wares was mainly due to the absence of artistic training, which placed British designers at a great disadvantage compared with their foreign competitors; and it was believed that if the means of acquiring this training were made accessible to our designers and art workers all would go well with our industrial art products. This, however, proved to be a very partial and incomplete view of the circumstances of the case. It was not only the want of artistic knowledge and capacity in our designers and draughtsmen which needed to be supplied; there was also a want of artistic knowledge and the capacity to gauge and to value good art work on the part of the public, and this acted as an incubus and as a depressing influence, retarding all real advance towards national art. It required a generation, the teaching of Mr. John Ruskin, and the artistic collaborations of Sir E. Burne-Jones and Mr. William Morris, to arouse even a few out of the profound apathy which existed, and to point out the way of regeneration for decorative and industrial art. The revival began, naturally and rightly began, with our architects. The cabinet-maker and upholsterer followed in the wake of the architect—in fact, were often led and directed by him—and the metal-worker, potter and glass-blower brought up the rear of the new artistic army. The result had been that if individuals of even moderate means cared to make their homes pleasant and tasteful at all they could do so now in a way which would have been utterly impossible for them twenty or thirty years ago, and undoubtedly the number of those who cared so to do had greatly multiplied of late years. The

change in public taste and the increased opportunities for gratifying it were brought about outside schools of art, and he thought were little, if at all, affected by the teaching in these schools. This was due to several causes. Finally, the number of students in these schools was comparatively too insignificant to exercise any influence on the outside world; secondly, the teaching in the schools was formal, mechanical and destitute of artistic life and spirit; and thirdly—and this remained to a large extent a stumbling block and an obstacle in the way of the healthy influences which schools of art should have on decorative and industrial art—it was and is fondly believed that art could and can be combined with manufacture in a sort of joint product and glorious British compromise in which the art should not be too artistic, and the manufacture should retain its mechanical, and hence its profitable, character. This was a vain and illusory project, as little possible like the discovery of the philosopher's stone, which should have the property of converting dross into gold. The essence of art work was its expressiveness, its fancy, its variety—qualities which it only retained when the human hand traced the idea in the human brain. No machine had been, or ever could be, contrived as a substitute for the man's thought and feeling directing his cunning fingers. They could multiply a drawing by photography, print in colours from wooden blocks or from steel rollers, and they could have chromo-lithograph imitations of water-colours or oil-pictures, and stencil-painting for wall-decorations, but throughout those multiplying contrivances and processes the truth held good, that the more they were mechanical—as in casting and stamping of metals, for instance—the less they were artistic. Of the three causes to which he had ventured to attribute the failure of schools of art as they were at first established and carried on in these islands, the two former had ceased to operate or operated far less extensively and injuriously than formerly. The third still lingered among us, though he thought he saw signs that it, too, was a vanishing quantity, which ultimately would disappear where interest did not too powerfully sway conviction. Nor did he despair of seeing the day when by common consent the term of "art work" would be exclusively applied to hand-made productions, when people would insist on the real article, however little they might be able to have of it, and would not think themselves any the better off for having spurious imitations by mechanical processes, but, on the contrary, the poorer and the more unhappy. That which had had the greatest effect in popularising and in extending the influence of schools of art had, undoubtedly, in his opinion, been municipalisation. When, as in the case of the Birmingham school—which in this respect at least, as he thought he might say in other respects, led the way in a course which had been largely followed—schools were transferred to corporations and housed in buildings admirably adapted for the purpose, the care and maintenance of these schools became a municipal function, and a higher status in public estimation was obtained as well, and ample financial means were secured. This had led to an enormous increase in the number of students of every class, from the wealthy and cultivated to the poorest children in the elementary schools. It had directed public attention to the importance of the work, and for the first time induced co-operation on the part of the directors of art industries with the efforts of the committees who directed, and of the masters who taught, in art schools. The second cause of the ineffectiveness of schools of art had been removed by a complete revolution in the methods of teaching. The third cause of failure must, he was persuaded, be grappled with by the means they were employing in Birmingham in the branch school specially adapted for jewellers, and also the central school, where they had provided facilities for the designer to familiarise himself with the materials of which his design must be carried out, and by which the art worker might himself learn to design the work which he afterwards executed with his own hands. It was not too much to claim that this would bring about a revival of art work and craftsmanship. The first function of art teaching was purely educational; the second, the more technical one of training the art craftsman, the designer and the artist. Art teaching, for the purpose of drawing out and strengthening the powers of seeing accurately and observing closely in the first place, and of recording impressions in the second place, was applicable to and useful for all young persons, whether they intended to pursue art work as a calling or not. It was also most desirable that the power of judging between good and bad work, and that taste and discernment should be cultivated in all, as well as in those who had the power to produce. Without this general diffusion of artistic knowledge and sensibility we could never hope to create a truly national art. Art workers and artists who had to cater for an artistically blind and dead public would soon become blind and torpid themselves. The artist lived on sympathy and recognition; without these stimulating influences his eye became jaundiced and his hand palsied. The first object of art teaching was knowledge, the power of observing facts; the second was language, the power of expression.

Nothing was more certain than that it was impossible to observe the forms and colours of natural objects and to retain faithful impressions of them in the mind without some power of drawing and painting. To anyone who conscientiously endeavoured to represent what he saw in nature it was little short of a revelation to find how much his senses were quickened, how much his vision was enlarged, how much became apparent and precious to him in the process which had previously been hidden and neglected. After the power of vision came that of expression. The latter power would always, or nearly always, lag far behind the former, and yet the one would advance with the other, so that there would always be a more or less constant relation between them. For this reason an acquaintance with literature, especially the study of the best poets and masters of prose, was almost as important for an artist as for a writer. Refined and delicate art could only proceed from a refined and cultured mind. Such was the inevitable law of our mental and moral constitution. Hence, for the student in an ideal school of art, they must require full access to a good general and art library, a fairly complete museum of industrial art, and a picture gallery containing a few masterpieces of painting must also be provided. With regard to the method of the teaching, he was in entire agreement with what had been quite recently stated by Mr. E. R. Taylor, head master of the Birmingham School of Art, on the subject. After the constant practice of designing and as the most notable aid to art craftsmanship, he (Mr. Kenrick) should place modelling in clay. Of drawing and painting from plant and animal life, and from the draped and nude human figure, he would not speak, as the value of such studies was universally recognised in all good schools of art. Rules and systems which had become formal and stereotyped were worse than useless; they were fetters not aids. There was no finality in the art of teaching. If it was good for anything it would, as Mr. Taylor had hinted, show its vitality by growth. But there was one faculty in the teacher which he held to be essential under any system, and that was the power of sympathy which enabled him to discern latent powers of perception and expression which made up the individuality of the student, and which therefore should be directed, corrected if necessary, but never repressed. Education meant drawing out, and the successful teacher was he who could draw out what was best in each of his students. In the course of some remarks to the students of the Dudley School of Art, Mr. Kenrick said they must be assured it was only that which was stored in their minds from which they could draw when they wished to invent; out of nothing nothing could be expected, and slavish copying of other men's designs was not originality, and it was only by going to the same source of inspiration to which they went—nature—that they could hope to rival them. Constant study, constant and unremitting application—no less the demand upon them—but to such as had the gift and faculty of the artist and art craftsman, what occupation could be more delightful, and what career more satisfying and sustaining?

EXCAVATIONS IN CYPRUS.

THANKS to a generous bequest, says the *Times*, the British Museum has been enabled to start what it is hoped may prove a fruitful series of excavations in Cyprus. The first season's work began in November, 1893, and continued to May, 1894, the site chosen for this preliminary effort being Amathus, the ancient residence of Cinyras, a prince known to Homeric story for his handsome gift of a cuirass to Agamemnon when the Greek fleet was about to sail for Troy. The last appearance of Amathus in history was when King Richard I. of England, on his way to Jerusalem, destroyed it to avenge the ill-treatment which his bride Berengaria had received when some of his ships had been driven for shelter to the harbour of Amathus, then, as Limassol is now, the harbour for the south-west district of the island. The city being reduced and the whole of Cyprus, in fact, made subject to England, the nuptials of Richard and Berengaria took place, she being crowned Queen of England and of Cyprus.

The site had been partially explored by General Cesnola about twenty years ago, but, though fairly successful, he appears to have been disappointed at finding that the tombs where the most valuable objects were to be expected had already been rifled. This, together with the great expense involved in excavating tombs often at a depth of 20 feet below the surface, induced him to retire from the scene.

The Museum authorities decided to see what might remain, or, at all events, thoroughly to explore the site, so that no one need any longer speculate in vain on its possibilities. The experience of Cesnola was confirmed. It was found that the ransacking of tombs during the sixteenth century had been carried out on an extensive scale and with a singular talent for discovering the richest of them, however deep they might lie. Nevertheless, there were many that had escaped, and, though

in some cases the contents were of no great rarity, there was yet no inconsiderable number which yielded objects of first-rate importance in their kind; these have now been arranged for exhibition in the 1st Vase-room of the Museum in case B and cases 30-32.

It was expected from the traditions of Amathus that a class of antiquities might be found which would correspond to those of Mycenæ. But this was not the case. There were, indeed, obtained a certain number of scarabs bearing the cartouche of the famous Egyptian king Thothmes III. As, however, these were found in tombs which cannot by any possibility be older than the sixth century B.C., so conclusive are the other contents, we have thus fresh proof that the presence of such scarabs is of no value in determining the date of a tomb. It had been known before that a factory for the production of these and kindred scarabs existed at Naucratis, in Egypt, in the early part of the sixth century B.C., and as this is the date of the tombs in question at Amathus, we may assume that the new scarabs had been imported from that quarter along with the numerous Egyptian amulets in porcelain which have been a feature of the excavations. Objects of this kind would appeal to the strong Phœnician element in the population with its tendencies towards Egypt. The Greeks were probably not at all numerous just then. And yet it is their artistic remains that attract us most, whether imported from their kinsmen in Greek proper or executed by themselves on the spot. For instance, nothing in the way of enamelling on gold could be finer than the set of spiral ornaments such as rich ladies used in looping up their hair. The process of enamel is the same as in cloisonné, but the delicacy with which minute rosettes have their leaves inlaid in various colours and fused into a harmonious brilliancy has never been surpassed in the remains of art of this kind. Add to this the boldness of design in the gryphons' heads which terminate the spiral. Very interesting also is the small series of engraved gems dating from about the end of the sixth century B.C.—a time when minute and graceful workmanship was the ruling spirit in Greek art. Cyprus was known in antiquity for its collections of gems, and this reputation has been amply confirmed by the number of exceptionally beautiful specimens which it has yielded, first of all to General Cesnola, and since then to the casual explorations of peasants. Among the new gems may be mentioned as singularly refined in conception and execution a banded onyx, on which is engraved in very low intaglio a winged Fate, the stone itself being, as was not unusual among the Greeks, remarkably unattractive. Noticeable also are a war galley extraordinarily minute in its workmanship, a discobolus of a new type, and a cow suckling her calf against a background of papyrus plants on a pale plasma of fine colour. This last is quite excellent. There is a considerable sprinkling of gold finger-rings of various dates. But one of the strangest of the finds was a series of small ingots of gold and of silver made of a uniform shape and apparently of a uniform weight.

Cyprus has long been known for the quality and variety of its glass products, and if the present excavations have not yielded much that is absolutely new in this respect they have, at least, shown that this very beautiful ancient industry had enjoyed much favour in Amathus. Another extensive occupation was the making of statuettes and figures of every description in terra-cotta. Side by side with almost countless specimens of rude local work the usual experience has been to find only occasionally some fine example of the true Greek spirit and skill in the modelling of clay. This has again been the case. In the pottery the result is much the same—a large proportion of rude local ware by the side of a small number of vases imported directly from Greece. Unattractive as the local ware of Cyprus generally is, there are two specimens of some interest in the present series, the one for its grotesque attempt at representing a banquet, the other because, fragmentary as it is, it settles the question whether a certain type of vase with imitations of the Egyptian Hathor head was the product of an early immature art or of a period of decline. These vases are now seen to be comparatively late. Among the terra-cottas we must mention the series of models of ships, which recall the legend of a late Greek writer that Cinyras, desiring to evade his promise to send a fleet to Troy in aid of the Greeks, thought it would be sufficiently true to his word if he sent one warship with clay models of others.

An entirely new feature in Cyprus excavations has been the finding of a series of limestone stelæ or tombstones, on which is painted the figure of the person commemorated. The surface of the limestone is prepared with a white ground, on which the figure is painted in colours and in a manner which strongly recalls the frescoes of Pompeii. They are all of a comparatively late date and have suffered much from having been buried in the earth. The best of them has unfortunately been broken in two and the upper part lost. It has represented a richly-draped woman seated on a chair to the front, very boldly drawn and with a delicate sense of colour. In the course of excavations of this kind it is necessary to have some one present who knows the archaeological importance that may attach to the finding of

one class of objects with another class. During the earlier part of these excavations these duties were undertaken by Mr. Arthur Smith, an official of the British Museum. During the latter part Mr. Myres, of Christ Church, Oxford, voluntarily offered his services. In the next season, which will shortly commence, the Museum will again be represented by one of its archaeological staff, Mr. H. B. Walters.

THE LATE JAMES HAMILTON, A.R.S.A.

THE sudden death from apoplexy is announced of Mr. James Hamilton, A.R.S.A., at the early age of forty-one. The sad event, says the *Scotsman*, took place on Thursday evening, in last week, without premonitory warning, in his own house, 3 Fettes Row, Edinburgh. Born at Kilsyth in 1853, Mr. Hamilton was in his earlier years a house painter, but having artistic tastes he came to Edinburgh and studied in the Life School of the Royal Scottish Academy in 1874 and two subsequent years. He first exhibited pictures in the R.S.A. Exhibition in 1875, and from that date his name has never been absent from the catalogue. Mr. Hamilton's speciality throughout his life was the painting of scenes from Scottish history, especially of dramatic incidents associated with Highland life, and also of interiors touched with homely sentiment and Scottish character. All his sympathies were Scottish. Some years ago he paid a visit to the Continent; but on his return he emphatically declared that there was no place like home, and rarely in his works was he tempted from his allegiance to his native country. An early picture of his which attracted some notice as giving promise of greater things was called "Strolling Dancers of the Middle Ages," which was exhibited in 1881. In the following year he had also a painting of considerable merit, called "James IV. of Scotland and Princess Margaret," in which the young king was represented seated at the feet of his lady love, who played a lute. One of the most successful of his larger pictures about this time was the "Refugees of Glencoe," exhibited in 1884, in the execution of which he took infinite pains, and which was afterwards etched by his fellow Associate Mr. Aikman, and attained considerable popularity. "Leaving the Mountains to Follow Prince Charlie," exhibited in 1889, was also a large picture pervaded with something of the old Jacobite spirit; and he had frequently smaller studies of Highlanders with such titles as "On the Alert" or "A Highland Outpost," invariably conceived in a dramatic vein. In 1893 he exhibited at the Mound a large picture, with subject taken from an incident in the "Legend of Montrose," in which Sir Duncan Campbell, Annet Lyle, and Allan M'Aulay figured. In respect of composition, colour, and character, this was, perhaps, the best of his semi-historical works. Last year he had in the Academy a very happy and characteristic piece of domestic genre, "When the Bairnies are Asleep," the truthfulness of the sentiment of which awoke a responsive feeling in the hearts of the spectators. Mr. Hamilton likewise painted landscape with an appreciative brush. In that, as in his figure subjects, he was sometimes unequal; but one can recall especially a number of Ayrshire coast and land scenes which were of a very pleasing character. He also essayed portraiture, and in this connection his picture of the Rev. Dr. Matheson, of St. Bernard's Church, which was exhibited in 1892, may be particularly mentioned. For some time past Mr. Hamilton was working for a special sale which he was to have had at Dowell's next month. Mr. Hamilton, who was twice married, is survived by a widow and one child. In private life he was, though quiet and unobtrusive in manner, of a social disposition, and had many good qualities, not the least of which were an ardent love of his art and that perseverance which enabled him to surmount many difficulties in the attainment of the position he occupied in his profession.

SIR C. L. EASTLAKE ON THE DECORATION OF HOUSES.

THE painter and scholar who was President of the Royal Academy, Director of the National Gallery, Secretary to the Royal Commission on Fine Art and holder of various other offices, exercised much influence in England. His great abilities were mainly employed to enable his countrymen to appreciate Italian art, and especially the examples of the great masters of the Renaissance. The Blue Books on the decoration of the Houses of Parliament are full of evidence of his knowledge of all the processes of fresco and other varieties of wall-painting when applied to public buildings. The following letter by Sir Charles Eastlake reveals him in a new light, for in it he endeavours to show how far English mansions can be made to correspond with Italian villas of an earlier date, and accordingly it contains suggestions which can never become obsolete:—

The word "decoration," however appropriate to fantastic ornaments, and in some degree to figures, has, as you know,

been considered vilifying when applied to works that are addressed to the mind. But, as we have no other term, we must consent to use it in both meanings. It is, indeed, important to remember that no works of art, however elevated, can dispense with the appeal, the impressive or winning appeal, to the eye. Thus much for our definition of terms.

As a general principle in decoration, I would recommend that the eye should be solely or chiefly addressed where a passing glance only can be given to the work, and that the attention should be more taxed where leisure and surrounding circumstances permit or invite contemplation. The reverse of this would be manifestly wrong; but the recommendation itself is not to be understood too literally. Every display has its legitimate exuberance; the "over and above" in decoration can only be that of quality, for mere taste is supposed to define all that relates to quantity. As common poetic description sometimes exalts its subject less by accumulation than by substituting costly or choice materials for ordinary ones, so in art the augmenting excellence ascends from sense to thought. If, therefore, the intention to afford mental pleasure is very apparent even in situations where this may appear superfluous and in a manner thrown away, the impression must of itself be elevating. But the indispensable condition is that a gradation should still be maintained; that higher excellence should still be in reserve. What must be the character of works of art to which Raphael's corridor in the Vatican forms the mere approach? The answer is given by the perfection of the works in the Stanze. All that is to be insisted on, therefore, is a due gradation in conformity with the principle first proposed. In the remarks that follow, I cannot strictly adhere to the plan of the house, but must often generalise; the observations submitted, if tenable at all, will, however, be easily applicable to your purpose.

The Hall.

The pavement of the halls might be enriched, but I can hardly approve the occasional practice of the ancients in placing "histories" under their feet.* The forms and hues employed should be merely calculated to gratify the sight. Among other preliminary considerations, I would also include the nature of the mere surface as well as the distinction of every apartment. A pavement, for instance, however decorated, should still express the character of firmness and solidity. For this reason I would banish even the lowest kind (that of plants) and every approach to perspective. Geometrical forms would thus be alone admissible; the variety is infinite, but even here I would again exclude abrupt and irregular contrasts of colour, which have sometimes the effect of making the evenness of the surface doubtful; the last consideration is, indeed, applicable to carpets. With respect to the classic fashion of inscriptions on the threshold, I merely remark that letters are only ornamental in architecture when disposed symmetrically within the space which constitutes their framework.

In approving the common practice of placing statues and bas-reliefs in the principal hall, I do not depart from the spirit of our first principles. A statue has generally the advantage of being seen in various points of view, and thus commands attention in situations where paintings could not. Associations of classic taste are naturally connected with the classic materials of marble or bronze; and architecture, when displayed as such, seems to acquire additional solidity by the presence of sculpture. But works of sculpture of the first excellence should be admitted to the library or drawing-room, and even fragments of rare beauty should be enshrined with like distinction. For the present, however, we are in the hall. I do not recommend mixing mural painting and sculpture: no painted devices should compete injudiciously with the bas-reliefs. But let us suppose that your bas-reliefs are in the outer hall, and that you have only some sculptured vases on detached pedestals in the inner hall or corridor, then by all means decorate the walls of the latter with arabesques: to these we shall return.

The Staircase.

In the staircase, also, it will be necessary to make your election between the two arts. I will assume that you decide for painting. Few people linger in a staircase; still fewer break their necks to look at a painted ceiling. If the scene affect the eye and the imagination agreeably, this may be considered sufficient. When we see the whole Pantheon on the ceiling and walls of great staircases, this undoubtedly might be defended on the ground that a mere passing impression of magnificence is intended; but the exuberance of quantity rather than of quality is here obvious. In whatever mode the walls of the staircase are adorned, the decoration should be entirely subservient to the architectural effect. This involves a more radical objection to the mythologic crowds before alluded to, because they have frequently the effect (and intentionally so) of destroy-

ing all idea of the angles of the building. I am of opinion, on the contrary, that the decorator should dispose his paintings in shapes which shall appear to grow out of and complete the architecture. The inclination of the panelling of the wall to agree with the line of the stairs may be considered incompatible with paintings; a horizontal termination, perhaps level with the chief landing-place, is essential, and the triangular spaces or sections of such spaces, between this and the stairs, had better be left nearly plain, and not very light in colour. Of all modes of destroying legitimate illusion, that of introducing painted figures, sometimes the size of life, where living figures must often come in contact with them, is the most effectual.

The compartment or compartments above that horizontal line might be painted in fresco, certainly not in oil on the wall, nor in the newly-revived encaustic, at least not till it has been further tried. The figures should not extend to the angles of the walls where the staircase turns; the pseudo or real compartments which form the frames might finish at a little distance from the angle; the real wall is, in short, never to be lost sight of; and if ocular illusion is attempted at all, it should be rather with a view to complete and enrich the architectural forms than to destroy them. Where the light is unfavourable for painting, the flattest style of bas-relief is still admissible. But as you are especially desirous of having your staircase coloured, I really can propose nothing fitter to gratify the eye and imagination merely, than the more refined but at the same time familiar subjects of the Greek mythology, such as the personifications of poetry, the progress of the hours and of light, the seasons and so forth. Such subjects afford the best materials for mere beauty of line and drapery, for composition generally, and, if not too statue-like, for colour; and even when they suggest no profounder range of thought (not that their import is necessarily thus superficial), they leave an elegant impression on the mind. The objection is that they are old; but there would be some novelty in treating them as detached compositions, instead of beclouding and peopling the whole space in the style of the seventeenth century. It is to be remarked that Raphael and Michel Angelo bounded their compositions of this kind by definite forms, especially on ceilings. Pietro da Cortona and the machinists generally were as intent on destroying the connection between painting and architecture as the great masters were to preserve it.

But this separation of the compositions into compartments supposes at once a great latitude in the choice of subjects. Milton's smaller poems, and many other English sources, might be preferred to classic inventions; only it should be remembered that fresco, from the nature of its means, is privileged to aim at the ideal rather than the actual world, and that the character of the decorations required for the place must necessarily influence the selection and treatment of the subjects. Dark effects are equally unfit for the situation and for the powers of fresco. In the ornamented divisions of the compartments, perhaps partial gilding might be employed with better effect than colours; on the ceiling both might be introduced (in merely decorative forms) unless your staircase ends in light, in which case your glass must of course be ornamented, even if colourless.

The Dining-room.

Dining-rooms, strictly so called and employed, are generally unadorned with pictures, this hardly seems necessary. In theory we may admit that subjects requiring some contemplation would be out of place in a room exclusively devoted to "the table;" but portraits of celebrated individuals and landscapes, although they cannot be duly examined in such moments, may convey associations to which the spectator, even if not particularly conversant in pictures, is supposed to be alive at all times. Portraits of the class alluded to as historic texts are connected with time; as landscape, especially if founded on actual scenes, may suggest the memory of place. A room used for the purpose in question and for nothing else is, however, not the place where fine works of art should be bestowed; and I incline to think that this is the fittest field for small frescoes and arabesques. This, in short, is one of the occasions to please the eye and the imagination merely. Accordingly, in the mode proposed, no definite idea is presented to the mind, but an air of elegant and festive splendour surrounds the guests. There should, however, be endless variety; scarcely a form should be repeated in the details, although an architectural symmetry is, as usual, to be preserved in the masses.

The Morning-room.

A dining-room *per se* is not uncommon, but a professed and exclusive breakfast-room supposes a degree of order in the family migrations, to which the muses could hardly be expected to accommodate themselves. Nevertheless, to complete my catalogue, I will suppose one, or rather I will suppose that one of your drawing-rooms is used chiefly as a morning-room. Indeed, without condemning a family to betake themselves to particular rooms at stated hours, it may be allowable

* The passion for this kind of decoration was carried so far that the ornamented floor of the dining-room sometimes represented the scattered fragments of a repast. Plin. l. xxxvi. c. 25.

to decorate and furnish apartments on such a supposition, by way of insuring a marked and agreeable variety of character. Lucullus had even a series of dining-rooms from the "Apollo" downwards; and we learn from Vitruvius* that the opulent Romans changed the scene of their banquets according to the season of the year. The morning has its own feelings even for those whom affluence frees from any kind of labour. The purposes of the day are unfinished—everything is contingent. Under such circumstances the character or subject of pictures is to be adapted to the mind—not the mind to the subject. The open face of nature by sea and land may here enliven the walls, and agree with the excursive feelings of the hour. The chase and its incidents may here triumph. The English pastoral is here strictly in its place. Solemn themes, solemn effects, should not be admitted, while all that responds to buoyancy of spirit would, on the contrary, be appropriate. It need not be gravely objected that accidental or even average states of feeling may be little in unison with the impressions which the arts profess to give, for the same objection is frequently applicable to all the accompaniments of civilised life, nay, to the beauties of nature, which so often appeal even to cultivated human sympathies in vain. The occasional contradiction is unavoidable, where, of two conditions, one is permanent, the other mutable.

Corridors and Pavilions.

Corridors on the ground-floor, or even upstairs in houses where pictures do not abound, may be fitly decorated with arabesques. The same kind of ornament might be applied to garden pavilions, and, in the present instance, even to your portico next the lake if no statues are there, but not to conservatories, where the conventional forms and tints of art would contend injudiciously with nature. In these decorations it is absolutely necessary to set out with an architectural scheme, and subdivide the spaces with some attention to congruity and subordination. In the details, pleasing masses and forms are essential, because here nothing can be concealed; there is, strictly speaking, no chiaroscuro, no perspective; form and colour are the chief means. The possibility of approaching and even coming in contact with the painted wall, suggests the necessity of a small scale in the objects, and of precision and delicacy of outline; yet, from the circumstance of the forms and hues being relieved on a light ground, they are at the same time effective at a considerable distance.† Stucco ornaments in very low relief, mixed with the painting, are admissible (as they can hardly be said to come under the head of sculpture) but they require a strong light to display them.

I cannot recommend frescoes for the sitting-rooms of dwelling-houses. The sum of enjoyment to be derived from one or two large paintings is not to be compared to that which the contributions of various schools can afford, even assuming the highest merit. Some frescoes of the Villa Madama near Rome, from the school of Raphael, show that such works may be beautifully executed in a small size, but they still seem fitter for open galleries than for rooms. I have only ventured to except the dining-room. The impossibility of change in the apartments we live in is an unpleasant feeling; in a public building, on the contrary, it is satisfactory, and a staircase or a professed dining-room approaches this character.

Family Portraits.

I may here observe that a staircase covered with ancient family portraits is seldom agreeable to the eye; indeed if it were a desirable kind of decoration, centuries must often elapse before the materials would be ready. The first impression on seeing a quantity of portraits in a staircase is that it is an accidental if not a troublesome accumulation, and that there is no room for the pictures in better situations. Far be it from me to speak with any disrespect of the taste for family portraits, so peculiar to the English and so calculated, as Johnson said, to foster their "domestic charities;" but I hold it not always necessary to place the portraits of the household in prominent situations. The interest such works inspire is, in most cases, strictly domestic and private. The portrait has, in short, no pretension to be conspicuous to all eyes till the individual is celebrated or till the work of art is canonised. These conditions, I admit, may often exist from the first moment; but then, *à fortiori*, a staircase is not the place for such a production. The ostentatious Romans appropriated one of the most public rooms of the house (the tablinum) to genealogies, records and inscriptions relating to the family history, and covered the remaining space—often the atrium as well—with the portraits

and busts of their ancestors.* This does not appear to have been the custom with the Athenians.

The Library.

We have decided against frescoes in what are called sitting-rooms; your oil-pictures are, however, to be selected. I shall consider the library as distinct from the drawing-rooms; but it is quite possible to blend their character. The library in the Ducal Palace at Urbino had a room or study adjoining it, decorated with portraits (in this case, by the way, they appear to have been frescoes) of learned men of all ages. In a library, literally to be used as such, pictures of extensive interest seem to be inappropriate. They may be said to divert the attention from the business or amusement of the place. But the portrait of the poet or of the sage is a source of pleasing and elevating associations, and may sometimes command a deep interest. The library may contain the cabinets of gems and medals, the collections of engravings, the terra-cottas, &c.; or if the drawing-room is ample enough, all these treasures of virtu may be deposited there. I prefer a library without coloured decorations; the woodwork may be carved in flat relief, even to the panels of the walls; a mode of decoration now beautifully supplied by embossed leather, which need not be dark in colour. Whatever colour appears, except in the portraits, miniatures or illuminations hung around, should be in the books; these should strike the eye, and be so to speak in the foreground of the picture. Vases or busts may surmount the cases. The ancients preferred the latter; and many, like Asinius Pollio, collected in their libraries the authentic and even imaginary portraits of great men. Among the latter was the bust of Homer.† But the light is generally so unfavourable in the upper part of modern rooms that busts, when placed so high, are reduced to mere ornaments and require the addition of names. This, indeed, is not objectionable in any case, for the interest of a portrait commonly depends on historical associations. I see no objection even to inscribing both the subject and the name of the master under works of art generally: a volume bears its title and author's name, and pictures to many are as sealed books till inquiry is stimulated or interest quickened by similar means. When the description is too long to admit of this, the words "See Catalogue, No. —" might be added.

If colour be admitted anywhere in the library, it might be in subjects on the ceiling, allowable here, if at all, in the region of easy chairs and occasional meditation; perhaps, too, to a certain extent in the windows. The introduction of subjects on ceilings has not been recommended generally, but in the system of arabesque painting the universal decoration of the walls requires to be carried into the ceiling. Sculpture, from the reasons already given, or rather in accordance with the same taste, is quite admissible in the library. Cicero frequently writes to his friend at Athens to send him any good works in sculpture, fit to adorn the library and residence of a man of letters.‡

(To be concluded.)

TESSERÆ.

Cairene Houses.

THE first and all-important object of the Mohammedan architect was to screen the women of the house from the view of strangers. Caïrene building rests on the principle that the inmates of the house must neither be seen of passers by nor see too much themselves of the outside world. Hence the prime condition of Domestic architecture was to build the rooms round an interior court, into which the chief windows looked, and to make as few windows as possible, and those few closely latticed. As a result, those streets of Cairo which are lined with private houses exhibit a somewhat monotonous aspect. The houses are generally two or three storeys high—in the old Mamluk days they were of five storeys—and are built of stone on the ground-floor (coloured in alternate red and white courses with red ochre and limewash), and of brick tied with wood and coated with white plaster on the upper storeys. The doors are often very tastefully ornamented, but there the external decoration generally ends, for the windows on the ground-floor are generally but small rectangular apertures closed with lattice-work, and set high above the reach of curious eyes, and even those on the upper storeys are commonly small and plain, and

* Juv. Sat. 8; Plin. l. xxxv. c. 2.

† Plin. l. xxxv. c. 2.

‡ *Epist. ad Attic.* l. i. c. 3, 8, 9, 10, &c. It is remarkable that a bas-relief, in the finest Greek style, representing a philosopher reading, was found in the ruins of Cicero's Tusculan villa. Some English sculptors and myself during an excursion from Rome, I may almost say, discovered this marble, walled into the staircase of the Episcopal Palace at Grotta Ferrata. A mould was afterwards taken from it, through the exertions of Mr. Gibson, and the cast is now common in Rome. The marble was, I think, afterwards removed to the Vatican.

* *De Architect.* l. vi. c. 7.

† The best examples of decorations of this kind are now accessible to all, in a recent work by Thürmer and Gutensohn, containing the arabesques of the Vatican, the Farnesina, the Villa Lanti, and the Villa Madama, edited by Mr. Ludwig Gruner, and published by Mr. Murray. With this work may be classed the publications of Zahn, on the ornamental inventions of Giulio Romano at Mantua, and on the decorations of Pompeii.

arranged with no regard to symmetry, though there are still some examples of streets where the higher floors of the houses are furnished with richly ornamented lattice-windows. These lattice-windows are called *meshrebriyas*, "drinking-places," from the semicircular or semi-octagonal bow which commonly juts out from their centre, in which the porous water-bottles of the house are placed to cool by evaporation in the air. Unlike the mosques, there are no friezes of ornament or inscriptions on the outer walls of houses. The door generally opens flat against the side wall of the passage inside, turning upon a pivot in the lintel and threshold, and is confronted by the *mastaba* or stone seat (sometimes replaced by a *dikka* or chair of lattice-work) on which the doorkeeper (*bawwab*) sits. Thence a passage, which makes one or two sharp bends, with the intention of foiling any attempt of inquisitive eyes to see into the interior through the door when it happens to be open, leads into a square court, unpaved and open to the sky, in which is a tree shading the well supplied by infiltration from the Nile with somewhat brackish water. No eye should see into the court from any other house, and still less from any street.

The Escorial and Versailles.

Spanish writers have termed the Escorial the eighth wonder of the world. It was erected by Philip II. in the performance of a vow, and was meant to serve the threefold purpose of a palace, a monastery and a mausoleum or tomb. It was dedicated to St. Lawrence and built in the form of the gridiron on which the saint was broiled. According to the computation of Los Santos, accepted as an authority by Prescott, it would take four days to go through all the rooms, the distance to be covered being 120 miles. He states that there are no less than 12,000 doors and windows in the building, that the weight of the keys amounted to 1,250 lbs., and that there were sixty-eight fountains in the halls or courts. The cost was six millions of ducats. The founder of the Escorial was influenced by a religious motive, if a bigoted one. The founder of Versailles thought of nothing but his own personal gratification. He would not hear of completing the Louvre, which Colbert pressed upon him. He wanted something that should date from him and be exclusively associated with his name—something that should stand out in solitary grandeur apart from the capital, which did not afford breathing room for the monarch whose emblem was the sun and his device "L'état: c'est moi." The site was the worst he could have chosen, and its disadvantages, from the nature of the soil and want of water, could only be overcome by enormous sacrifices of men and money. Hundreds of workmen, poisoned by the exhalations, were carried away and replaced at night. Of the 20,000 soldiers and 6,000 cavalry or artillery horses employed very few were found fit for service when they were required for the war. A river, the Eure, was turned to supply the fountains and cascades. Voltaire computes the cost at 500 millions of livres, Mirabeau at 1,200 millions, J. B. Say at 900 millions; M. Henri Martin, making allowance for the altered value of money, sets down the cost of Versailles with its dependencies at 400 millions of francs, or 16 millions sterling. Both M. Baudrillard and M. Henri Martin seem to think that the nation has got value for its money, that Versailles is a monument of which they have reason to feel proud. "History lives in this palace in these gardens; it gives life even to this mythology as a perpetual symbol. After all, is it not France which here shows herself to us brilliant, honoured, powerful?" Considering the year the huge pile was completed, just after the revocation of the Edict of Nantes, we should say that it is rather overtaxed, persecuted, impoverished, depopulated France that is recalled and represented by Versailles.

Picturesque Planning.

In its first analysis architecture is the expression of plan and construction in a building. To speak broadly, there are two faculties displayed in the art—invention and imagination. Invention has to do with the plan and scheme of a building and the relation of its parts; and the artist calls this faculty into play in much the same way as the dramatist creates his characters, disposes of their destinies, thinks out the course of events in his story, and sets the scenes. But in the best work invention goes no further, imagination must do the rest. The eye of the body can go so far, and the rest must be left to the eye of the mind. Having made the plan and settled the scheme of the structure, its height and size, invention retires and imagination takes up the tale. Out of the picturesque plan grows picturesque construction, and if it be a great building like the Parthenon, or Beauvais, or St. Paul's, or York, there is a delicate skeleton of admirably articulated parts underlying and sustaining everything. This skeleton of related parts not only fulfils its primary office of keeping the building from sinking on itself a shapeless heap, but the various constructive features themselves are made beautiful, while they conduce to the general beauty of the whole. It has been wrongly supposed that it is in Gothic art alone that picturesque planning is used as a source of expression. The art of all ages proves to the contrary. To take a typical Classical

example, the architect of the Erechtheum, as Mr. Fergusson has pointed out, took the greatest possible pains to produce variety and contrast in the grouping of the three temples of which the Erechtheum consisted, and no Gothic architect in his wildest moments could have conceived anything more picturesquely irregular than the whole becomes. Indeed, there can be no greater mistake than to suppose that Greek architecture was fettered by any fixed laws of symmetry. Wren's noble series of City churches afford us quite an intellectual treat in this respect, and in order to properly gauge the dexterity of the man, we must bear in mind that the old walls of the churches that had been burnt down were in many cases left standing, to be used as the substructure of his new building. St. Stephen's, Walbrook, is an example in point, where, within the limits of the four plain walls which mark the boundary of the old church, the architect has reared a nave, choir and transept, with a dome over the intersection, and has produced pleasant effects by means of numerous columns, and the domical ceiling which they carry.

The Acropolis of Athens.

The Acropolis in its humiliation must carry our thoughts to the Acropolis in the days of its glory. The mind must strive to realise, however faintly, the splendours of that gorgeous assemblage of structures—to restore in idea, however feebly, these most beautiful creations of human genius. We cannot but form some picture of those superb portals, and that majestic flight of steps by which the Panathenaic pomp ascended to the shrine of the virgin goddess; of the glorious sculptures which almost lived and breathed on pediment and frieze and metope; of the long lines of sculptured forms which graced every avenue, while far above all the brazen statue of Athena kept watch over her beloved city. Something also we must realise of the accessories of this marvellous scene—the brilliancy of sky and sun, the lustrous purity of the marble, the tints of gold and crimson and azure which imparted depth of light and shade to the mouldings and sculptures of its magnificent temples. And with the pictures of these exquisite structures must be associated the men who planned and reared them; and an array of questions comes crowding upon us, some of which we may perhaps seek in vain to answer. What is it which invests the works of these men with their mysterious and touching beauty? Whence came the grace and loveliness which they imparted to all on which they laid their hands? Were the forms and the spirit of their art their own, or had both come to them from some other land? What were the laws which influenced their works even to their pettiest details, and infused boundless vigour and freedom into the arts, the literature and the social life of Greece? These are questions which no superficial or hasty thought can ever solve; they are the promptings of no artificial curiosity, no mere antiquarian or archaeological problems. The answer to them will not merely lay open a most important phase in the history of the human mind, but involves results directly practical. The city which Pericles proclaimed as the school of Greece has become also the school of the world, and its influence is still seen in every form of our art and architecture. To trace this influence and assign its cause, to analyse the principles of that art which attained to a degree of beauty never perhaps equalled, certainly never surpassed, are questions of no slight moment and difficulty, and the more so because indubitably the aim of that art was pre-eminently simple and definite. Emotions of grandeur and sublimity, still more of solemnity and awe, may be awakened in a higher degree by the works of other times and countries. The Athenian cared not to oppress the spectator with the cumbrous grandeur of Thebes or Babylon; he sought not to delight and awe him with the soaring height and intricate magnificence of the Gothic minster, or impress him with the sense of indomitable strength and power manifest in the genuine works of ancient Rome; and yet, with a scale just sufficing to save it from meanness, Attic art revealed to the world an exquisite grace and dignified beauty as little marred by defect or blemish as can be any works of merely human hands. Unrivalled in elegance and purity of form it disdained no aids of metals or of colours, which some might look upon as adventitious and unworthy. It raised its statues in stone or marble, in gold and ivory, or in bronze. It decked its superb pediments and architraves in sombre or in brilliant hues; and the colours which modern use would reserve for internal decoration gleamed on the eye of the spectator beneath the lustrous atmosphere of Attica.

Armorial Bearings.

There is no doubt that emblems somewhat similar to armorial bearings have been immemorially used both in war and peace. The shields of ancient warriors, and devices upon coins or seals bear no distant resemblance to modern blazonry. But the general introduction of such bearings, as hereditary distinctions, has been sometimes attributed to tournaments, wherein the champions were distinguished by fanciful devices; sometimes to the crusades, where a multitude of all nations and

languages stood in need of some visible token to denote the banners of their respective chiefs. In fact, the peculiar symbols of heraldry point to both these sources, and have been borrowed in part from each. Hereditary arms were perhaps scarcely used by private families before the beginning of the thirteenth century. We have not any decisive evidence that hereditary arms were borne in the twelfth century, except by a very few royal or almost royal families. Those of Geoffrey the Fair, Count of Anjou, who died in 1150, are extant on his shield: azure, four lions rampant or. If arms had been considered as hereditary at that time, this should be the bearing of England, which, as we all know, differs considerably. Louis VII. sprinkled his seal and coin with fleurs-de-lys, a very ancient device, or rather ornament, and the same as what are sometimes called bees. The golden ornaments found in the tomb of Childeric I. at Tournai, which may be seen in the library of Paris, may pass either as fleurs-de-lys or bees. Charles V. reduced the number to three, and thus fixed the arms of France. The Counts of Toulouse used their cross in the twelfth age; but no other arms, Vaissette tells us, can be traced in Languedoc so far back. Armorial bearings were in use among the Saracens during the later crusades, as appears by a passage in Joinville, and Du Cange's note upon it. Perhaps, however, they may have been adopted in imitation of the Franks, like the ceremonies of knighthood. Villaret ingeniously conjectures that the separation of different branches of the same family by their settlements in Palestine led to the use of hereditary arms, in order to preserve the connection. M. Sismondi seemed to entertain no doubt that the noble families of Pisa had their armorial distinctions in the beginning of the twelfth century. It is at least probable that heraldic devices were as ancient in Italy as in any part of Europe. And the authors of "*Nouveau Traité de Diplomatie*" incline to refer hereditary arms even in France to the beginning of the twelfth century, though without producing any evidence for this. From the thirteenth century, however, they became very general, and have contributed to elucidate that branch of history, whatever value we may assign to it, which regards the descent of illustrious families.

Beauty in Architecture.

Can it be supposed by any who have thought on the subject that beauty of form or gracefulness of proportion, even in mouldings, depends upon chance? Some law, known or unknown, rules each. But is there anything more difficult to define than beauty? We know that there is a beauty in form, in colour, in expression; still, who shall lay down a law of beauty which shall embrace under one head the most exquisite productions of the Classic and Eastern and Western art, and those of the Mediæval periods? Who can reconcile under one common canon the massive column of the Doric and the slender shafts of the Gothic periods? Each has its beauty, and that not a beauty of caprice or fashion. No doubt, then, that there are different qualities of beauty, but still there must be some leading principle, of which these are but various developments. What is the value of M. Fezuz's axiom that "beauty in the arts is but a national or educational prejudice and inconsistent, since it depends only upon the fashion of the time?" Even Sir J. Reynolds contended that beauty was conventional. "One man," says he, "prefers a swan, another a dove." True, but who prefers a goose to a swan?

Pershore and Salisbury.

In 1288 a great fire occurred, which destroyed the tower and nearly the whole church of Pershore. It is probable that the new choir escaped with little injury, as no discolouration by fire is here visible, as is the case elsewhere, though it is possible that the ruined state of the bases of the columns may in some degree have arisen from it. Elsewhere, however, the traces of fire are everywhere to be seen. There is no clue to the date of the work consequent upon the disaster; but its style indicates an interval of about half a century, and Mr. Wickenden tells us that at forty years after the fire the tower and nave are still spoken of as ruinous. This carries us on to nearly 1330. Soon after this the work of reconstruction must have commenced. It would have been most interesting to have ascertained the actual date and circumstances of this work, not only as being a remarkably noble specimen of the architecture of the fourteenth century, but on account of its containing the most remarkable internal evidence of a connection of some kind with the greatest parallel work of the age—the central tower of the cathedral of Salisbury. It may seem strange at first sight to claim so close a parallelism between so gorgeous a work as that last-named and one comparatively so simple as that of Pershore, yet the more carefully they are compared the more convincing is the evidence that they were either designed by the same hand, or that one was directly imitated from the other. The late Sir Gilbert Scott believed that the former was the case, and that the tower of Pershore was a slightly later work of the Salisbury architect. At Salisbury the cathedral had in the main been completed by

about the middle of the thirteenth century, or a little later. The central tower, however, had only been carried a little above the ridges of the four abutting roofs, and the storey against which these roofs impinged was a lantern storey, the walls of which were rendered hollow by a passage through their thickness, fronted towards the interior with elegant pillars and forming window-like screen work. The angles expanded into projecting turrets of a peculiar form, neither square nor octagonal, but a union of the two. These were perforated by staircases. Thus far at Salisbury the work belonged to the thirteenth century; and on this, as a sub-structure, the architect of the fourteenth century created with singular temerity but with great artistic skill the present stupendous tower and spire. Now if we credit the Pershore tower to the same architect, what do we find was the course he followed? Having no lantern storey provided for him as at Salisbury, he commenced by translating that which he had found ready to his hand into the style of his own period. Having erected his lantern storey he proceeded to cap it externally with a battlemented cornice, which is simply a reproduction with trifling alterations of that with which he had crowned the older lantern at Salisbury. Upon this he erected a bell-storey, which is nothing more or less than the first stage of his Salisbury tower, studiously divested of its richer detail. Every feature is alike, though simplified, and the lower stage is merely a plainer version of the corresponding stage at Salisbury, the great distinction being that it is but one, whereas there are two in the prototype, and a spire in addition. The details bear considerable resemblance—the distribution of windows, blanks and piers is absolutely identical, and so is even the peculiar plan of the stair turrets, as also are the very remarkable bands of quatre-foils, &c. which divide the stages of the buttresses. While speaking, however, of the details as being simplified from those at Salisbury, we must except the internal features of the lantern. These of course differ in style as they do in date from the original, but they are far richer and more beautiful; indeed it would be difficult to find a lantern storey so beautiful as that at Pershore, and it stands quite alone in its design. The analogy between Pershore and Salisbury, however, extends beyond the tower. The vaulting of the choir was at the same time completed and the flying buttresses with the pinnacles consequently carried out, and these latter closely resemble those executed simultaneously with the tower at Salisbury; even the little frill of leaves round the bases of the pinnacles are identical, as are also the very peculiar horizontal cuts in the copings of the flying buttresses. Such a multitude of coincidences could not possibly be accidental, nor could they be the result of mere imitation; they seem to be only capable of being accounted for by the two structures having been designed by the same hand, and unhappily they agree in another particular—the utter absence of information as to their date and erection.

Planes in Moresque Stucco.

A favourite habit of the Moors of Granada and Seville in the technical working of their stucco, by the use of which they give an appearance of extraordinary elaboration to their decorations, consists in working different patterns on different planes of the same piece of stucco work. At a distance the dominant lines of the pattern only are apparent; on a nearer approach the pattern comes into sight, which fills up the bold openings left between the dominant lines of the top pattern; and on a still closer inspection, a third series of forms running counter to the main lines on the pattern on the second plane and filling up the interstices of it, may be traced. From their peculiar sharpness it is probable that few or none of the repeats of these patterns were done from moulds by the operation of casting, but that wire or cut-metal stencils were used as guides for the pointed tools and knives, by which superfluous plaster was removed whilst the whole was yet in a plastic state. This method of shaping semi-plastic stucco with sharp tools is likely to have been derived by the Moors from Roman traditions, as many examples of a similar mode of working are to be seen at Rome, Pompeii, Naples, and elsewhere in Italy.

Magnitude in Architecture.

The works of the architect are usually on a far larger scale than those of the painter and sculptor, and therefore subordinate parts may not unfrequently derive even undue importance from their size and unavoidable conspicuousness. In architecture the quality of grandeur is more dependent on actual magnitude than is the case in the sister arts. The architect may even be able to win applause by the forcible effect obtained from the mere bulk and extent. Yet still architecture has this in common with the sister arts, that whatever praise a building may obtain by reason of its meritorious proportions, or of the grandeur of its general effect, those merits are so greatly increased, and the pleasure derived by the critical eye is so materially enhanced by the discovery of those smaller beauties of design that are revealed only by a

close and critical examination of the subordinate parts, that we can never venture to be indifferent to the value of such details. Such has been the opinion of most men of great artistic genius at all periods.

Contingencies in Building.

There is a vast distance between the theorist and the man of experience. The one proceeds on the assumption that all the facts are of a definite class, and limited by certain circumstances; that the materials at hand are homogeneous throughout, and of the best quality; that the workmanship is of the most perfect description; that the season of performing the work is the most favourable; and that no contingency arises which may not be anticipated. But too frequently the most irksome incidents may baffle the practical man at every step. The ignorance or inattention or absence of the assistant or superintendent may afford opportunity for the introduction of bad materials. The inefficiency, neglect, or dishonesty of the artisan may render the work unsound, an unskilful foreman may render it insecure. The dishonesty of the quarryman may introduce a bad material, which the mason may not care to observe. A quantity of dead lime or cement may deprive the mortar of its cementitious quality. A shower of rain, a storm, or a frost, unforeseen, ill provided against, may produce serious evils. A sudden spring, an unknown cavity in the foundations, may cause a settlement. Such are some of the adverse incidents that may arise, and demand all the science, experience, the patient endurance and energy of the well-grounded architect to triumph over them all.

Early Greek Sculpture.

The Temple of Athena, though the most important of the shrines of the Acropolis in the sixth century, certainly did not stand alone. For we have recovered the whole or part of five or six other pediments of small size, and executed in rough local stone. These compositions now form one of the most conspicuous features of the Acropolis Museum and arouse the wonder, far more than the admiration, of visitors. To those who are accustomed to consider Greek art as a thing dropped from the skies, calm, colourless and faultless, they must come with a shock, for both in form and in colour these interesting memorials of the early art of Greece are bold, awkward and wanting in all refinement. Perhaps the most curious of them is the pediment put together by the skill of Dr. Brückner, in which Zeus and Heracles in the midst are fighting back to back against two monsters advancing against them from the corners, on one side the giant snake Echidna, on the other Typhon, a winged figure with three human bodies and interwoven snakes for feet, a monster coloured throughout with brightest red and blue and green, which might seem better suited for the adornment of a Mexican than of a Greek temple to those who have not realised that Greek art, like every other art, was of gradual growth and started from barbarous beginnings. Interesting as these pediments are historically, one cannot wonder that the contemporaries of Themistocles were very ready to thrust them out of sight. But these sculptures are of older date than those of Pisistratus.

GENERAL.

Mr. G. H. Godsall, of Hereford, has obtained first place in the competition for the St. James's School.

The Architectural Subject assigned to the competitors for the prize which is a memorial of Achille Leclère, is a pavilion for the display of Sèvres pottery at the International Exhibition of 1900.

An Anonymous Donor, a lady, has given a sum of 1,500*l.* towards the erection of new Sunday schools at Basingstoke.

The Great Bentley School Board have appointed Mr. J. W. Start, F.S.I., of Colchester and Harwich, as their architect for the new schools to accommodate 250 children, with the necessary offices, playgrounds, &c., about to be erected near the railway station.

The Society of Architects is proceeding with its arrangements for the examination of candidates for membership. The following gentlemen have been appointed members of the examination committee:—Mr. E. J. Hamilton (president), Mr. Ernest Day, F.R.I.B.A., and Mr. George Highton, F.R.I.B.A. (vice-presidents), *ex-officio* members; and Messrs. Edgar Farman, Henry Lovegrove, A.R.I.B.A., Major F. S. Leslie, R.E., Ellis Marsland, G. A. T. Middleton, A.R.I.B.A., and H. G. Quartermain. It is hoped that the committee will be able to recommend several courses of instruction, which have final examinations now held at various educational centres, as

suitable alternatives to one or more branches of the Society's examination.

The Archbishop of Canterbury has accepted an invitation from the Dean of Bristol (Dr. Pigou) to preach the sermon at a special service at the cathedral on May 6 next, in connection with the Cathedral Completion Movement, the work of restoration having now reached an advanced stage.

Earl Cowper, chairman of the Herts County Council, has offered to provide a farm of nearly 300 acres, with a residence and buildings, rent free, for affording practical instruction in agriculture, conditionally on the County Council stocking the farm and working it. He has also offered to erect a laboratory and dormitories.

The Annual Meeting of the subscribers to the Aberdeen Art Gallery has just been held, Lord Provost Stewart presiding. The report showed that the balance against the account was 8*l.* 10*s.* worse than at the same period last year, standing at 108*l.* 5*s.* 8*d.* The Lord Provost said the present exhibition had been the most successful in the history of the institution. The number of visitors was 29,764.

Paisley Art Institute Exhibition has been opened. The Provost mentioned that within the next few days a new Board would be created in Paisley, which could not fail to give a considerable impetus to art education in regard of the management of the proposed new Technical College.

The Manchester Board of Guardians have passed a resolution expressive of their sympathy with the family of the late Mr. James Murgatroyd, who during more than forty years directed the building operations of the Board, including the erection of the workhouse and infirmary at Crumpsall.

The War Office will, it is understood, apply to Parliament for a vote of three millions for the erection of barracks, as the sum of five millions lately granted is insufficient.

Mr. C. B. Fowler, having ceased to work conjointly with Mr. F. R. Kempson, will carry on the business of an architect and surveyor at Old Bank Chambers, Cardiff.

The Bishop of Liverpool on Tuesday, in the course of a sermon, explained why there was no cathedral in Liverpool. He said the cost would be half a million, besides 100,000*l.* for endowment. There was no doubt plenty of money in Liverpool, but he despaired of raising half a million for a cathedral, as it must be remembered that all the people of Liverpool were not members of the Church of England.

The Parish Church, Perth, which forms the central portion of the old historic edifice, St. John's Cathedral, was injured by a fire on Monday that arose from the overheating of a stove. The pews and other woodwork on the ground floor and the west wing were destroyed, the damage being estimated at over 1,000*l.*

The Institution of Civil Engineers has attained its seventy-seventh anniversary. It now numbers 1,846 members, 3,647 associate members, 359 associates, 17 honorary members and 791 students, making a total of 6,660 of all classes.

The New Sun Insurance Office in Glasgow, designed by Mr. W. Leiper, A.R.S.A., is completed. The style is Renaissance.

Mr. Edward de Martino has been appointed Marine Painter-in-Ordinary to the Queen, in succession to the late Sir O. W. Brierly.

The late Sir C. T. Newton has bequeathed his archaeological drawings, diagrams and photographs to the University of Oxford for the use of the Professor of Classical Archaeology.

A Volume entitled "Les Architectes élèves de l'Ecole Nationale des Beaux-Arts" has been compiled by MM. Penanrun, Roux and Delaire, which is a record of the architects taught in the school and their works. The preface is by M. Charles Garnier.

The Memorial-stone has been laid of a new church for Everton, which is to be built from the designs of Mr. George Bradbury by Messrs. J. & G. Chappell, builders, of Walton.

The Church of the parish of Inch, near Stranraer, has been destroyed by fire. The building, which was erected some thirty-three years back, was only partially insured.

An Industrial Exhibition has been opened at Cambuslang under the auspices of the directors of the public institute.

The Umpire, Mr. Christopher Oakley, appointed by the Board of Trade in the arbitration proceedings between Lord Lonsdale and the Manchester Corporation, in regard to the claim by his lordship for 8,500*l.* in respect to wayleave and the value of minerals taken by the Corporation in the construction of the Thirlmere aqueduct, has given his award, allowing 1,664*l.* for wayleave and 327*l.* for minerals taken and used, making a total of 1,991*l.*, 9*s.* less than was offered on behalf of the Corporation with a view to an amicable settlement being arrived at. It will be remembered that the Corporation settled the claims of the other proprietors, and in addition to offering Lord Lonsdale 2,000*l.* they offered to pay all the claimant's expenses.

THE WEEK.

THE most interesting part of the Winter Exhibition at the Royal Academy for many visitors will be the Water-Colour Room, which is occupied with "a collection illustrating the sculptor-goldsmith's art, chiefly of the fifteenth and sixteenth centuries." The room also contains seventeen copies of RAPHAEL'S great paintings in the Vatican, which, although on a much smaller scale than the originals, suggest their grace and nobility. The designs for goldsmith's work range from the early part of the sixteenth century to the close of the eighteenth, and they are attributed to such artists as CELLINI, DÜRER, MICHEL ANGELO, GIULIO ROMANO, STOTHARD and FLAXMAN. They may be said to have a common character, as the majority are deftly drawn with a pen in bistre or sepia, with slight washes of colour. It is evident that a slavish reproduction was not expected; the craftsman was allowed much liberty. There is also a design by GRINLING GIBBONS for the Holder Monument in St. Paul's, as well as the contract deed for the work, the price being 20*l*. Sir J. C. ROBINSON is the fortunate owner of a large number of the objects in the cases. The most interesting are the antique gems, which have the delicacy that is expected in such work. There is, however, hardly one example in gold, silver, bronze, ivory or enamel, in wood or stone, which is not delightful. Many of them exhibit far more of the artistic spirit than is found in paintings, and they will serve, we hope, as a corrective of the modern notion which identifies painting with art, a fallacy that has wrought much evil in this country.

It is, we suppose, only natural that in cases of compulsory purchase of property for public works owners should endeavour to obtain exorbitant prices. The usual rule of trade is reversed, for the buyer and not the vendor is the master of the situation. There is, therefore, probably some excuse for the majority of the six hundred people who have endeavoured to make the Manchester Corporation pay liberally for the ground that was needed in connection with the new waterworks. To claim 100,000*l*. for a property that brings in 500*l*. a year, or two hundred years purchase, does however appear unbusinesslike, although we may allow the standard of value is marvellously elastic. Lord LONSDALE claimed about 12,000*l*., and the umpire in the recent arbitration awarded 1,991*l*., or about a sixth. Proprietors cannot be expected to be impartial, for their self-esteem enhances all things belonging to them. But it is different with experts. The valuers on Lord LONSDALE'S side considered that the property was worth from 12,304*l*. to 12,894*l*. None of the valuers for the Manchester Corporation would go beyond 1,300*l*. Whether his lordship received the larger or the smaller sum is of no consequence to the public. But valuing is a profession and is supposed to be guided by some sort of precision. What can the public believe when they find that one valuer swears that property is worth ten times the sum which a brother valuer fixes for it, or the reverse? They would be amazed if warehouse porters differed to a similar extent in measuring cotton goods, and they must be sceptical about the value of a process which cannot result in a closer approximation than one is to ten.

THE Emperor of GERMANY recently founded a prize of 1,000 marks, which is to be distributed annually. It is offered in the hope that it will promote the study of the examples of Classic sculpture which are found in the Berlin Museum. The subject selected for last year has some novelty. One of the examples is the head of a young woman which was found at Pergamos. The face has the opulent character of the *Venus of Melos*, but unfortunately it is imperfect. The hair was twisted into a knot, but a part has vanished. Still more to be deplored is the absence of the nose. In March it was proposed to offer the prize to the young artist who would produce the best restoration of the head. As a classic nose is straight, it is supposed to be easier to draw or model than an English one that is "top-tilted like a flower." No less than one hundred and

fifty artists believed they were competent to make the required reparations. But when the models were sent in a week ago, it was found that after some months of trial no more than thirty attempts had been followed out to the end. It has to be decided whether any of the models deserves a reward of 50*l*., but the competition will have its use if all who took part in it will henceforth realise the inimitableness of Greek sculpture, and if they will be lenient in criticising the efforts of the Renaissance artists who added legs and arms to old figures.

THE highest honours do not always bring commissions to French artists. When M. TURCAN, the sculptor, obtained the médaille d'honneur of the Salon in 1888 for his group, *The Blind and the Paralytic*, which is now in the Luxembourg, he was justified in believing that his fortune was secure. But since then he has lived in extreme poverty. He bore his misery with stoicism. A few weeks ago he was attacked with ataxy, and his condition could not be concealed. With their usual generosity the artists of Paris promptly got up a lottery for M. TURCAN'S benefit, and several important works were contributed. A sum of about 1,000*l*. was raised. The unfortunate sculptor was not able to make much use of the relief which came to him, for he died on Thursday in last week. M. TURCAN was in his forty-eighth year.

THE rules of a trade society may be binding on members, but outsiders cannot take advantage of them. A decision to that effect has been given in Dublin. Two plasterers in the employment of Messrs. PEMBERTON, builders, were sent to work in Carlow, where they remained a fortnight. It takes only a few hours to reach that town from Dublin, but the men were paid their wages for the day, tram fare and car hire. Their work was completed, and they left Carlow at 10 o'clock on a Saturday. The men received travelling expenses, but Messrs. PEMBERTON considered that by the rules of the society they were not bound to pay for the time spent in travelling back to Dublin. They admitted at the hearing they were willing to abide by the magistrates' decision. Evidence was produced about the interpretation usually given to the rules by the workmen, and after a long investigation it was decided that the men should be paid for the time they were travelling, and they were allowed costs.

USERS of traction engines are likely to find scant mercy from the new parish councils. A more microscopic examination of the condition of roads will follow, and for every rut which exceeds the average depth somebody will be mulcted if possible. The traction engine is considered an arch offender, and a farmer or a contractor who uses one of them must expect to pay more than the sum charged for hiring. It happens also that a great many lawyers have accepted seats on the councils, and they are not likely to allow local interests to suffer if the law affords any remedy. We find, for example, Sir WALTER PHILLIMORE, who is chairman of the Shiplake Council, forsaking black-letter statutes in order to survey the roads in his district, and to explain to his neighbours how the damage arising from extraordinary traffic could be summarily recovered. The law is to be put in force immediately against owners and users of traction engines in Shiplake, as an experiment. It would be wiser to inquire how much it would cost to maintain roads in a condition to sustain such traffic. Engines are a necessity, and every obstacle to their use is a danger to agriculture and trade. If they injure roads it is generally owing to the defective condition of the surface.

WE learn that the Theatre Royal, Cambridge, which has been so ably conducted by Mr. W. B. REDFERN, J.P., D.L. Cambridge, for the last thirteen years, is about to be pulled down shortly to make way for an entirely new theatre, the designing of which has been entrusted to Mr. ERNEST RÜNTZ, architect, who so recently has reconstructed the new Pavilion Theatre, Mile End. The property will be taken over by a limited company, and a large amount of the capital is already arranged for.

OLD LONDON BRIDGE.*

THE construction of a bridge of an unusual character like the Tower Bridge or the Forth Bridge excites in our time little interest except among experts. People have become so familiar with engineering marvels, they accept an addition to the number without surprise. It is therefore possible that the "other Bridges over the Thames built by the Corporation of London," which are described in Mr. WELCH'S volume, may be looked upon superciliously, as if they were insignificant affairs which any student in a technical school could easily surpass. The progress of bridge construction is unquestionable, but it is well to remember how much has depended on improvements in the manufacture of iron. The difference between Old London Bridge and modern bridges of masonry is not so remarkable as to justify the people of the nineteenth century in their assumption of superiority.

Take the latest example of the class across the Thames, the Putney Bridge, as a proof. The roadway is wider than in the ancient bridge, but we must take into account the difference of traffic in Mediæval and in modern days. The waterways were undoubtedly narrower in Old London Bridge. That was partly owing to the system of hydraulics which was accepted, but mainly to the omnipotence of the Pointed arch. If plate beams were still held to be the only safe form of employing wrought-iron (as was the case fifty years ago), the Forth Bridge would not exist. The Mediæval builders were as confident about the virtues of the Pointed arch as STEPHENSON and his followers were about plate beams, and the use of a semicircular form was moreover prohibited, for it would be accounted a sort of heresy. As the gradients of Old London Bridge were an obstacle to high arches, the builders were limited in their spans. We must remember also that the builders of the bridge were compelled to use stones which were comparatively small. In those days there were no enormous blocks of granite available for the masons. It was therefore considered necessary to oppose a large solid mass to the currents, and the durability of the bridge proved that the builders' conclusions were correct. Conservation has altered the character of the Thames. As late as the middle of the seventeenth century the roar of the waters at London Bridge was startling. DRYDEN, in the beginning of his noble essay on "Dramatic Poesy" (a conversation worthy of PLATO), relates how he and some grantees resolved to pass down the river, in order to ascertain the result of the great naval battle which was to decide whether England or Holland was to have "the command of the greater part of the globe, the commerce of nations and the riches of the universe." When they approached London Bridge the sound of the cannon was rendered inaudible, and therefore the companions "made haste to shoot the bridge and left behind them that great fall of waters which hindered them from hearing what they desired." There is other evidence to the same effect, and although some of the noise probably arose from the rushing of water through hydraulic machinery on the Middlesex side, there is no doubt the irregularity of the bed of the river was also a factor. When these circumstances are considered, Old London Bridge may sustain a comparison with any of the masonry bridges of the present century.

When was the first effort made to span the Thames? To that question there can be no definite answer. ROACH SMITH, who was active in exploring during the excavations for the existing bridge, maintained that a bridge existed for use of the Roman settlement. London was not much valued by the Romans, for its military importance was of little account, otherwise we might conclude that from the mere interest of the constructive problem they would have built a bridge across the Thames as well as across the Rhine. Apparently there was no urgent need for a bridge,

and it is now assumed by many archæologists one did not exist in Londinum. There is no record about a bridge earlier than an Icelandic saga of the thirteenth century, which refers to a structure wide enough to allow two carriages to pass. It was, however, easily overthrown, for as we related recently, OLAF the Viking and his men tore down the props sustaining it in the time of King ÆTHELRED. The king must have erected another bridge or restored the old one, for he enacted that "whoever shall come to the bridge in a boat in which there are fish, he himself being a dealer, shall pay one halfpenny for toll, and if it be a larger vessel one penny." If we can accept the tradition preserved by the clergy of St. Mary Overy Church, and which JOHN STROW records, the first bridge in its origin resembled many others in Christendom:—

A ferry being kept in place where now the bridge is built, at length the ferryman and his wife deceasing left the same ferry to their only daughter, a maiden named Mary, which with the goods left by her parents, and also with the profits arising of the said ferry, built a house of Sisters, in place where now standeth the east part of St. Mary Overies Church, above the choir, where she was buried, unto which house she gave the oversight and profits of the ferry; but afterwards the said house of Sisters being converted into a college of priests, the priests built the bridge of timber, as all the other of the great bridges of this land were, and from time to time kept the same in good reparation, till at length, considering the great charges of repairing the same, there was by aid of the citizens of London, and others, a bridge built with arches of stone.

The stone bridge was commenced about 1176 by PETER, a priest who was attached to the church of St. Mary Colechurch, off the Poultry, and in which THOMAS A BECKET was baptized. There was then, as now, a Bridge House Trust, forming part of the Corporation, that possessed property. But the construction of a stone bridge across the Thames was in the twelfth century as costly an undertaking as the erection of a Tower Bridge with mechanical contrivances is in our day. The Corporation funds were inadequate. Contributions were sought, and among the donors were Archbishop RICHARD, who succeeded BECKET, and Cardinal DI PETRALONE, the Papal legate. PETER, the architect, gave his services gratuitously, and in addition erected, at his own expense, the chapel which was dedicated to the Canterbury martyr. HENRY II. imposed a tax on wool in order to raise funds. The new bridge appeared to be almost under royal control. King JOHN wished to have Father PETER superseded by ISAMBERT of Xaintes. The king also ordered that the profits of the houses should be assigned to the maintenance of the bridge. In 1212 they were destroyed by fire, and the Trust was crippled by the loss. HENRY III. seized the revenues, and after his death Queen ELEANOR insisted on her right to possess them. Towards the close of the century the bridge had fallen through neglect into a state of ruin, and its downfall was anticipated. EDWARD I. was prudent, and besides allowing the Corporation to have charge of the bridge and its revenues, approved of appeals towards its support.

The information relating to the early days of the bridge is not always vouched by documents, and if Mr. WELCH'S volume repeated only what is related in other books, it would not possess the peculiar interest it now has for antiquarians. From the end of the fourteenth century the history of London Bridge assumes a new aspect. Instead of mythic personages who appear to have cropped up at dates far apart, we have genuine citizens who exercised authority, and found it brought them trouble. The bridge was placed under wardens who were annually elected, and their accounts and other records, with some omissions, date from 1381. The facsimiles given by Mr. WELCH suggest that clerks were more artistic in the old days than at present. Some of the documents are works of art. It is a pity the griffin which was designed by JOHN NORMANVILLE, clerk of works in 1490, which appears on one of them, was not utilised by the Corporation when they resolved to erect the memorial at Temple Bar. It has the true heraldic character. The initial letters have the advantage of suggesting that they are distinctly penwork. The seals attached are often of historic importance.

What appears most interesting to us is the information about works and workmen which Mr. WELCH furnishes. In the account for 1494-95 we learn that 6s. 8d. was awarded to JOHN ISAAC, who had become blind and impotent, in consideration of his good and true service. Two surgeons

* *History of the Tower Bridge and of Other Bridges Over the Thames Built by the Corporation of London*, including an Account of the Bridge House Trust from the Twelfth Century, based on the Records of the Bridge House Estates Committee, by Charles Welch, F.S.A., Librarian to the Corporation of London, with a Description of the Tower Bridge by J. Wolfe Barry, C.B., M.Inst.C.E., Engineer to the Bridge, and an Introduction by the Rev. Canon Benham, B.D., F.S.A. Prepared under the direction of the Bridge House Estates Committee (Sir Albert J. Altman, chairman). Smith, Elder & Co.

are paid 58s. 4d. "for healing of a great wound in the head of JOHN ALERTON, carpenter, hurt at the bridge by default of the old gin." JOHN PATTESLEE breaks his finger, and 20d. is paid for curing it. Shoes, we find, were provided for carpenters working in the water, and gloves for masons and carpenters. At one time the masons employed at the windows are so busy they cannot go out for dinner; they are compensated by a payment of 6½d. We discover also that some workmen received commons, and that a steward and purveyor were employed to look after the comfort of the men. The relative value of labour in 1381-82 may be inferred from an account. The clerk received 20d. a week, six carpenters 22s., four masons 14s. 3d., two sawyers 7s., a mariner 2s. 6d., the cook and keeper of the dogs 22d., a carter 22d., a boy 2s., a paviour 3s. 4d., a plasterer and servant 4s. 6d.

The number of men belonging to the staff would suggest without further evidence that the bridge was hardly equal to sustain the wear and tear of traffic. As Mr. WELCH says, "The history of the bridge is almost a narrative of repairs." The roadway was so defective in 1425 it was necessary to prohibit carts shod with iron from passing under a penalty of 6s. 8d. The arches and piers were also liable to fall out of repair through the negligent guidance of hoys, barges and boats. There was a drawbridge between the sixth and seventh piers on the Surrey side, which was a continual source of expense, although it was of no more advantage than some of the opening bridges which the Board of Trade demand on lines of railway crossing shallow creeks.

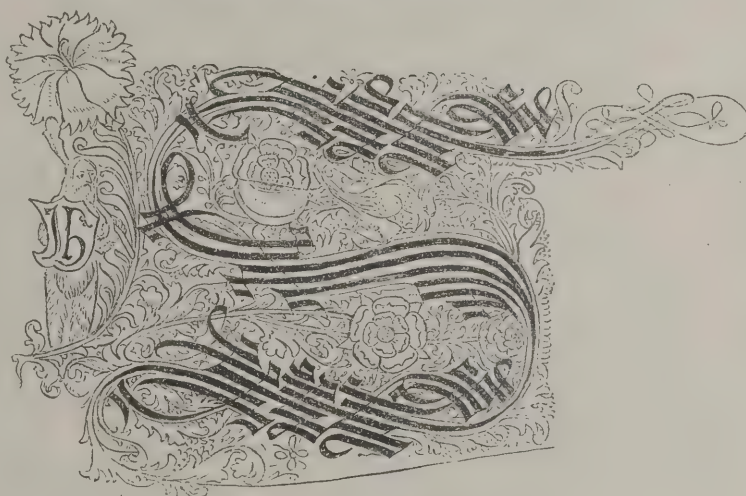
The most efficient of all the causes which operated against the bridge was probably the rows of houses. Judging from the old prints of the bridge, they were higher than the majority of buildings in the City. The effect of wind acting upon so large a surface was transferred to the bridge and must have shaken the masonry. The shops and houses were a favourite resort, and as the Corporation was always tenderly disposed towards tenants, it was never decided to remove structures that were injuring the bridge. The difficulty of navigation is suggested by the fines which were imposed on sailors for injuries to the houses. In

1460 it appears there were 129 tenements on the bridge. A lease of 1613 describes a house in the middle west part as consisting of a hanging cellar, shop and counting-house attached, hall and chamber over the shop, a little dark chamber, kitchen, a little void room, a chamber behind, three little rooms over the kitchen and three other chambers. That occasionally the structures were of a gorgeous appearance is suggested by the description of one of the sixteenth-century buildings known as "Nonesuch House."

The chapel, which stood over the middle pier, was like some of those attached to palaces, and consisted of an upper and lower part. It was dedicated to ST. THOMAS A BECKET, on whose festival, as on Christmas Day, the chapel was attended by as many worshippers as could be packed within 60 feet by 20 feet. From what has been said on the subject it might be supposed the chapel was only an oratory, but Mr. WELCH has been able to prove by unquestionable evidence that in St. Thomas's Chapel services were held as in ordinary churches. It was occasionally employed for special services for foreigners. Mr. WELCH's description of the chapel is like one of the old illuminations, in which what is most essential in ecclesiology appears to have been introduced. The account of the latter days of the building will suggest the skill with which he has used the materials supplied by the records:—

In 1539-40 we hear the first knell of the chapel's approaching doom in the change of its dedication, 2s. being paid "to a paynter dwellinge in Southwarke for delasyng and mendyng of dyvers pictures of Thomas Beckett in Our Lady Chapell upon the Bridge." The clerical staff had become reduced to one priest and one clerk in 1541-42. In 1543 "a brotherer" (broderer) received 13s. 4d. for the "altering of the marterdom of Thomas Beckett into the image of Our

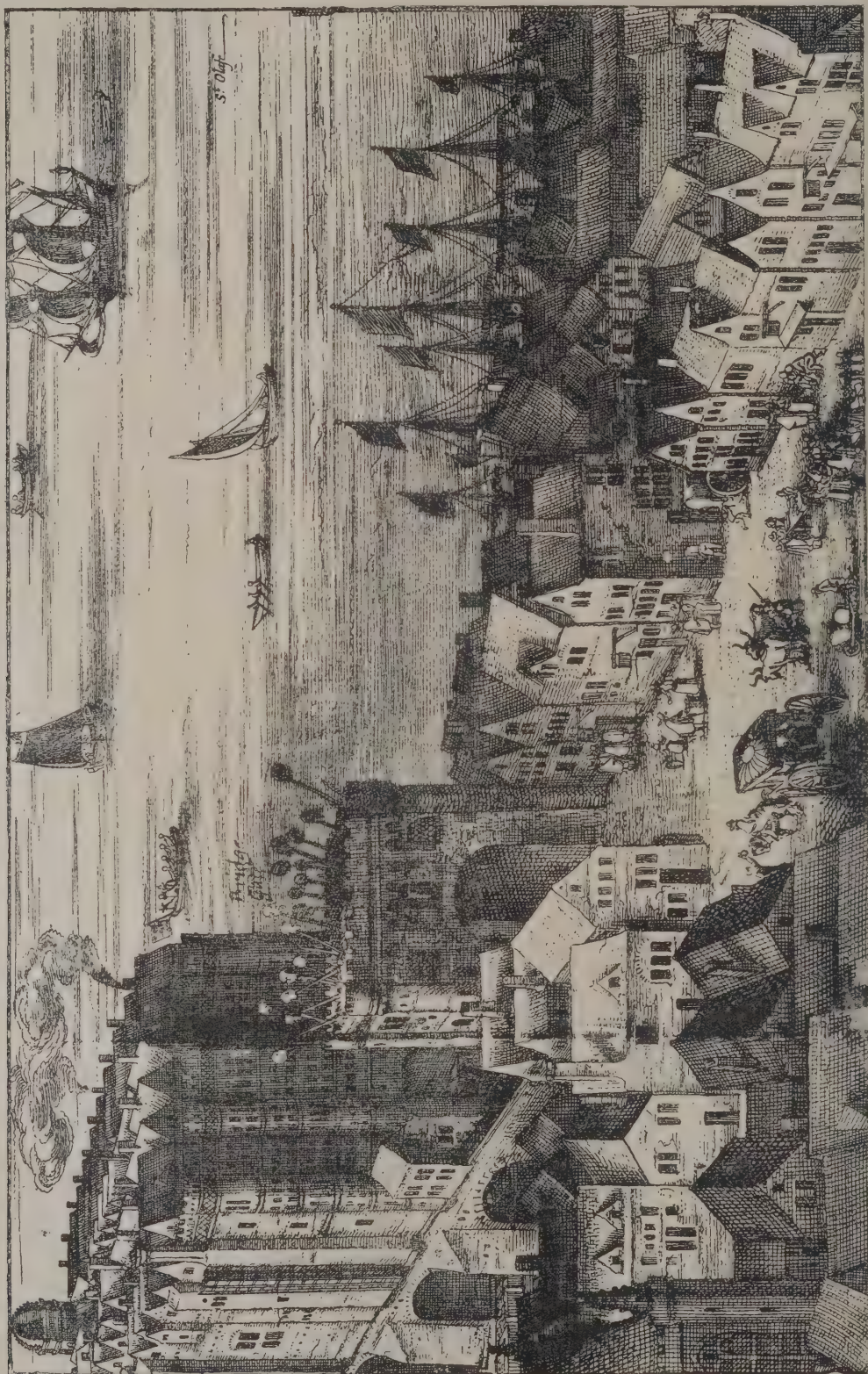
Lady." A law suit sounded a mournful anticipation of the end, and a committee of Common Council met to debate "concerning the staying of Ashley's suit touching the chapel on the bridge." The final sentence came in 1549. "It is agreid," runs a City minute of January 22, 1548-49, "that Mr. Wyllford and Mr. Judde, surveyours of the workes of the brydge, shall to-morrowe begyn to cause the chapell upon the same brydge to be defaced, and to be translated into a dwelling-house, with as moche spede as they convenientlye maye." For a year or two, nevertheless, the wretched remnant of the once beautiful edifice lingered on, being in charge of a watchman, Hew B'swell, who kept guard over the condemned walls at 2s. a week. In 1553 the



INITIAL LETTERS FROM THE REGISTER OF DEEDS RELATING TO LONDON BRIDGE.

agents of destruction appeared on the scene. Masons and carpenters take stone from stone and beam from beam. Labouers carry chalk and rubbish and boards, and make the place "clean"—a cleanness that might have drawn tears from the shade of honest Peter of Colechurch. The history winds up with this prosaic record. "1566-67. Received the 25th January, of Drewe Momperson, in part payment of 40 marks for a license to set over the lease of his house, the late chapel upon the bridge, for the term of years to come that was granted to William Bridger, grocer, his predecessor, deceased, 6*l.* 13*s.* 4*d.*

a boat on the water. The arch, it will be observed, is not Pointed. On the reverse is the martyrdom at Canterbury. "The Archbishop," says Mr. WELCH, "is kneeling before the altar, which is indicated by a lofty candlestick. His arms are raised and his hands joined in a posture of resignation. Immediately facing him on the left are two knights armed *cap-à-pie* in chain armour, each of whom is pro-



THE BRIDGE GATE IN 1616. (From Visscher's View of London)

There were probably many citizens who in secret were as grieved as the shade of PETER the architect. The memory of THOMAS À BECKET as a citizen and the son of a citizen was dear to the inhabitants. His image appeared on the various City seals, and, strange to say, it still survives (with St. PAUL) on the mayoralty seal. The ancient seal of the Bridge House, as will be seen from the annexed copy of an imperfect impression which is still preserved as one of the Corporation treasures, represented on the obverse the Saint enthroned above an arch of London Bridge, with

ected by a long pointed shield. The foremost knight is smiting the Archbishop on the head with a sword, the other is striking with a sword his companion GRIM, who is holding the cross. Above the knights is a star of five points."

From the importance of the bridge it is no wonder it was from an early period protected by gates and defences at the ends and near the drawbridge. The Southwark entrance was the more important point, and consequently, after the fall of the tower which stood there in 1436, we read how "divers charitable citizens gave large sums of

money" to erect another building, the charity being only another name for a desire to be secure. The new gate was destroyed in 1471 by FALCONBRIDGE. Its successor was more fortunate and endured till 1766. The appearance of the gate in 1616, with its ghastly crown of traitors' heads, may be judged from VISSCHER'S drawing.

It is not difficult to imagine the condition of the roadway of Old London Bridge. In 1669 COSMO DE MEDICI found it was almost impossible to cross owing to the number of vehicles, and the complaints about congested traffic were as general in the sixteenth and seventeenth centuries as they were in the nineteenth. Unlike the present bridge, there were attractions to tempt people to loiter in front of the painted and gilded booths, just as they still do in Cheap-side. In spite of its narrowness the bridgeway was constantly utilised for public receptions, and that may have been one of the reasons which made such lofty buildings desirable. Mr. WELCH supplies descriptions of many of those scenes, from which we extract the following:—

A novel spectacle attracted crowds to the bridge on April 15, 1413, the coronation day of Henry V., as will be gathered from the subjoined entry in the accounts:—"Divers expenses, steyning, painting, linen, cloth, and plates and other things for the giant, together with other workmen and chanters, with their apparel, on the coming of the king at his coronation to London Bridge, 9*l*. 13*s*. 10*d*." Two years afterwards a curt statement of expenses indicates that the bridge was decorated on the triumphal return of Henry from Agincourt, with the captive French monarch in his train. In 1421 the bridge resounded with preparations for again welcoming King Henry after his victorious

tenanted by pen or needle-makers, and economical ladies were wont to drive from the St. James's end of the town to make cheap purchases." A bridge in a City like London, which is always growing, should possess the quality of elasticity. Old London Bridge was not designed to meet the unknown requirements of a remote period, and any respect which might be given to it for its antiquity could not keep the citizens from feeling that neither the roadway nor the waterways were adapted to meet the traffic of London. The Corporation expended large sums on the structure, but when it was found that in 1811 the fall of water at times was no less than 5 feet, and in consequence lives as well as property were lost, it was plain the time had arrived for the removal of the old bridge. The history of the new bridge and of Blackfriars and Southwark bridges is narrated by Mr. WELCH, whose volume is the most important contribution to the history of London which has appeared of late years, or since Mr. RILEY'S "Memorials" was published. The pages are typical of the great City in which antiquity and modernity are combined to a degree that is without parallel.

AN IRON RESIDENCE ROOF.

THE new residence of John Jacob Astor, at Fifth Avenue and Sixty-fifth Street, New York City, fronting Central Park, occupies, says the *Engineering Record*, an area of 155 by 125 feet, and including the connected stable is almost a continuous building. The arrangement of main walls is that of three sides of a hollow square four and five storeys high, built of marble and brick masonry with iron and steel framework and girders, arched floors, flat and domed and vaulted ceilings on metal elements. It is covered with mansard roofs of 41-feet and 36-feet spans over the west and south street fronts respectively, a half mansard roof of 36-feet span over the north lateral part, and gable or deck roofs between and adjacent to these, 57 by 41 feet over the picture gallery, 40 by 35 feet over the stable and several smaller surfaces. All are of fireproof construction with stiff-riveted steel and wrought-iron trusses, girders, deep-rolled beams and framing, and slate, tile and copper covering. This covering has been carefully designed by a bridge and iron construction specialist to conform to the complicated intersections and irregularities of the finished structure, and also to afford required proportions and sections for the computed weights, loads and wind strains, as well as adaptability to modern shop practice, strength of connections, simplicity of detail and convenience of erection. The hips, valleys and rafters intersecting at all angles formed numerous complicated and intricate connections, each requiring distinct treatment. The main interior walls are of brick anchored firmly by iron bars to the outside walls at their points of juncture. These walls are furred with fireproof brick, of which also the lighter interior partition walls are constructed. The first four floors rest on the brick walls, while the fifth is in the roof. The floors are of steel beams 12 to 20 inches deep, and filled in between with flat burnt clay arches 8 and 12 inches deep.

The main roof is at an approximately uniform height and is U-shaped in plan, the base being in front, 114 by 41 feet, and the lateral parts each 125 by 56 feet, having at the corners of the front towers at the north-west and south-west extremities, each one 41 by 33 feet at the base, 33 feet high, and 21 by 13 feet at the top. These roofs enclose one 50 by 41 feet over the main hall, and have a mansard front both on the streets and overlooking the lower roofs of the inner square. The outer fronts are 25 feet high, and the trusses are designed to avoid producing any horizontal thrust on outside walls or columns. To this end the feet of the rafters are tied to the ends of the floor beams, which are intended to distribute any horizontal strains over the whole structure. The inside rafters extend to the 12-inch court wall, but are supported from iron columns so as not to load it, but to transmit the roof weight to the floor girders. The nearly horizontal top rafters have T-bar purlins 19 inches apart, which support terra-cotta blocks upon which the copper sheathing is laid. The steep pitched sides are slated on horizontal angle bars rivetted to the rafters 6½ inches apart. The main roof has a level ceiling throughout, formed of 2-inch blocks, resting in tees suspended from the tie-rods of the trusses. The stable roof is a single mansard similar to the north side of the main roof. The "suspended" ceiling is formed of 2-inch tees, spaced 18½ inches, attached to 3-inch angles every 5 feet, and which are suspended by bars from the rafters. The ridges between the flat and the steep roofs are covered with a copper cornice supported by angles bracketed to the rafters. The upper edge of the cornice is turned over and attached to the sheet-copper roof sheathing so as to be continuous with it. At the sides it runs down over a couple of



OBVERSE.

REVERSE.

ANCIENT SEAL OF THE BRIDGE HOUSE.

campaigns across the Channel. The giant's head was replaced by a newly carved one, images were repainted and gilded, stores of tinsel were purchased, gaily-coloured costumes of linen were prepared for bevy of maidens who should greet the hero; so great was the press of the work that artificers toiled day and night. In the spring of 1427 a similar excitement prevailed before the return of the great Duke of Bedford from the French wars. "Crokis" and "pastoral" sticks were purchased for idyllic scenes. Ornamental turrets were erected, and groups of juvenile choristers were trained to sing to the accompaniment of organs. The effigy of a princess, surrounded by attendant ladies, stood in a prominent position, and attached to the figure was an inscription consisting of David's words, "Dux itineris fuisti in conspectu ejus et plantasti radices." Twelve other effigies of celebrated personages were fixed on the bridgeway, and corresponding shields bore appropriate arms and names. The curious list of heroes deserves repetition:—Abraham the Patriarch; Isaac the Patriarch; Jacob the Patriarch; Joseph, Prince of Egypt; Moses, leader of the Hebrews; Joshua, leader of the sons of Israel; John, Duke of Bedford; Judas Maccabæus; the centurion of the Roman Senate; St. Alban the Prince; Henry I., Duke of Lancaster; Hector, Prince of Troy; Hercules the Prince.

As a contrast with the splendour and colour of the fifteenth century we have the description which PENNANT gives of the bridge in the eighteenth century:—"I well remember the street of London Bridge, narrow, darksome and dangerous to passengers from the multitude of carriages, frequent arches of strong timber crossing the street from the tops of the houses, to keep them together and from falling into the river. Nothing but use could preserve the repose of the inmates, who soon grew deaf to the noise of falling waters, the clamour of watermen or the frequent shrieks of drowning wretches. Most of the houses were

slates and is turned under and fastened back to the angle purlins.

The slates have a hole pierced through each side near the top, through which nails are clinched around the purlins, or copper wire ties are fastened. Each slate is set in cement above the exposed surface, and provision is made to drain off the moisture that collects between them through an iron pipe fastened to the hip rafters by bent clips and light castings and supporting the hip mouldings, the outside edges of which are also tied to the angle purlins. The rafters all rest at the bottom on a continuous cast-iron cill, at the outer edge of which a vertical webbed rolled channel is fastened to support the galvanised iron gutter frame, which is lined with copper, the copper passing up under the slate and fastened to the angle purlins. The dormer windows of the fourth storey have stone fronts on, the walls and terra-cotta blocks in the iron side frames, which are covered with slate or copper and have copper roofs. The large Fifth Avenue dormers have elliptical side windows 3 feet 9 inches by 2 feet 8 inches in each wall. Many of the fifth-storey dormers are semicircular in plan, and all of them are set entirely in the roof and are built with iron frames of angles and tees, into which fits an ornamental copper front that runs under the slates and covers the top and sometimes the sides.

The total amount of iron and steel in the building is about 700 tons. Mr. R. M. Hunt is the architect. The design, construction and erection of the ironwork was under the supervision of Mr. A. R. McKim, C.E.

TESSERÆ.

The Design of the Escorial.

THE foundations of the palace of the Escorial were laid in 1563, when the Baron Martirano being at the court of Philip II., and being much esteemed by that monarch as of acknowledged taste in the arts, he was consulted in respect of this important building, and commissioned to return to Italy to advise with the most celebrated architects of the day, Galeazzo Alessi at Genoa, Pelegrini Tibaldi at Milan, Palladio at Venice, and the Academy of Design at Florence. The grand duke Cosmo di Medici also ordered a design to be made by Vicenzio Danti. No less than twenty-two designs from different architects were collected on this occasion, but it is stated that none were so well received by the King of Spain and Martirano as that by Vignola, who, having had all the designs sent to him for his inspection and judgment, selected the best parts of each, and thus dressed up a description of olla podrida design for his most Catholic majesty. This at first sight does not appear to have been a very creditable proceeding on the part of the architect, but at this distance of time it would hardly be just to venture a censure without having all the circumstances of the case before us, and as the character of Vignola for honour and integrity has never been impeached, it is only fair to presume that he did nothing unworthy of it in this transaction. Philip invited Vignola to proceed to Spain to superintend the execution of his design, but finding himself advancing in years, and being much occupied with his professional duties (more particularly with those pertaining to St. Peter's), he prudently declined the royal invitation, and determined upon continuing in his favourite Rome. The Escorial, according to Milizia, was afterwards erected by Giovanni Battista, of Toledo, who commenced the work in 1563.

Early German Brickwork.

In the early examples of the brick style, the more elaborate parts, including the tracery of the windows and other moulded work, were executed in stone. Horizontal bands of stone were also occasionally introduced, and they have a good effect in tying together the different parts of the composition, besides their value in a constructive point of view. But in the later examples from the end of the fourteenth century stone is entirely dispensed with, and we find even such parts as crockets and finials executed in brick. The use of dark brown or black glazed bricks was also common during the later period. The character of the mouldings varies, of course, somewhat in the different periods, being simpler in the earlier, and more elaborately subdivided in the later. Delicacy of profile can hardly be expected from the nature of the material. Moulded bricks were also used to make up general forms, such as circular piers, the inner side of circular turrets, &c. There are a few points in the construction of the buildings which ought not to be passed over. There is usually a granite plinth carried all round the churches, and the towers are faced with the same several feet up. The absence of buttresses to the towers rendered it necessary to increase the thickness of the walls, which we find is very considerable, notwithstanding which they mostly incline from the upright, and it is remarkable that this occurs most frequently towards the south-west. The mortar joints are invariably very wide (from $\frac{3}{4}$ -inch to

$\frac{3}{4}$ -inch, or even more); the mortar itself is extremely hard. The construction of vaulting claims particular attention. In the first place, a light material was prepared in bricks, moulded of a wedge form. The ribs seem to have been first constructed independently as a skeleton, and between them the spandrels were filled in with the light bricks, apparently without the use of centreing, as each spandrel is considerably arched up to enable it to support its own or any superincumbent weight. Thus the vaulting rests entirely on the ribs, which are not tailed into it. It is a single brick in thickness, about 6 inches, and is backed up only a very short distance above the springing, so that the form is very distinctly seen on the upper surface, where it presents a very remarkable appearance. The bond used throughout is the Flemish, or, as it is now called, the cross-bond. The arches are always built in half-brick rings. The bricks used in the buildings are of a larger size than those now commonly used in Germany. They are remarkably hard and sound, and are rather heavy. Though externally of a brown red colour, the inside is grey, like our stocks. This is not the case with those now made. The light vaulting bricks were made with a mixture of chopped straw, so that when burnt they were porous, but of sufficient strength for their purpose. The first-class bricks, as a material, are superior to those used in this country; the colour uniformly red, except where a vitreous action had been produced in the burning. There did not appear to have been a rubbing down of the face of the material when used for mullions or tracery—the ordinary examples presented too rude a surface to suppose such an operation.

Gas Lighting.

In 1792 William Murdoch employed coal-gas for the purpose of lighting his house and offices at Redruth, in Cornwall, and this appears to have been the first idea of applying the light to useful purposes, although the gas had been discovered and obtained both naturally and artificially more than half a century before. He had also a gas lantern in regular use for the purpose of lighting himself home at night across the moors from the mining engines that he was erecting, to his house at Redruth. This lantern was formed by filling a bladder with gas and fixing a jet to the orifice, which was attached to the bottom of a glass lantern, the bladder hanging underneath. After various experiments, whereby he proved the economy and convenience of light so obtained, he made a public exhibition of it by lighting up the front of Boulton's manufactory, at Soho, on the occasion of the general illumination for the Peace of Amiens in 1802. He subsequently lighted up some cotton mills at Manchester, beginning with that of Phillips & Lee; and he published a paper describing the advantages in the "Philosophical Transactions for 1808," for which the Royal Society presented him with their large Rumford gold medal.

The Mole of Hadrian.

Procopius is the first who gives any description of what it was, in his account of an assault made by the Goths outside the Aurelian gate (that is, not far from where the Imperial Gauls of 1849 made their assault). He thus writes:—"The tomb of the Emperor Hadrian is situated outside the Porta Aurelia, about a stone's cast from the bulwarks of the city; it is an object worthy of admiration. It is built of Parian marble, and the blocks fit close to one another without anything between to fasten them; it has four equal sides about a stone's throw in length; it rises above the city walls; on the top are statues of the same kind of marble, admirable figures of men and horses. The men of old time (that is, the Romans probably in the time of Honorius) joined this monument with the bulwarks of the city by two walls, because it appeared advantageous for the defence of the city; it thus became a part of the fortifications and had the appearance of a lofty tower covering the entrance of the city." So far we learn that the mausoleum was converted at a very early period (for Procopius saw it in 534 A.D.) into a fortress. Those beautiful statues, however, which the Secretary of Belisarius describes, were put to a strange use by the defenders of Rome. Instead of more appropriate missiles and more raw material, these masterpieces of sculpture were torn from their pedestals and hurled upon the besiegers below, and perhaps the breaking of the head of a Goth might cost a whole Venus or a Mars, a head of a Faun or a foot of Hercules. What are we to say of a passage cited by Salsmasius from John of Antioch, who lived A.D. 620? "The figure of Hadrian," he says, "stood on the top in a car drawn by four horses, of such colossal dimensions that a full-grown man might pass through one of the horse's eyes." A chronicler of the thirteenth century, commonly called the Anonymus, says that the tomb was faced with marble, and he talks of gilded peacocks and a bull. The same Mediæval sightseer mentions also bronze doors and horses, which he saw about the mausoleum. But the earliest representation or drawing we have of the Mole is that now existing on the bronze doors of St. Peter's, made in the days of Pope Eugenius, by Antonio Pollagio, about 1481.

In Camucci's sketch, made a century later, some of the cornice is indicated which he must have seen, and which he says was embellished with ox heads and festoons, and on the frieze there were two inscriptions then to be seen belonging to Commodus and Lucius Verus. Pope Clement VII. and his architect Labacco gave currency to the tradition that the beautiful columns of pavonazetto, which stood in St. Paul's Basilica, once adorned the upper storeys of this mausoleum. Now with these notices of historians and artists of old time, added to our own observations of its present state, we are to make the description, both external and internal, of this durable monument. The mausoleum was formed of a square basement, which measured 253 feet on each side, making a perimeter of 1,012 feet. The door, or entrance, was in the middle of the south side, facing the passage across the bridge. At the four angles of this solid basement were colossal statues or trophies—we may suppose them to have been those horses which are mentioned by the monk of Antioch; in the centre of this massive foundation, which was adorned by festoons and bucrani, rose the round tower, which still, in a great measure, exists and serves as the donjon or keep of the castle. This tower did not diminish towards the top as some have supposed, for Procopius measures the diameter at the top by the same expression of a stone's cast as he measures it at the bottom; though diminished by all the marble facings in width, it still yields a diameter of 188 feet. The round mass was compacted together of peperine stone and the usual materials employed in solid Roman works, but it was all faced with square blocks of Parian marble. We must accede to the generally received opinion that two magnificent colonnades went round the monument, dividing it into two storeys, and that statues stood in the intercolumniations. Those statues were probably *chefs-d'œuvre* of art. The famous Barberini Faun, which was found by the pontiff of that name in a ditch of the fort, is a specimen; the Dancing Faun in the Florentine Gallery is another; these had either fallen from their place or had been used by the troops of Belisarius for overwhelming their assailants.

The Balbi Palace, Genoa.

One room, about 20 feet square, which serves as a sitting-room, is very beautiful. It has one large gold cornice with ornament tinted brown, a vaulted roof; the frieze is large and painted with richly coloured designs of figures, centaurs and women, dark and rich in the Venetian style. In place of an architrave there is a large ovolo moulding, also gold. The walls are of bright red, or rather dragon's blood. The pictures have plain gold frames; the doors have a golden canopy, from which hang dark red velvet hangings, plainly hemmed with a border of the darkest stuff (red); there is a die all round of which the general tint is light brown, and a golden cyma moulding runs round it and doors into red wall; there are two windows. It is remarkable that this room when seen in the heat of summer does not look hot. The groined roof with its allegorical figures is, however, faulty.

House-Painting in the Seventeenth and Eighteenth Centuries.

In 1671 it was agreed that the wainscot in the hall of the Carpenters' Company should "be handsomely painted, and the walls above the wainscot on the south side hung with painted cloth of some neat painting work suitable to the front side." A French traveller in England in 1672 remarks that "the houses of Canterbury are well built and painted after the Dutch fashion." For many years after 1700, the following description from a work of the period will convey some idea of the extent of painting practised. "Outdoor painting for doors, shop-windows, window-frames, pediments, architraves, friezes and cornices, and all other exposed timberwork, ought at first setting up to be primed with Spanish brown, Spanish white and red lead (about a fifth part) to make the other two colours dry, ground in linseed oil; then again with the same colour, only whiter; and lastly with fair white made of lead, and about a fifth part in quantity (not weight) of Spanish white." "Wainscot colour," "white colour" and "walnut colour" are enumerated; also "ordinary branched painting" and "plain japan, either black or white." On considering this recital of painter's work we may assume that these wainscot and walnut colours were used for the purpose of making woodwork resemble those woods. An interesting account has lately been published of a lady of rank, who in 1612 or 1613 appears to have entirely changed the fashion of the arrangements of houses in France, and to have been the first who painted rooms in any other colour than red or tawny. The next and last item in the description is "whiting and colouring on plasterer's work." The combined use of "colour" (distemper) for interior work, down to so late a period as 1700, accounts for the extensive use made of it in our churches. It is clear that from about 1700 oil paint became a disguiser of materials, and we know from his own description that the interior of St. Paul's Cathedral was painted under Sir Christopher Wren's direction. In a work of 1703, the contrivance of closets in most rooms and painted wainscot are mentioned as two great improvements. Perhaps

the first intimation of oil paint being used to a large extent internally is in a "Compendium" of 1721. It states that the taking of the dimensions for painters' works within doors is the same with that of joiners', by girtings about the mouldings and members of cornices, &c.; but the painter never requires work and half work as the joiners do, but reckons his work once, twice, or thrice primed or coloured over. Wood, in his History of Bath, says "that about 1727, if the walls of any of the rooms were covered with wainscot, it was with such as was mean and never painted;" as the new buildings advanced the rooms were all wainscotted and painted in a costly and handsome manner. Ware, in 1767, writes that "fir, as it is cheap and works easy, since the use of paint has become so frequent, has in a manner superseded all other kinds." In the descriptions of buildings given at the end of his work, he specifies that the walls are to be rendered and fronted for hangings, and paints all the wainscotted rooms a "common or stone colour" three times in oil. In 1775 a large mansion in the country is stated to have paper to the ground-floor rooms, whilst the walls of the bedrooms, garrets and basement were limewhited. And at the beginning of the present century, says a later writer, the houses of traders and middle classes, particularly in the provinces, were chiefly adorned with simple washings of rose pink, whitening and size. A friend, now in his eighty-fifth year, remembers the lining to walls being left unpainted, and much of the woodwork even to the rooms connected with the Houses of Parliament was also of plain deal. The plastered walls of houses were coloured, the sashes painted white, the door-skirtings and other parts generally black. Several people can no doubt recall many houses in the country still exhibiting this ancient style of ornamentation. Thus we may conclude that house-painting, or, as it has been very descriptively termed, the "three coats and flat work," did not come into fashion until about the period of William and Mary, and Anne, up to which time either colouring by distemper or by whitewash had been in vogue for plasterwork, leaving inside woodwork more or less untouched.

Geometrical and Decorated Tracery.

The first impression conveyed by a Geometrical window and a Flowing Decorated window, side by side, is that while the former is obviously drawn wholly with the compasses, the latter seems at least to be drawn in some degree *libera manu*. Perhaps this impression, so far as the Flowing Decorated is concerned, is hardly correct; but there is little doubt that it results from certain appreciable causes, and indicates a real difference of principle in design. Take the simple Geometrical and an equally simple flowing two-light window. The eye at once detects the use of the compasses in the one, and the very centres from which the curves are struck; in the other no single curve is sufficiently simple to be referred, except with considerable effort, to its centre or centres; it seems, indeed, to be drawn without any mechanical aid. Take more complex arrangement, and still the same character is found carried out through 3, 4, 5, 6, 7, 8, 9 lights. This alone, it seems, is sufficient to demand a separation of the two styles; for in speaking of design, this very fact, that the designer is put into so different an attitude as that of one who is limited wholly to geometrical forms, and of another who allows himself, or seems to allow himself, the license almost of a sketch, is surely enough to separate between them. But the free hand of the later designer had its rules too, and those rules were apposite to those of his predecessors. In designing a Geometrical window the architect adhered to true circles, or parts of true circles, never flowing off into another curve struck from another centre. The ogee was unknown. Cusps were of circles, or parts of circles, struck from circles within the greater circle, independent of one another, but with absolute dependence on the centre of the first circle; these points were cut off by another circle, concentric with the first, or that which circumscribed the whole figure. Hence a transparency of purpose and a precision of effect in this style never afterwards attained. All is complete in itself, and each member perfect, either as a part or as a whole—a character which Professor Whewell abundantly recognises when he calls the Geometrical Complete Gothic. It must be confessed, however, that something of sameness and of restraint resulted from the use of the compasses, restricted by so narrow laws. This was remedied in a subsequent development of the same style, which let in far greater variety, sometimes amounting almost to license. Indeed, though the forms must have often struck us with surprise and pleasure, they have never yet been fully appreciated. Mr. Sharpe, in his work on "Decorated Tracery," alludes to them thus equivocally:—"Towards the close of the Geometrical period there occurred some attempts at originality in the designs of window tracery. Becoming apparently dissatisfied with the extreme formality of the usual geometrical forms, several fanciful experiments were tried by the builders of this period, which, without betraying any symptoms of impending change, present—under forms which may still be termed Geometrical—very little similarity in their general outline to the (former) examples."

ST. NICHOLAS CHURCH, PYRFORD.

ST. NICHOLAS CHURCH, Pyrford, Surrey, is a small building of stone in the Early Gothic style, consisting of nave, chancel, north porch and low western tower of wood with spire. It is picturesquely situated on a mound, from which can be seen a charming panorama of Surrey meads intersected by winding rivulets, in the centre of which are the ruins of the antique Newark Abbey.

It is a small building of flint and ironstone rubble-work, with dressings of chalk and firestone. It is in plan scarcely altered from the form in which it was built towards the end of the twelfth century. The side windows of the chancel (one of which has been altered externally in later times), the chancel arch, the north and south doors of the nave, and the two small windows in the west end all belong to this date. Of these features the north door alone is ornamented, the others are extremely simple. The north doorway is designed with zigzags in the arch and detached shafts in the jambs, one of which alone remains, the other having

other woods, and framed with carved oak styles and rails. On the front panel are the initials N. B. and the date 1628.*

Before the late restoration the pulpit was covered with thick white paint; much of the carving and all the inlaying were discovered when this was removed. The base having disappeared, a new one has been supplied. Some decayed panels also have been restored.

The only specimen of old glass remaining in the church is that which fills the quatrefoil in the end of the fifteenth-century east window. It represents the Holy Trinity, and appears to be nearly, if not quite, coeval with the tracery of the window.

Throughout the church during the restoration were found traces of painted decoration. A few figures and ornaments were saved, including two consecration crosses in the chancel and one in the nave.

Two systems of decoration were observable, corresponding with the dates when the church was built and restored. The later system being on a tender coat of whitewash, none of it could be preserved. Its removal exposed the earlier



been cut away to form a story in later times. The church seems to have been thoroughly restored in the fifteenth century, when two-light traceried windows were inserted in the east end and the side wall of the nave, replacing no doubt small early windows. At the same time the present massive roofs were constructed, also the oak pews, of which, when the church was restored a few years ago, the greater number were repaired and kept, though sadly mutilated by the addition of high tops. The simple and beautiful north porch belongs to this date.

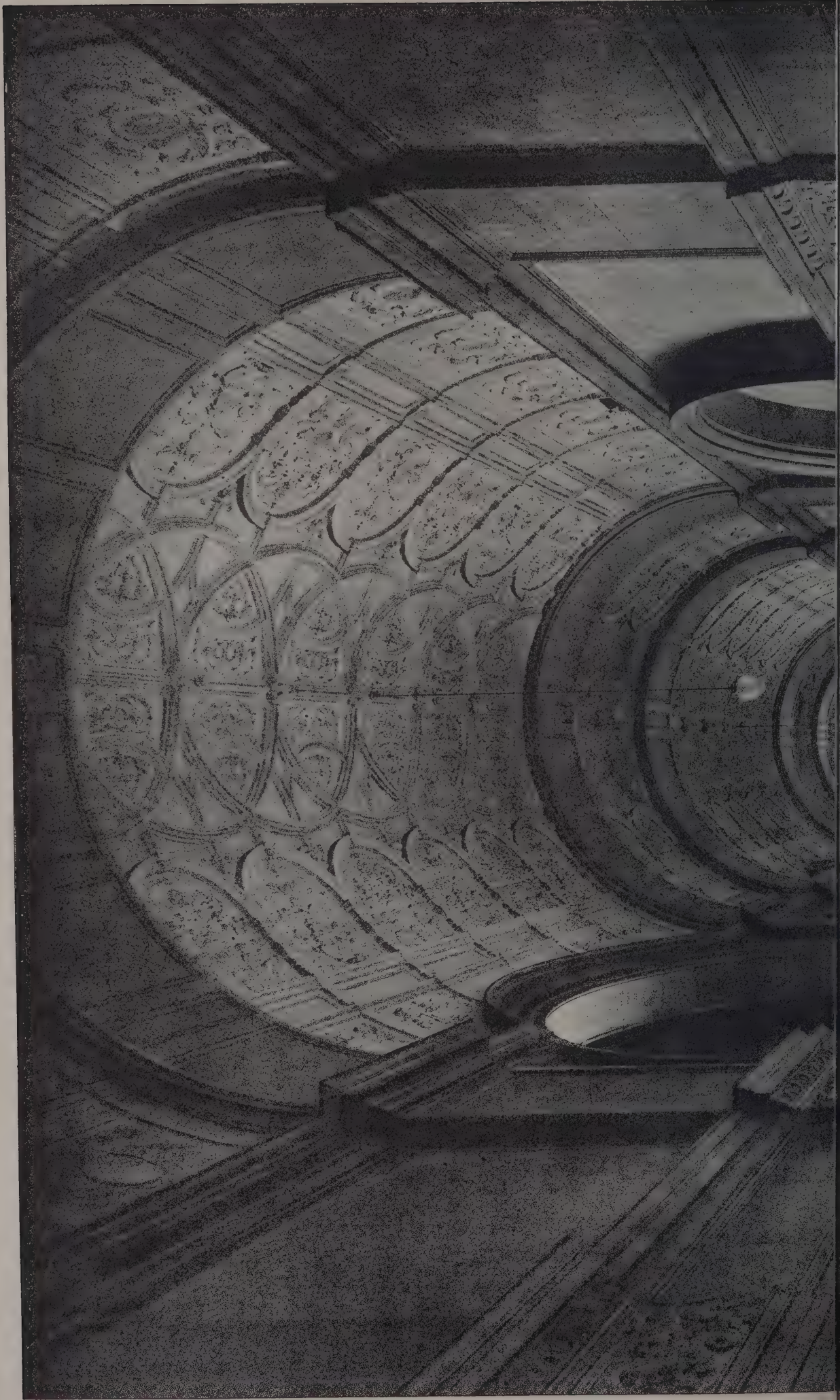
The canted roof of the nave seems to have been originally open to the underside of the tiling, except that the wall plaster was continued up the first or vertical cant till it met the tiles. That this was the old arrangement is evidenced by the traces of colour found on the upright plastering, and also by the evidence of the panelled ceiling.

At the eastern part of the nave roof exists a canted or waggon ceiling covering the three end rafters, formed of wide feather-edged and grooved boarding nailed to the underside of the rafters, and bordered with simple battlemented mouldings. It is painted with yellow flowers and rosettes on a red ground. The pulpit is a very beautiful Jacobean work, formed of simple deal panelling inlaid with

system of decoration painted on a harder plaster. The original drawing was exhibited in the last Black and White Exhibition.

THE death of M. BIDA, whose fine illustrations of the Gospels are appreciated in England, has caused the revival of a story connected with one of his drawings. In 1867 he exhibited a drawing in the Salon called *Solomon's Well*. It was purchased by a dealer for 6,000 francs. Soon afterwards, Baron JAMES ROTHSCHILD expressed a desire to possess the drawing, and told the dealer to fix the price for it. The dealer declined to sell it, but he offered to present it to the Baron on consideration that his admiration for the drawing should be expressed by sending a cheque for 2,000l. to the artist. The arrangement was faithfully carried out. ALEXANDRE BIDA was one of the most refined draughtsmen of the century. He ought to have gained a high position as a painter, but he had a natural aversion to colours. He died in his eighty-second year.

* It is not known who N. B. was, as the registers only go back to 1666.





PHOTOGRAPHED BY BEDFORD LEMERE & CO

WEST CORRIDOR, IMPERIAL INSTITUTE.
T. E. COLLCUTT, Architect.

INK PHOTO. SPRAGUE & CO 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.





INK-PHOTO SPRAGUE & CO. 4 & 5 EAST HARDING STREET, PETTER LANE, E.C.

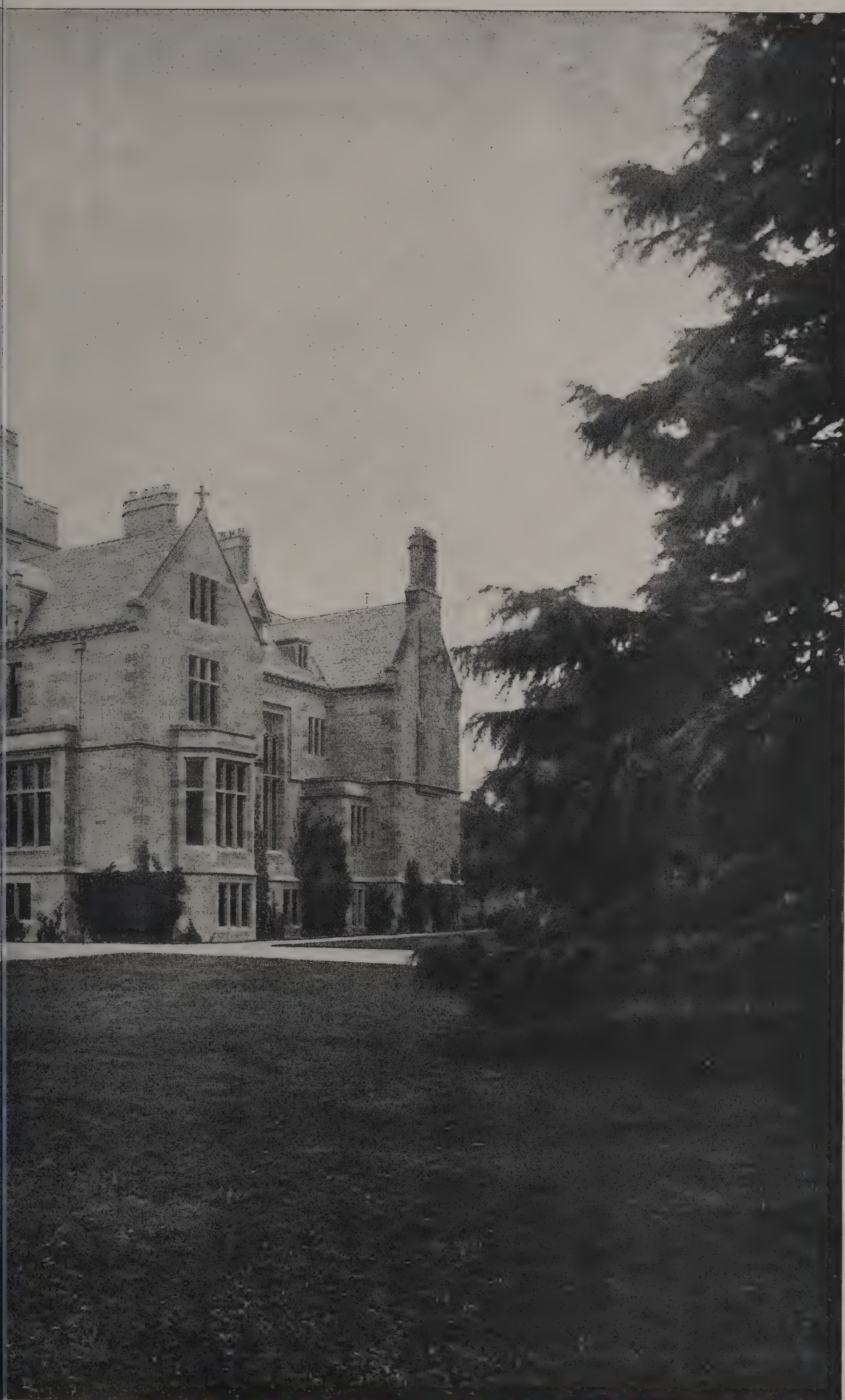
THE HISTORY OF CLOVIS, Nº 2.

THE ATTACK RENEWED BY THE FRANKS.

FROM THE WALL PAINTING IN THE PANTHÉON PARIS



Jan. 11th 1895.



INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

E, FORFARSHIRE.
TON, Architect.

Ölva Architekt, Jan: 11^{te} 1895.





INK PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, PERTH, W.A.

COUNCIL CHAMBER, PERTH.
The late ANDREW HEITON, Architect.

ILLUSTRATIONS.

THE HISTORY OF CLOVIS.—NO. II.

THE second compartment of M. JOSEPH BLANC'S work in the Panthéon depicts the renewal of the battle which, according to the legends, changed its character owing to the co-operation of the heavenly warriors. The artist has not attempted to give a symbolic character to the incident. Battle-pieces rarely resemble battles, but the picture within a limited space and with a very few figures is a suggestion of a fierce onslaught.

HALLYBURTON HOUSE.

THIS building was designed for Mr. ROBERT STEWART MENZIES by the late Mr. ANDREW HEITON, of Perth. It was completed at a cost of 13,000*l*. A view of the banquetting-hall has already appeared in *The Architect*.

COUNCIL CHAMBERS, PERTH.

THE Perth Municipal Building was another of Mr. HEITON'S works. Although it has the effect which is needed in a town having so much historic interest, the outlay was moderate, being only 13,000*l*.

WEST CORRIDOR, IMPERIAL INSTITUTE.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening, Mr. F. Hooper in the chair. Mr. C. G. HARPER read a paper on

Architectural Illustration.

In the course of it he said:—Illustration has in these days become so widespread that the pictorial presentment of every imaginable, and indeed of every inconceivable, thing is taken as a matter of course and as the daily routine in places where, but some fifteen years ago, pages of written description would have been devoted to the explanation of a subject—and even then with but indifferent success.

It is not, however, upon illustration as a whole that I would address you to-night, but only upon that branch of it comprised within the title of this paper. And in addressing you upon one of your very own subjects, I feel that for one who, like myself, is not, nor has ever been connected with your profession, the uttering of opinions before so technical and specialist an audience as this might easily be construed as an impertinence, were I not at once to repudiate anything that savoured of architectural authority. Therefore, I pray you be minded that although by reason of experience I claim the right to speak upon "process" reproduction of drawings, yet it is only with the greatest diffidence that I venture to address you upon actual draughtsmanship or the vexed question of style.

Since the first introduction of the perspective sketch into the work of architects' offices and into the pages of your professional newspapers, the question of style in drawing (and more especially in architectural illustration) has been always more or less under discussion, but never, perhaps, so constantly as now. I have ventured, in the pages of a technical treatise upon "Drawing for Reproduction," which I have been guilty of writing, to remark that this is, in a peculiar sense, pre-eminently the age of the picturesque, and if I repeat that remark here, it is because what was meant for artists in general in the pages of that book may most fitly be re-echoed in this place before a gathering of architects, to whom the picturesque, and the demand for the picturesque, mean much. Gentlemen, I begin to hate that poor battered word—knocked out of all real sense meaning nowadays—as much as you doubtless have hated it for some years past. For the architectural profession the picturesque has meant a wild riot of crow-stepped gables, perilous-looking pinnacles and all the crazy apparatus of the moated grange. Now the moated grange, the survival of the centuries, that lovely time-mellowed jewel of our shires, is a beautiful possession, and its charm is not to be over-estimated; but its braggart ready-made imitation, whether in architectural design or in periodical illustration, is nothing less than a miserable affectation. We will not stop to consider whence comes this strange craze—whether we owe it to the Christmas numbers of years since, or to what else—but we may deplore the intrusion of this so-called "picturesque" quality into the architectural illustration of to-day.

Years ago when the measured elevation was the utmost that your professional papers attempted in the way of illustration, the artists among you groaned in spirit at these bald and altogether artless productions of the architectural drawing office, and sighed for perspective views. Well, nowadays you have your perspective views—and the picturesque is cheap to-day. Architectural illustrators, lay or professional, whether

they be working for a technical audience or for public approbation, will be romantically "picturesque," no matter what their subject. The spirit and feeling of any particular subject, truth, reticence, dignity, and every sober quality may go hang, so only they may run riot in "picturesqueness." They have made the appellation hideous; so much so, indeed, that if you forgive me the frequent employment of that offensive term, it will be no little exercise of charity that urges the absolution. It is, however, by iteration that I would draw your earnest attention to the enormity (no less a term will serve my turn) that falsifies architectural illustration, until nine-tenths of the work done to-day is arrant and ill-judged convention. Restraint is at a discount in illustration and design. The eye is wearied and the senses stunned with the picturesque, and should your modern illustrator, by some unkind fate, have professional relations with that place of despondency and despair—I name Gower Street—he will render that depressing thoroughfare as a very Nuremberg for picturesqueness. Perhaps you will say "all praise to him for so stupendous an achievement," and I would allow the *tour de force*, but not the morality of it. I saw but the other day an illustration of an exquisitely simple, and yet most striking, house in Queen's Gate, a modern house doubtless familiar to you as architects, a house which even a layman, like myself, can identify with Mr. Norman Shaw. That house, in its Georgian restraint and precision, its four square red-bricked walls and its green-shuttered windows, wears a noble and stately look that puts to shame the stuccoed respectability of the '60's across the way. Quiet dignity is the note of that house, but the frantic draughtsman who illustrated it revelled in spots and blots and a romantic decrepitude that deprived the architect of all the credit due him for his reserved force, and left no vestige of quiet there. This class of draughtsmanship is almost exclusively penwork, and it had at one time the merit of a cunning use of black and white. To Mr. Herbert Railton, with whom it originated, belongs the credit of using the pen with vigour and effect; but in these days the excesses of this manner and the convention in which these drawings are executed would lead one to believe everything was going up to kingdom-come in a dynamite explosion. They have already brought it into discredit.

This is no plea for a bald and merely matter-of-fact style of drawing. Some of your most distinguished architects have wielded a most poetic pencil, and one cannot object to poetic feeling in draughtsmanship. Only, no one requires the high-strung epic flights rehearsed by these extremists.

While art remains a matter of temperament and individuality (as it must ever remain), I would urge you to seek your own salvation in methods of expression, and to take no man's advice as to the style and manner you should adopt in drawing. The world is echoing with advice of one sort and another to-day, and because so many take these hints and precepts for very gospel, much of our modern work is so unoriginal and hackneyed. Better be damned for one's very own sins of omission and commission than for the mistakes of others. For see the folly of it. One man may as readily as another listen to the views and appreciations uttered here and printed there and repeated somewhere else; and should one do so, why not an hundred? And so round the same vicious circle of copyism and hero-worship. At no other time was there so much good work produced as now, in all sorts of departments, and, for the matter of that, at no other period has there been such a tremendous output of the vilest work. But singularly enough, the worst is the most insistent. It rises, like scum, to the top and flaunts itself in the most public places and becomes, with the artless, a model for repetition. Whack one of the objects of your hero-worship and he roars like the bronze Buddha at South Kensington, and for the same reason—that he is hollow and empty. Let every man be his own hero and a law unto himself. First, however, you must learn the grammar of your art, so that you do not transgress its fundamental rules nor exceed the limits of a particular medium. Originality is one thing, license quite another. I do not urge you to be original in order that you may produce something as stupendously shocking in illustration as George IV.'s Brighton Pavilion was in design. The originality that reared either that or the Savoy Hotel—that hideous caravanserai upon the Victoria Embankment—is altogether to be deprecated, and the man who designed Queen Anne's Mansions deserves, I take it, nothing less than eternal contumely at your hands. And let us always bear in mind that each medium has its own peculiar and inimitable strength; that a pen drawing cannot and ought not to compete with wash, crayon, or pencil; nor for that matter should etching be brought to imitate engraving. Processes other than lithography have hitherto had little interest for the architectural draughtsman, for his work has been chiefly reproduced in the pages of his technical papers, and they as already mentioned use chiefly that one method. But now that all kinds of process work are becoming cheaper, it is not unlikely that in the near future these papers will use a larger variety of methods than they have done hitherto. At any rate, I judge it will be of interest to show some reproductions of pen

drawings made for book illustration, and have hung here some six frames that exhibit at one glance the drawing and the reproduction. Here are drawings made with ebony stain upon paper and cardboard, and reproduced by line processes and by tone. Most of these drawings are made with a pen, and I have selected them especially because I think line-work is of more interest to you than wash.

Here is an essay in the application of the mechanical tint known as "Day's Shading Medium," an invention which may be succinctly indicated by saying that the shaded effect is produced from engraved sheets of gelatine bearing a close concourse of dots in relief. These gelatine sheets, when inked up with a printer's roller and pressed with thumb and finger upon the zinc plate on which the drawing is etched, produce the dots you see eventually upon the print. You have, however, nothing at all to do with that, but simply indicate to the process man by scribbling in blue pencil (or making a blue wash) on your drawing where you intend these dots to come.

But now to leave tints and come to quite a different matter. You will have noticed, no doubt, that the process man (and indeed many writers upon this question of reproduction) insists upon your drawing for line-process with as clear and sharp a line as possible. He will not hear of your leaving pencil marks upon your paper, but will tell you that every trace of pencil must be carefully removed before he can attempt to make a block from the drawing. Paper, did I say? Nay, he will not hear of the draughtsman using paper, but only cardboard of the whitest and smoothest variety. Now, this, of course, is done chiefly to make his work the easier, and in order to produce blocks that may show a sharp, clear line. Of course, there are many kinds of drawings where a line of this description is desirable.

At the conclusion of Mr. Harper's paper, Mr. F. T. W. Goldsmith read the following communication which had been received from Mr. Phené Spiers:—Whilst I agree in the main with Mr. Harper's interesting arguments, which deal with architectural illustration, as the paper is read before a society of students, I should like to point out that it does not necessarily follow that the class of drawing which is likely to be indulged in by the student on tour is that which lends itself well for illustration. I say it does not necessarily follow, because I recollect that one of the first and best publications in black and white was that which was produced in 1858 from the drawings of Mr. Norman Shaw, the result of his work as travelling student of the Royal Academy. These drawings, however, were not made for the purposes of publication, and it was only on his return that he was persuaded to allow them to be reproduced as architectural illustrations. I have never seen the original drawings, but it is possible that the lithographic reproductions were worked up to some extent to make their publication more popular. Now, I take it, the principal object the student aims at when making a sketching tour is to learn how to draw art, how to observe, and if he once gets into his head that there may be a third object, viz. that of publishing his drawings, he runs the risk of neglecting the first two. The accidental effects of fleeting shadows, the careful blacking-in of every brick in shade, and the picturesque effects of broken stone-courses exercise such influence on him that he has entirely forgotten the architectural design of the building he has drawn, and is only able to console himself with the reflection that he has, at all events, turned out a very pretty drawing, which is the admiration of all his brother students (and perhaps his lady friends), and will also do admirably for publication. I do not wish to discourage the student who desires to add to his laurels by the execution of drawings which will give him a chance of carrying off the prizes in the Architectural Association studentships, or adding to the value of the Architectural Association sketch-book, or of assisting in the illustration of architectural drawings in our professional journals. In fact, on the contrary, I not only consider such aims perfectly justifiable, but I think it may excite the student to much more serious work than he might otherwise have attempted. I do, however, lay great stress on the fact that his first and main object is to learn. That object may be attained in two ways, either by measuring and plotting on the spot, or by careful delineations of perspective drawings. The first method has been quite discounted by the reader of the paper, who even objects to the use of the T-square in the making of the perspective drawings. I think the student is justified in making use of any assistance in that way, provided that he does not become the slave of his drawing instruments. There are many buildings the distinctive character of which mainly depends on the absolute regularity of their vertical and horizontal lines or the parallelism of others. Excepting half-timber houses and other such picturesque structures, are there any which do not? And why should the student forego all the training he has received in the office and laboriously try to work without the ordinary instruments of the craft? Even with the T-square it is possible to draw an artistic line without taking to the expedient which the late Mr. Joseph had resorted to in Pugin's office, viz. notching all the T-squares,

or cutting pieces of cardboard in gentle curves to give a flowing line to the tiles of a roof. There are two types of drawing I would recommend to the attention of students about to travel. The one is that which was pursued by the late Mr. Wm. Burges, the other that of the late Mr. George Edmund Street. Mr. Burges happened to be very short-sighted, and was obliged to use opera-glasses to see at a distance. This made it difficult for him to make perspective drawings. He set to work, therefore, to measure and analyse the construction of the buildings he came across. He was not content with the external appearance; he virtually dissected a building or some distinctive feature of one so as to see how it was put together. On one occasion he measured portions of the choir of Beauvais, on another the flèche of Amiens, I think, both stupendous structures, which show that his short-sightedness did not interfere with his powers of observation. He took up any phase of art workmanship, and Mr. Krall, the ecclesiastical worker in metals, told me that Mr. Burges's designs for chalices, &c., were absolutely perfect, and showed in detail how every part was to be put together. Mr. Burges was led eventually to publish his drawings, which are in the library, so that you will be able to take note of his field of work. Mr. Street was the most prolific sketcher we have ever had. I met him once at Mont St. Michel, when he told me that he had measured the plan and made a perspective drawing of the choir of every important church in Europe. On a previous visit to Mont St. Michel he had not been able to get inside the church, as it was used for a prison, so that then he had to return (in 1880) to complete his series. I am not aware that he ever made use of his sketches; his object was to impress the buildings on his memory and to penetrate into the thoughts and reasonings of the Mediaeval builder. His sketch-book measured $8\frac{1}{2}$ inches high and $6\frac{1}{2}$ inches across, and he frequently drew across the two pages. He always drew freehand and never used india-rubber. This, however, necessitated far greater care in the first setting out. He was extremely careful in the profiling of his mouldings, the mass of which was always proportional to the structure as shown in his drawing, and he contented himself with only drawing one or two lines through. I published one of the drawings in my book on "Architectural Drawing," his son having kindly lent me the drawing for that purpose. I had to trace it for reproduction, so that it loses some of the artistic value of the original. It represents the tower of Andrieu Church in Normandy, I think, and although it is in perspective virtually, for the student it is worth more than a $\frac{1}{4}$ -inch scale drawing. Mr. Street's drawings were purely architect's drawings and would probably be quite unintelligible to an outsider. There is no doubt that he was passionately fond of drawing, but his main object was to store facts in his memory, which I recommend to the serious attention of students as their first consideration. If at any time any of you should wish to turn your drawings to account, then I would ask you to look through Mr. Prentice's work on Spain. In that case the drawings were made for the purposes of publication, but they are distinctly architect's drawings and probably do not appeal much to the general public.

Mr. J. PENNELL praised magazine sketches. Ruskin's drawings of architecture he admired. Mr. Mitchell's drawing of Durham Cathedral he thought was abominable. There was no light or shade. The architects of old cared for light and shade. He and others like architects strove to do what was right in architectural drawings, and took trouble in making their perspectives give an architectural drawing that all could appreciate.

Mr. W. S. WEATHERLEY said he hardly understood the drift of the subject of the paper, as it had been so wandering. They could not combine in one drawing what would make a picture, and at the same time satisfy an architect in detail.

Mr. HART expressed disagreement with Mr. Harper as to the two illustrations of the White Hart Hotel.

Mr. E. GREENOP proposed a vote of thanks to Mr. Harper, and said he had not quite understood what Mr. Harper's grievances were. Some of a series of cathedral illustrations that had been published were past praying for. He (the speaker) condemned illustrations that lack all artistic feeling by reason of giving too much attention to minutiae of detail.

Mr. H. RAILTON was surprised that Mr. Harper should dare to speak of architecture. Few persons could construct architecture on paper. Many a person might suppose he could draw architecture, but few could show construction in two lines, of a Tudor, Geometric or Early English period. There were persons who could do it—Mr. Millard, Mr. Horsley and several others, men who had been trained in an architect's office. As an artist, Mr. Pennell drew architecture pictorially; they, on the other hand, drew it as architecture. Those who lacked the grip and knowledge of architecture had no right to dictate to architects about architectural drawings, though architects would welcome criticism from trained architects.

Mr. J. OSBORN SMITH said that accuracy was necessary in architectural illustration. No meritorious part of architectural drawings was more gone against by popular artists than

accuracy—false representations of the originals without beauty.

Mr. GOLDSMITH having seconded the vote of thanks, it was put to the meeting by the Chairman and passed.

Mr. HARPER returned thanks, but did not reply to the strictures that had been passed on his paper.

SIR C. L. EASTLAKE ON THE DECORATION OF HOUSES.

(Concluded from last week.)

Drawing-room.

BUT the choicest works of taste should unquestionably be in the room most occupied in hours of calm seclusion and leisure; and in order to find wall enough for the pictures, this may be assumed to be the principal drawing-room. Here, therefore, may be the best specimens of painting, and even of sculpture, if the space permits; here the chimney-piece may be by Flaxman and the doors of the print-case by Stothard. The pictures cannot be very large, on account of their number and the size of the room. This, the objection which in a great measure excludes the grandest works from our dwelling-houses, was met by the Italians, and by Nicolo Poussin, by reducing the grand to domestic conditions. If you have only small pictures, however, you cannot cover the upper part of the walls, for you are not supposed to have any work of art here which can be sacrificed.

Enlightened connoisseurs see excellence both in the Dutch and Italian schools, but they are often embarrassed in arranging them together. I am convinced, however, from instances I have seen, that this is to be accomplished satisfactorily. It is sometimes argued that no one reads Milton and Crabbe alternately; but this is hardly a parallel case. Many go to a gallery to look at a particular picture and see nothing else; the eye is blind when the attention is not actively exerted. So in a room, the spectator selects his favourites—his favourites at least for the time and scarcely looks beyond them. At another moment he will perhaps direct his undivided attention to works which he passed over on a former occasion. A certain congruity is sometimes to be accomplished, by attending to impressions rather than names and schools. Many an Italian picture would not be out of place with the Flemish and Dutch school; while Vandyke, Ruysdael, Cuyt and others might sometimes harmonise in many respects with the genius of the south. The arrangement of pictures comprehends some of the difficulties which the artist experiences in the production of one; for a certain balance and repose are as essential for the eye as an harmonious impression for the mind. Much must, therefore, depend on the nature of the materials; and the (assumed) different character of your two drawing-rooms may here be an advantage.

You, I know, will not ask whether the productions of the English school are admissible in this "Tribune" as well as elsewhere. Such is the variety of English art that the more refined Dutch, the Flemish and the Italian taste may be recognised in it by turns, and no modern pictures harmonise with the scheme of colour and effect which characterise the master-works of former ages so well as the English of the last century. Thus much of schools, and those we have not mentioned may be tried by the same tests.

With regard to subjects, the mind as well as the eye must be respected; the *ethos* of painting is quite compatible with familiar and homely subjects; and, on the other hand, the greatest Italian masters have sometimes sought for poetic impressions in regions where it would be unsafe to follow them. But, with this reservation, you must not be exclusive; various minds, or the same mind in various moods, will like variety of aliment. In other situations which we have had occasion to consider, the subject has been in a great degree calculated on the probable feelings of the spectator; here the subject is independent, because the attention is free, and the whole art appeals by turns to the whole range of thought. The leisure of cultivated human beings should be so far complimented as to assume that all the strivings of the mind are worthy to be ministered to. It is a mistake to suppose that solemn or even terrible themes are always objectionable; I believe it will be found that the grander efforts of invention (I speak of works by the ancient masters) are very generally appreciated by the gentler sex. On the other hand, the fondness for humbler subjects is not always referable to the homeliness of the incident represented. The subject often acquires elevation and commands respect by the evidence of mental labour and power in the artist. To a true connoisseur, this skilful application of principles derived from universal nature supersedes the mere subject; and the idea which he recognises, whatever may be its vehicle, is grand and poetical. Less experienced observers are often deceived by the title of pictures. *A Court Yard* (de Hooghe) sounds unpromising enough; but when it is seen

that the painter has represented daylight with its consequent harmony and that all is subservient to this, his aim must be acknowledged to be dignified. It is to be observed, too, that the influence of this high aim on the part of the artist often extends itself to the treatment of the materials which constitute his ostensible subject. It is easy to see from the unaffected feeling, as well as from the relative character of the execution in some (though not all) of the Dutch masters, that the real subject of their meditation was noble. I should like to see a *catalogue raisonné* on the principle to which I have alluded, distinguishing the title of a picture from the real intention of the artist. Many frequenters of the National Gallery criticise Reynolds's *Three Graces*, whence it appears they are not sufficiently aware that the personages in question are portraits of three fashionable ladies of the day, under the name of the Graces, &c. If some titles could be translated, what a contrast the real import of the work would present to the actual name. What a change, for instance, from the modesty of some of Turner's titles, *Crossing the Brook*, *Coal-barges in the Thames: Night*, to the beauty and grandeur which would require to be approached (for they ought not to be definable) in language.

With respect to the colour of the walls on which pictures are hung, opinions differ much. I am quite aware that it is necessary to consider wall, pictures, gold frames, and all, in relation to general effect; the gold, especially, is to be treated as part of the *coup d'œil*. But, though I remember examples of light walls hung with pictures producing an agreeable effect, I prefer a colour which displays the pictures more, and must also maintain that living pictures are seldom seen to the best advantage against a bright ground; the quantity of actual light (it may always be assumed) making reflected light unnecessary. My idea is, that the wall should not be so light as the lights of the pictures, and this supposes a sufficiently low tint. Of such colours the most agreeable will, I believe, be that which is calculated to give effect to the frames, either by a difference of degree or of kind—either by a deeper, richer gold colour, or by a red inclining to purple; of these, the former would look best by night. I need not recommend you to avoid too much unbroken polish in the frames, since this is now very generally disapproved of.

An Italian Villa in the Sixteenth Century.

I have hitherto, as you see, exercised, apparently without scruple, the dictatorial authority with which you have invested me. As a relief, I intended to have given you some extracts from an Italian ethical work (printed about the middle of the sixteenth century*) in which there is a chapter on the "ornamenti della casa;" but they would have been, perhaps, little suited to your purpose, and I have already far exceeded the space I ought to occupy. As I may not, however, again have an opportunity of alluding to this work, which is not unimportant in the history of Italian art, I wish briefly to advert to one or two points.

The list of pictures given seems to prove that the Italians long remained faithful to the older masters. The names of Titian and Correggio do not appear. (I hope you will not follow the catalogue in such defects.) This is not to be explained by supposing that the writer speaks for himself only; for he repeatedly says, "Some like to ornament their rooms with the works of —, others with those of —," and so on, as if professing to give a variety of tastes. I can only account for this in one way; the author lived in Milan, and it would appear that the style of Leonardo, closely allied as it was to that of the schools of Central Italy, long continued to influence the Milanese amateurs as well as the Milanese painters.

I pass over the musical instruments which, beside their chief use, "*piacciono assai all'occhio*," especially when made by Lorenzo da Pavia or Bastiano da Verona. Donatello, Michel Angelo, Alfonso Lombardi and Cristoforo Romano are the sculptors he enumerates. The terra-cottas are by Paganino da Modena; the bronzes by Verocchio and Polaiuolo. Beside antique medals, he admires those of Giovanni Corona of Venice, together with the chasings of Caradossa. Among the works of the latter, he mentions a silver inkstand in basso rilievo, "*fatica d'anni venti sei, ma certo divina*." Cameos and intaglios should be, he thinks, by the hand of Pietro Maria, Tagliacarne, &c., but above all by Giovanni di Castello.

Now for his list of painters. Filippo Lippi, Mantegna, Giovanni Bellini, Leonardo da Vinci, although, he adds, he left but few works.† Then follow the younger Lippi, and Perugino, and, heralded with appropriate honours, Raphael, accompanied by Giulio Romano. Pietro della Francesca and Melozzo da Forlì are characterised well, as indeed are all the painters. He next mentions some artists, all monks, who wrought in inlaid wood (*commesso, tarsia*), but his highest praises

* Castiglione Saba, *Ricordi ovvero Ammaestramenti*, &c. Milano, 1559.

† The author says he was an eye-witness of the Gascon cross-bowmen making a target of Leonardo's model for the equestrian statue of Francesco Sforza.

in this department are reserved for Fra Damiano da Bergamo, the artist of the choir of St. Domenico at Bologna. The engravings he speaks of are by Albert Dürer and Lucas van Leyden.

Tapestries from Flanders, carpets from Syria, Turkey and Barbary, figured leather from Spain, are all admitted to be desirable ornaments:—"Tutti questi ornamenti ancora comendo perchè arguiscono ingegno, politezza, civiltà e cortegiania." The author next describes his own treasures; but, except a head by Donatello and some rare books, he has nothing to boast of. His tastes are characteristic of the age; though a priest, his ambition is to have a collection of arms and armour, if wrought by a good Italian or German armourer; and, above all, he aspires to the possession of a large steel mirror, of the kind made by Giovanni della Barba, a German; the mirrors of glass then in use were, it appears, commonly small and imperfect. The author's judicious observations (to which I refer you) on the chief use of mirrors may reconcile you to their occasional introduction over chimneypieces, which, for the rest, are by no means the best places for pictures.

The chapter ends with a pleasing story about a mirror and a lady, and Galeazzo Visconti, Duke of Milan; a story copied by Addison (though without acknowledging the source) into the *Spectator*. The incident would not be an unworthy pendant for "Collalto,"* and might have furnished a subject for the graceful pencil of Stothard; but it is time to make an end.

THE EVOLUTION OF ORNAMENT.†

OF late years the tendency of archæological research has been to seek in Egypt and the Assyro-Babylonian area the beginnings of the early civilisations, not only of Greece, but of the bronze age generally in Europe. Indications of a reaction against a too exclusive attribution of Eastern origin are shown by M. Salomon Reinach's recent papers in *L'Anthropologie*, "Le Mirage Oriental."

But the writer presses his views to extremes as great as those he combats. Archæology is essentially a science of patience, and its problems will not yield to controversial methods. In the meantime M. Reinach's essays may stand as a useful protest against a too great haste in accepting suggestions of Eastern origins on insufficient evidence. His main thesis is that the culture represented by the Ægean civilisation is not due to Egypt or Chaldaea, though it may show contact with both, but that it is essentially Western and European. The questions raised by M. Reinach cover a very large field of archæology.

Possibly the most interesting of recent contributions to the general question is Mr. Goodyear's "Grammar of the Lotus," to which work the present paper is largely indebted.

The influence of Egypt on Greek art has long been recognised. But the close dependence of the decorative motives of Greece on those of Egypt had hardly been suspected. The proto-Doric columns of the rock-cut tombs at Beni-Hasan (twelfth dynasty) have been frequently figured. The Ionic form, though conceded to be older than the Doric, has, on the contrary, hitherto been traced to Assyria, with an ill-defined cross-reference to the floral capitals of Egypt. Mr. Goodyear has now established its direct descent from the Egyptian lotus-capitals along lines which had been foreshadowed by writers such as Reber, and with an abundance of illustration has traced step by step the modifications of the form. Further, he has shown that even the rosette, an ornament hitherto regarded as distinctively Assyrian, can be dated in Egypt, not merely as isolated examples, but in decorative use, many centuries before the earliest known example in Assyria. In short, Mr. Goodyear's book establishes the fact that Egypt played a part in the art of the ancient world similar to that of Italy of the Renaissance in the modern.

With the obscure questions of origin which lie at the back of Egyptian civilisation, and the contest for priority in the Mesopotamia region, I am not concerned. Nor is the preceding statement to be taken as implying a concurrent extension of social or political influence, or even conscious copying of Egyptian originals, but merely the extension by contact, direct or indirect, of the decorative motives of Egyptian art. Intercourse implies exchange, and in particular instances the spread of patterns may have taken place in an opposite direction to that of the more important culture and race movements. Mr. Goodyear has properly guarded himself on this point. He remarks:—"It does not weaken our estimate of the influence of Italian Renaissance civilisation upon modern Europe to know that there was not one principality in Italy after 1530, outside of Venice, which was not ruled or controlled by a foreign dynasty."

Some of the details in Mr. Goodyear's argument have

* See Rogers's *Italy*.

† From a paper on "The Origins of Prehistoric Ornament in Ireland," by Mr. George Coffey, A.I.B., M.R.I.A., published in the "Journal of the Royal Society of Antiquaries of Ireland."

been questioned. For instance, as regards the Assyrian palmetto ornament and the ivy-leaf pattern of the Greeks. But points in controversy such as these do not affect the main argument of the book, and may be left for settlement to a fuller discussion of the entire body of evidence bearing upon them, and, I am tempted to add, a more sympathetic examination of so important a work than up to this it has received. It is sufficient to say here that the essential point in the argument is not whether the Assyrians and Greeks knew certain patterns as conventional representations of palm and ivy, or not, but that the decorative types of these patterns were fixed in Egypt many centuries before they appear in other civilisations, and, consequently, that whether the floral form be consciously translated or merely imitated, the pattern is Egyptian in origin. Bearing in mind the Renaissance analogy already mentioned, the importance of a clear understanding of this point will be apparent. It is conceded that any given people might, independently, develop any given pattern. But it is asserted as a fact that, with few exceptions, this has not been the case in ancient Europe. On the contrary, widely-spread patterns, it is contended, can be shown to have had centres of origin, and to have been extended by copies, and copies of copies, modified by local tendencies. Where two forms of ornament, which can be related artistically, are found in use among different peoples, and the ornament can be dated earlier with one people than the other; and, further, where it can be shown that the peoples were in contact commercially or otherwise, it is assumed that the younger people, as regards the particular form of ornament, have borrowed from the elder. For from the fact of the ornament being earlier with the elder people, it is more than probable that it would have reached the younger by intercourse before they could have developed it independently.

Mr. Goodyear's argument is based on the discovery of a principle or law of Egyptian ornament, in accordance with which the various decorative patterns are shown to be conventionalised forms of the lotus. The adverse reception which his work received at the hands of reviewers may be accounted for by the fact that the writers probably had not made a special study of design, and were reluctant to throw over the pre-conceived idea that geometric ornament is the most primitive form of art and earlier than naturalistic representation. The specific objection which may be urged on historical grounds against Mr. Goodyear's theory of Egyptian ornament I shall take up presently. It is desirable that a brief attempt should be made to acquaint the reader with the general bearing of the question of conventionalisation in ornament before we discuss that objection.

But Mr. Goodyear no longer stands alone. While he was working out the problem for Egyptian art, Professor A. C. Haddon had independently reached similar conclusions in regard to the savage art of British New Guinea, and Mr. H. Balfour had arrived at like results in the Pitt-Rivers Museum, Oxford, working on the method of "series" originated by General Pitt-Rivers. Further, it appears that Mr. Percy E. Newberry had, in 1885, worked out the derivation of the Ionic form, including surface patterns, from the curling sepals of the lotus; but, though he had prepared his matter for press, he was unfortunately anticipated by the publication of Mr. Goodyear's papers on the same subject in the "American Journal of Archæology," in 1888.

And, as though the subject was in the air, yet another and another independent worker was in the field. As far back as 1881 Dr. Hjalmar Stolpe, of Stockholm, was developing similar views on the ornamental art of savage peoples; and in 1891 Mr. Charles H. Read published an exposition of ornamental transformation in examples from the south-east Pacific.

In America the principle of conventionalisation of realistic prototypes has been applied by Mr. William H. Holmes to the study of the ancient art of the province of Chiriqui, Columbia. At the conclusion of an important paper, published in 1888, he makes the following generalisation:—"The agencies of modification inherent in the art in its practice are such that any particular animal form extensively employed in decoration is capable of changing into or giving rise to any or all of the highly-conventional decorative devices upon which our leading ornaments, such as the meander, the scroll, the fret, the chevron and the guilloche are based."

It is remarkable that so many investigators, working apart and on different materials, should thus about the same time have reached such closely-related conclusions.

It may be stated parenthetically that the influence of the textile arts in imposing geometric conditions on ornament has probably reacted more or less strongly, according to the relative stages of development of the arts, on the decorative motives of pottery and other arts, and in some instances may have determined the line of descent of the patterns. But the numerous series of patterns conventionalised to geometric forms in examples of free carving and painted decoration, in which the descent appears to be through the principles of copies of copies or of suggestion prompted at each stage in the evolutionary series, preclude generalisation. Mr. Holmes found that

the explanation he had given of ancient Pueblo art, in which he traced the decoration to a "mechanical origin mainly in the art of basketry, and thus accounted for its highly geometric character," could not be applied to the geometric forms of Chiriquian art. He adds:—"In beginning the study of Chiriquian decorative art, I found it impossible to approach the subject advantageously from the geometric side, as was done in the Pueblo study, since life elements so thoroughly permeate every part of it." In each case the evidence must be considered with reference to the local conditions and relative priority and development of the arts.

The theory that ornamentation has been derived from naturalistic representation through a process of conventionalisation, that naturalistic art precedes geometric decoration, was at the time of the publication of "The Grammar of the Lotus" known only to a few students of the subject. The argument of the work was not therefore fully appreciated. Opportunities of frequent discussion of the subject with Professor Haddon, who was at the time working out the problem for savage art, had made me familiar with the theory before the appearance of Mr. Goodyear's book. The latter established its wide, if not general, application.

The principle, as in the case of most principles of extended application, is not so new as it looks. As far back as 1849, Sir John Evans, of whose work on this subject Mr. Goodyear does not appear to have been aware, had applied the same process of reasoning to explain the types of the Gaulish and British coinages.

The types of those coins are chiefly derived from the *stater* of Philip II., modified to some extent by other Greek types, through a series of copies modified by a tendency towards conventionalisation and symmetry. Types which appear to be wholly decorative are shown to be descended from the laurelled head of Apollo on the obverse, and the biga on the reverse of the Philippi. On the obverse we see the wreath of the original type persisting as the most prominent feature of the copies; the ear survives in the crescents, and finally all tradition of the original type is lost, and a symmetrical arrangement of the wreath feature adopted, with crescents or ears, back to back at the centre. On the reverse the recollection of the second horse is at first preserved in the duplication of the horses' legs, then the horse is further simplified, the legs disconnected from the body, and the prominence of the joints accentuated as pellets. The wheel of the chariot is set free, and may occupy any portion of the field. Finally the horse is completely disjointed, the legs surviving in dumbbell-like objects, and the round prominences of the joints give rise to an ornament of pellets in the field of the coin. Upon the general subject of the designs, Sir J. Evans writes:—

Among barbarous nations the laws which regulate the types of a coinage of this kind, consisting of successive copies of copies of a given original, are much the same as those which, according to our best naturalists, govern the succession of types in the organic kingdoms. As with plants or animals of any group or family, there are two tendencies to be traced in these successive copies—the one to retain the character of their ancestors, the other to vary from it. The main principle is, no doubt, that of "atavism," or taking the character of the parent; but another principle of more importance, as far as results are concerned—that of the perpetuation of varieties when they were in any way advantageous—is equally at work in both cases. In nature those varieties appear to have become more or less persistent which, in the "struggle for existence," have presented advantages over the present form in their relation to external conditions. But in the succession of types of these British coins, the requirements which new types had to fulfil in order to become to a certain extent persistent were, firstly, to present facility of imitation, and, secondly, symmetry of form. The natural instincts of uncivilised man seem to lead to the adoption of simple yet symmetrical forms of ornament, while in all stages of culture the saving of trouble is an object of universal desire. The reduction of a complicated and artistic design into a symmetrical figure of easy execution was the object of each successive engraver of the dies of these coins, though probably they were themselves unaware of any undue saving of trouble on their part, or the results which ensued from it.

Briefly summarised, the argument of "The Grammar of the Lotus" may be stated thus. Working on similar lines to Evans Mr. Goodyear derives the leading decorative motives of the Egyptian patterns from certain spiral and other modifications of lotus ornament. He then traces the influence of Egyptian patterns in the decoration of the earlier civilisations of the Mediterranean, and finally extends that influence to the pre-historic art of Europe generally. With regard to the latter portion of the subject the argument is rather suggested than developed in detail, and examples of western geometric ornament, with which we are immediately concerned, are not considered.

To return now to the historical objection. The weak point in the construction of Mr. Goodyear's theory is this. The development of Egyptian patterns does not appear to be proved historically. It is the fashion to decry "The Grammar of the Lotus," and adverse criticism can press this objection with apparent effect. The impression is left on the reader's mind

that examples are selected from widely separated periods and then arranged in series irrespective of date, and the development and modification of the patterns argued from the artistic relations of the series, regardless of historical sequence. Thus the spiral is fully developed and worked with great beauty of treatment on the scarabs of the twelfth dynasty, but the weight of evidence of the interdependent association of spiral and lotus, to which the origin and development of the spiral and spiral patterns appear to be traced, lies in the eighteenth to the nineteenth dynasties. I am not sure that on a strict reading of the text Mr. Goodyear has left himself open to the above objection. As regards the twelfth dynasty spirals, he has adduced examples from the scarabs of associated lotus, and referring to a developed spiral pattern from Beni-Hasan, unfortunately destroyed, he fairly observes that the demonstration from a later pattern, which he relies on to prove lotus details, "reacts on the original Egyptian forms, whose history is now obscure and whose earliest evolution is unknown." It may be further urged that the existence of even a single example of developed spiral pattern of the ceiling order in the twelfth dynasty implies a whole series of patterns in that dynasty now destroyed or still to be recovered. But the spiral is carried back by the scarabs to the fifth dynasty, and it may be contended that its derivation from the lotus is not proved.

A point in favour of Mr. Goodyear's view is the representative character which he claims for the spiral as a symbol for the lotus. Evidence is accumulating as to the religious and magic use of ornament by savage peoples, which may ultimately have an important bearing on the development and use of ornament, but the subject is at present too obscure and would take us too far to discuss here. In any case the representative character of the spiral if established would be equally well explained as the survival of an incorporated spiral motive. Looking at the series of scarabs of the fifth to the twelfth dynasties, published by Professor Flinders Petrie in "Historical Scarabs," on many of which spiral patterns are found, but not incorporated with the lotus till the twelfth dynasty, it is apparent that the weight of evidence of the scarabs is against the lotus origin of the spiral. The preceding remarks apply equally to the lozenge patterns. This may well seem a fatal objection to the theory of the descent of Egyptian geometric ornament and derived patterns from conventionalised lotus forms.

But a wider view of the subject will enable us to see that this need not be so. The origin of geometric patterns through the conventionalisation of naturalistic prototypes is a larger subject than Egyptian ornament, of which the latter is but a particular case. Evidence has now been collected over a large area of savage art, which leads us to believe that geometric patterns, with perhaps the exception of some zigzag, chevron and triangle ornaments, the history of which cannot always be traced, have been invariably derived from naturalistic forms. In many instances the whole series of the transformation is found on a single object. In such cases the series has probably been determined by the limitations of position of the several parts. Dr. Stolpe writes in reference to Polynesian ornament:—"Nor were the transformations due to any want of skill on the part of the Herveyan carver, because he often used to place on the very same implements the realistic prototype, as well as the whole series of intermediate forms, down to those that are most transfigured; and this fact furnishes proof that the artificer must have been thoroughly conscious of the meaning of even the most 'degraded' design." And dissenting from Mr. Read's view that "the artist would unconsciously lean towards a kind of generalisation of details which, by saving his time, would enable him to produce more, and naturally at a cheaper rate," he adds:—"No doubt there were other reasons for conventionalising, and one of the most substantial, I think, was that the higher standing types were not suitable decorations for every part of the objects adorned. On the 'paddles' we therefore see them almost exclusively confined to the flat rectangular terminals of the shaft. If this space did not allow more than one row of complete figures, what remained was filled up with rudiments of them. On the shaft the space was usually still more scanty, and on the blades the very shape of them made the most conventionalised stages to be the fittest adornment."

Evidence of historical sequence is not forthcoming for savage art, except in so far as new forms have been introduced by foreign civilisation. Dr. Stolpe asserts "no chronological signification exists at all in the history of these developments. On the material known to us, phases the most remote from each other in order of development occur even on one and the same implement. To distinguish between earlier and later objects, one has no other guide than an appeal to the workmanship which here, as elsewhere in the world, deteriorates in proportion as foreign civilisation gains ground."

But in the examples of Polynesian ornament discussed by Dr. Stolpe, we find not only that the complete series of transformations is represented on one and the same object, but that somewhat of a religious significance is attached to the ornament; and the classes of objects decorated with conven-

tionalised ornament, even when the realistic prototypes are absent, furnish a convincing line of evidence as to the descent of the patterns.

Moreover, Professor Haddon found that in British New Guinea, among neighbouring peoples, the tendency to conventionalise had, in some instances, followed different paths, probably due to some selection of feature of the realistic prototype, or some idiosyncrasy or preference of fashion in the particular tribe—in one case leading to curved lines, concentric circles and spirals, in another to straight lines and angular ornament. Here, again, the argument based on the existence of several distinct lines of descent of patterns, not merely distinct at certain stages, but separable along the whole line of each series, and the specialised use of the patterns, is very convincing as to the origin from realistic prototypes of the geometric ornament of British New Guinea.

But if we put aside prepossessions acquired from the study of the higher developments of art, the fact that realistic representation is prior to geometric ornament should not surprise us. If we watch a child drawing, we find that geometric form, or ornament of any kind, is not present to the child's mind. On the contrary, its pleasure is centred in realistic representations of objects which have aroused its interest—animals, boats, trains, &c. And so with primitive man, he draws in the earlier stages realistic representations of the things that interest him. It is worthy of note that representations of the sun and moon are rare in primitive art; the subjects depicted are taken, for the most part, from the life immediately in contact with man, in which his daily needs are centred. Pictorial representation in this stage can, indeed, hardly be called art; its end is visualised realism.

Ornament represents a higher stage in intellectual development; it means adaptation, arrangement and relation of lines, symmetry and co-ordination of parts. In fact, geometric patterns represent a very considerable intellectual advance as compared with merely imitative drawing. A higher stage is entered on when naturalistic representation is developed under the conditioning limitations of art—when, in short, the subject is "treated" and not merely imitated.

The bearing of this lengthened digression on the chronological difficulty in Egyptian art is this. It does not appear to me to be proved that the spiral has been derived from the lotus. But Egyptian art, as we know it, has no beginnings. It is reasonable to assume that the geometric stages were passed through in a period preceding Egyptian ornament, which is at present a blank to us: that the civilisation from which that of Egypt must have at some time emerged was already in possession of the spiral and other geometric forms. But conventionalisation in ornament is a principle which has continuously operated in all stages of art, and the prior existence of geometric forms would serve as the cutting of the channel, or an attraction towards which Egyptian ornament would conventionalise. A passage in Dr. Stolpe's essay explains my meaning:—"An ornament may have more than one source. It often happens that when a series of developments approaches a certain well-known geometric motive, it quite simply incorporates the latter by reason of this relation. After such an incorporation has taken place, it will be difficult enough to decide to which of the two divisions an ornament properly belongs." Thus though the spiral may be found in the earliest examples of Egyptian ornament, still the series of transformations through which the lotus is shown to be conventionalised to spiral forms, and finally to be replaced by spiral patterns, is a true series. The fact that the spiral cannot be proved to have necessarily originated in the curling over of the sepals of the lotus, does not impair the evidence of the series of the "Ionic" forms through which derivation of the Ionic spiral capitals is traced to the conventionalised lotus.

As regards the secondary portion of Mr. Goodyear's work, in which he is dealing not with cases of direct descent, but of copies, and copies of copies of Egyptian originals, the argument of conventionalisation is absolutely untouched by the historical objection, and rests on the positive evidence of each particular series, in accordance with the principles laid down by Sir John Evans for the types of the Gaulish and British coinages, to be accepted or not in proportion as the steps in the transformations can be satisfactorily made out, and the lines of intercourse along which the patterns have travelled established.

THE SOANE MUSEUM.

THE *Globe* has the following chat between the new curator and a correspondent:—

"I don't intend to vegetate here," remarked Mr. G. H. Birch, F.S.A., the well-known architect. He was seated in that quaintly arranged and comfortably furnished room which the late Sir John Soane used as a breakfast-room, and in which some of his choicest relics are stored. There was the ruddy glow of health upon his cheek, for Mr. Birch is in the prime of life, and his remark was in reply to a suggestion of strangeness

that he should settle down so early in life to a quiet old age as a curator even of so curious and fascinating a collection as that in Lincoln's Inn Fields. A curatorship of this class is generally regarded as a sort of pension, but Mr. Birch declared that he declined to accept it in any such spirit. "I am going to make it of interest to every one," and he proceeded to show how he should do so.

First, it must be remarked how few people know much of the Soane Museum. To the majority it is a strangely built house, overcrowded with curios of the description usually found in private collections. To the few it is known to be full of special features that can be found nowhere else, a collection worthy of the closest study. But it is improbable that any living person knows thoroughly what the place contains. Though its former curators have been men of culture, and of much enthusiasm with regard to the relics placed under their charge, it is doubtful whether even they have ever made themselves thoroughly acquainted with the contents of the place. And this, not because of any want of diligence on their part. The fact is that Sir John Soane had a sort of mania for two things. One was the use of looking-glass in every possible corner and in the most unexpected places, and the second was for making cupboards, folding doors for pictures, and hiding-places on a sort of secret panel arrangement of his own. The former gives the place a weird aspect. "It is a good thing I am not a nervous man," Mr. Birch said; "but I must confess when I came here I was often startled by seeing my own reflection—which in the dusk I did not recognise—advancing towards me from out of odd nooks and crevices. At times the effect was ghostly, but I am getting used to it." By the second feature of the place, Sir John Soane made the house hold three or four times its apparent capacity, and things are so crowded together that constant discoveries are being made of articles of the greatest possible interest. There are few men, if any at all, possessing such a knowledge of everything valuable that they would be capable of appreciating the worth of all the treasures. To do so a man would have to be a bibliophile, an art connoisseur, an architect, a draughtsman, an Egyptologist and an archaeologist, not to mention other less important qualifications, for such a wide range of curiosities and specimens—covering as it does every art and almost every science—has probably never before been collected under one roof. That is why many valuable things are hidden away unappreciated.

There are many secret places that have rarely been opened, many nests of drawers of which the keys have been lost, cupboards that may simply have skeletons in them. To open these hidden stores of wealth, to make fresh discoveries, and to make them available to the public is one of Mr. Birch's ideas. He has not been there long, but he has already made one discovery on which he prides himself. Taking a small key from his pocket, he crossed over to the other side of the fire-place, to where the wall was panelled with wood. There seemed no hiding-place there, and no room for one, but, inserting the key in a concealed keyhole, he opened a narrow doorway, through which he could just pass. Beyond was a "strong room," and from this he returned with a paper-covered book, that looked as though it might have been a copy-book of a child of Brobdingnag. It was, however, a book in which were designs of buildings erected by Vanbrugh, an original account-book of Blenheim Palace, and original drawings by Thorpe, an architect of the reign of James I.—a perfect mine of interest to architects. With reverential care Mr. Birch displayed its contents, and then gathered up his treasure and carried it carefully back to its hiding-place. Other panels he opened in this room, other unsuspected bookcases he revealed, full of old books, many of which doubtless are of considerable value, but which the casual visitor does not deign to notice.

And in respect to cupboards, it must not be forgotten that in his will Sir John specified two, which were found carefully locked, one of which was not to be opened until fifty years after his death, and the other of which was to remain closed for seventy-five years. As Sir John died in 1837, the first cupboard has been opened. The result, Mr. Birch remarked, has never been made public; but as a matter of fact, the cupboard was found nearly empty. The most interesting thing found was a letter to Turner enclosing a cheque for 500*l.* which had never been posted. The letter—and it possesses interest from the fact that it has never before been published, was as follows:—"Dear Turner,—I saw that drawing last night and admired it very much. And if you think the accompanying cheque in any way represents the value of it, pray let me have the picture.—Yours, &c., John Soane." Whether the other cupboard will reveal anything of greater value remains to be seen.

A walk round the museum showed that Mr. Birch was wonderfully well informed as to its contents, as well as well versed in its intricate geography. In the dining-room and library he pointed to the capacious and crowded bookshelves on the walls, in the projecting piers dividing the rooms, and in the window recesses, where one usually finds shutters, and announced his determination of exploring these shelves

and examining each book—a truly Herculean task, which will certainly tax his patience and perseverance. This is perhaps one of the best known parts of the museum, and there is no necessity to linger over the pictures which cover the vermilion-painted walls, the curios with which it is filled, and the strange furniture crumbling to pieces with old age. In every other part of the museum he indicated cabinets and places to be explored, while in the oddest possible spots he showed how the space had been made the most of. Nowhere, of course, is this more noticeable than in the picture-room, which has the unique series of movable planes, shown to every visitor, which makes a room 13 feet by 12 feet equal in picture-hanging space to a gallery 45 feet long by 20 feet broad. But this is by no means the only instance, and visitors who have the time and inclination may find many others.

The pictures by Hogarth, *The Election* and *The Rake's Progress*, everyone knows; and it is noticeable how much better preserved these are here than those in the National Gallery. The Canalettos also are to everyone's taste, but there is one particular feature of the art portion of the museum which no doubt strikes some visitors. It is that one sees here pictures by artists long since dead and forgotten and whose works are never seen elsewhere. It is evident that Sir John was an art critic of the broadest possible views, and that, added to the catholicity of his taste, was a desire to perpetuate the worth of many neglected men. Who now remembers George Jones, Danby, Owen, Jackson, Howard or Bird? Yet here are pictures by each and all of them, which anyone who has patience to find them out will view with admiration. The ordinary visitor when he has gazed at the Turners, the Lawrences, the Ruysdaels, Raphaels, Reynolds, Rubens, Tintoretto, the Zuccharellis and the Watteaus, has little disposition to linger over the mass of paintings and drawings of peculiarly architectural merit, and gives but a passing glance of astonishment at the numerous designs of buildings which Sir John Soane proposed to build in various parts of London. One of these, his great design for a royal palace in the Green Park, might have been utilised had George IV. lived; but after his death more economical notions prevailed. Buckingham Palace became a Royal residence, and was subsequently enlarged by the Prince Consort. There is something pathetic in these long rows of grand edifices which Sir John found time to draw—the Royal palaces, the design for a new House of Lords, the new Houses of Parliament and Courts of Judicature, a triumphal bridge and churches innumerable, which never got further than a paper existence, and which are now but a monument to the untiring industry of the man.

Walking through the corridors, the students' rooms, the monk's parlour, the catacombs, the sepulchral chamber and the crypt, Mr. Birch showed that he is full of schemes for popularising the museum and making it of greater use. At present the prominent features of the place only are known, and those not so widely as they should be. What is wanted is that some knowledge of its hidden treasures should be spread abroad. The museum is now more readily accessible to the public than it used to be. Formerly it was only opened on two days in the week. Now, from March to August inclusive, it is open to the public four days in the week, the other days being reserved for students, of whom there is an increasing number.

SHEFFIELD SOCIETY OF ARCHITECTS.

THE ordinary meeting of members was held at the School of Art, the president, Mr. E. M. Gibbs, in the chair. Mr. Henry Longden, of London, gave a lecture on "The Working of Wrought-iron from a Practical Point of View," which was illustrated by specimens both of finished work, and of forged ironwork in process of manufacture. He first dealt with the qualities of wrought-iron, as, for example, its strength, lightness and comparative cheapness. The process of forming the parts of iron railings and gates, and of forming scrolls, twists and leaves, hammered work of iron, were then dwelt upon. Some old examples of the use of iron railings were referred to, and suggestions were made as to the best effect to be got in the designing of railings. The lecturer showed some examples of carving in wrought-iron, a difficult art, and one which, he said, should only be employed sparingly. Specimens studied from old Venetian work and of modern work now in process of execution were shown. The works of Mr. Sedding, the architect, were referred to, and it was named that some of his work, executed in Sheffield, may be seen in St. Matthew's Church in this city. Some general remarks as to the present larger use of wrought-iron work were made, and it was urged on the meeting that only work of a fine, workmanlike and characteristic order of design and execution should be used. A cordial vote of thanks was passed to the lecturer, on the motion of Mr. Hadfield, seconded by Mr. Smith, supported by Mr. Hoyles, Mr. Winder, Mr. Fenton and Mr. Gibbs.

GLASGOW ARCHITECTURAL ASSOCIATION.

THE general monthly meeting was held in the Rooms, 114 West Campbell Street, the president, Mr. A. N. Paterson, in the chair, when Mr. Wm. J. Blaine read a paper on the "History of Monumental Buildings." Dealing with the origin of these buildings in the pyramids of Egypt, he traced the development of the square tomb through Assyria to Greece, and described the sepulchre of Mausolus at Halicarnassus. He followed the round tomb from the tumuli of Asia Minor through Etruria to Rome, and showed cause for the decay of this form in the introduction of Christianity in the seventh century, which discouraged the idea of the secular tomb. During Mediæval times the tomb was part of and was absorbed in the cathedral, and it was not till after the Reformation that, owing to the revival of interest in Classic art, this class of building came again into favour. After acknowledging the pre-eminence of French architects in the design of national trophies, the lecturer proceeded to describe the national monuments of Germany, pointing out the lessons that were to be derived from that country in the patriotic grandeur of their public monuments. The folly of crowding our churches with incongruous statuary was out of all taste, and Mr. Blaine advocated the erection of both national and municipal monumental buildings for the reception of the statues of our great men. Our larger cities could well afford to acquaint their citizens in this way with a sense of their own greatness and of the devotion, courage and intelligence which had gone to build up their name.

BONDAGE OF CHARTERS.

AT a time when the Royal Scottish Academy and the Society of Scottish Artists are disputing before the Privy Council the clauses of a supplementary charter promoted by the former body, it is hardly judicious, writes a correspondent of the *Glasgow Herald*, to express an opinion either on one side or another; but it may be considered an opportune moment to recapitulate briefly the history of the charters of the Academy. In 1838 the Academy became a chartered body, and the charter, like any other new suit, fitted it for a long period; but a time came, as it invariably does, when, owing to the growth of art and corresponding increase of artists, the Academicians made the discovery that the charter required to be altered. Complaints were rife about the exclusiveness of the members of the Academy in regard to their exhibitions, and to meet the views of the younger artists the Society of Scottish Artists was formed. This had the effect of making the Academy move a little faster, and at last, in 1891, the new charter, the outcome of much discussion within and without the Academy, became law. One of the clauses of this new authority provided for transforming the associateship of the R.S.A., which up till this time had been limited, into an unlimited order. At the first election under the new charter a large number of associates were elected, and in the following year the same thing occurred. This, although the result of their own vote, offended some of the Academicians, and the president, Sir George Reid, resigned his position. *Pourparlers* followed between the Council and Sir George, and eventually the head of the Academy agreed, on certain alterations being made on the charter, to withdraw his resignation. These conditions were debated and modified, and ultimately took shape in the supplementary charter which is now before the Privy Council.

Such in brief is the history of the charters of the Academy, and the moral to be drawn is the obvious one, that it is better for an art society to have a simple constitution and rules than to be governed by the more rigid system of charter law. The difference between the two is—with a charter, alterations can only be made by applying to the Privy Council, a method entailing great expense and the usual red-tape waste of time; without it the members themselves have the power to alter their rules quickly and without cost to suit the times they live in. The troubles that afflict and have afflicted the Royal Scottish Academy are undoubtedly caused by its being a chartered body. Had there been no charter it is evident that rules could have been altered to suit circumstances, and as one result there would not have been any Society of Scottish Artists at the present day. It took several years to prepare and obtain sanction for the charter of 1891. Probably it was intended to last as long as the first one, but no sooner was it in working order than it required to be altered. Doubtless the same thing will occur again and again. In this matter of charters the Royal Scottish Academy has followed in the footsteps of the premier body, the Royal Academy of Arts, the laws and regulations being almost identical. The "bondage of charters" has not been felt so much in the ranks of the older Society, its strength and position enabling it to stand repeated assaults with immunity, but if the Royal Academy has not required to alter its charter, the members have either acquired a contempt for it or have gained courage to ignore it. One of the clauses of the charter of the Royal

Academy expressly forbids its members from being connected with any other Society of artists "established in London," and yet, as everyone is aware, Sir John Gilbert, Alma-Tadema, Professor Herkomer and many other R.A.'s belong to art societies whose headquarters are in the great Metropolis. Two well-known art associations, the Royal Society of Painters in Water-Colours and the Royal Institute, have shown wisdom in refusing to have charters. They are contented with a constitution and rules, and thus each enjoys the prestige and privileges of a Royal Society without any of the drawbacks that a charter entails. In Scotland the Royal Scottish Society of Painters in Water-Colours furnishes another example. Last year it was found that some of its rules were getting rather antiquated. These were no sooner discovered than they were remedied. With very little expense and with no long delay the change was made. It is evident that when charter and constitution are placed against one another the latter has everything in its favour. Simplicity and freedom are its characteristics. For the charter it can only be said that it prevents any other society taking the same name as the one in possession. There are, of course, charters and charters, but so far as art societies are concerned a charter is like an iron shackle, difficult to remove; whereas a constitution may be compared to a leathern thong, which can be unbuckled or tightened at will.

THE TOWER BRIDGE.

THE Bridge House Estates Committee of the Corporation have presented a report on an application by Mr. J. Wolfe Barry, C.B., for some additional remuneration in connection with his services as engineer of the Tower Bridge, the original estimated cost of the bridge having been considerably exceeded by reason of extra works, necessitating a longer period of time in its construction beyond that first contemplated, and consequently throwing upon Mr. Barry much additional expense for assistant engineers, superintendents, clerks of the works and others. The amount which Mr. Barry considered he was strictly entitled to for extra service and money out of pocket was 16,650*l.*; but, after friendly negotiations, the committee recommended the Court to pay him 12,000*l.* in full satisfaction of all claims. Mr. Barry had also consented to act as consulting engineer in respect of the bridge for three years without any payment. The whole of the works had been most successfully carried out, and the bridge itself was not only a masterpiece of engineering skill and the largest ever erected on the bascule principle, but was also an ornament to the Port of London, and the greatest credit was due to Sir H. Jones and Mr. Barry for the design of the bridge, and to the latter for the way in which it had been carried out. From the opening of the bridge till now no hitch had occurred in the raising or lowering of the enormous leaves (weighing 1,000 tons each), and so easily had the machinery worked that no block had occurred in the traffic. The traffic on London Bridge had been satisfactorily relieved, and the bridge was a benefit to the whole Metropolis.

YORK ARCHITECTURAL SOCIETY.

MR. H. PERKIN, F.R.I.B.A., presided on Saturday evening at the annual dinner of this Society, and Mr. G. B. Bulmer, F.R.I.B.A., of Leeds, responded for the Society of which he is a fellow and kindred societies. In his address the President remarked that as to the repairs that were constantly needed to the exterior of the Minster, it would appear from the decay into which it was falling that the funds were quite inadequate for efficient renovation. He asked if it was not competent for that Society to make a representation to the Dean and Chapter, suggesting that they should make a supreme effort to obtain the necessary sums required for the next twenty years or so. If a further appeal were made, some large-hearted Churchman would respond with substantial help, as in the recent case of Peterborough Cathedral. Mr. Perkin was re-elected president.

SCHOOL BUILDINGS.

Slaithwaite and Lingards U.D. School Board.—The first new Board school erected by this Board was opened on Monday morning last, January 7. The school is situate at Wilber Lee, about one mile from Slaithwaite. It contains one large main room, two classrooms, infants' room, separate cloak-rooms, lavatories and entrances for boys and girls, and provides accommodation for 178 children. The rooms are fitted up with dual desks. Adjoining the school the Board has built a residence for the schoolmaster. The building is built of local stone and the roof is covered with green Westmorland slates. The internal woodwork is of pitch pine varnished. The total cost, including furniture, will be 2,300*l.* Mr. J. Berry, of

9 Queen Street, Huddersfield, has been the architect. At the monthly meeting of the Board, held on Thursday last, Mr. Berry was instructed to prepare plans for a second mixed school proposed to be built at Nields, Slaithwaite, to accommodate 300 scholars.



The Adornment of St. Paul's.

SIR,—Perhaps you will allow me to make one or two remarks on the "Note" which appeared in last week's issue of *The Architect*.

I may say that no jealous feeling prompted my criticism of what has been done, and if I can stir up some enthusiasm amongst artists and architects for the glorious work which we are discussing, if the lamentable apathy which seems to hang over every national work can be thrown aside, some public good and some help to the funds must result.

You will, I know, allow me to explain that the words you quote, "there has been a most unfortunate waste of money, and, as regards the progress of English art, the result is degrading," did not apply particularly to the work done by Mr. Richmond, but to the expenditure during the last quarter of a century of the 56,000*l.*

I have no desire whatever to exclude "ecclesiastical" designs—indeed, my reference to St. Annunziata at Genoa shows this—and I should be the first to support your view that we should have "sermons in stones"; but sermons in stones or in words are of very little use, however eloquent, however beautiful, unless the eyes or the ears are able to distinguish what is done or said. That is the burden of my song, and I shall hope fervently to shortly be able to see Mr. Richmond's work, or some other artist's work, which is thoroughly fervid and religious in feeling, beautiful in design and execution, and "to be understood of the people."—Yours obediently.

WM. WOODWARD.

13 Southampton Street, Strand: Jan. 8, 1894.

GENERAL.

Mr. J. Holden, architect, Manchester, will give an address on "Ancient Lights" at the next meeting of the Sheffield Society of Architects.

Sir Leader Williams, the chief engineer of the Manchester Ship Canal, is about to relinquish that position, as the canal is now complete. He will be appointed consulting engineer.

Plans for a new Roman Catholic church for Morecambe, prepared by Messrs. Pugin & Pugin, architects, have been approved by the Morecambe Urban Council.

Mr. Hubert Hall, F.S.A., has been appointed honorary secretary of the Royal Historical Society, in succession to the late Mr. Patrick Edward Dove.

The Liverpool Architectural Society will hold an open-meeting on Monday, the 14th inst., when members are invited to introduce subjects for short discussion.

Mr. Thomas Hunter, W.S., of the firm Macandrew, Wright & Murray, W.S., has been elected town clerk of Edinburgh.

The Annual Conversazione in connection with the Birmingham and Midland Institute will be held next week.

The Queen has consented to be the patron of a bazaar, to be held at St. Martin's Town Hall in May next, for the building fund of the Royal Westminster Ophthalmic Hospital, and the Princess Henry of Battenberg has promised to open it on May 14.

The Annual General Meeting of the Royal Meteorological Society will be held, by permission of the Council of the Institution of Civil Engineers, at 25 Great George Street, Westminster, on Wednesday, the 16th inst., when the report of the Council will be read and the election of officers and Council for the ensuing year will take place.

Mr. Henry Nash, head of the firm of Henry Nash & Co., metal merchants, Liverpool, was found dead in his chair on Tuesday afternoon at his office. He had come to business in apparently good health.

Mr. P. Drew, architect, was on Tuesday re-elected president of the Royal Society of Antiquaries of Ireland, for a term of three years.

The Exhibition of Drawings by Sir E. Burne-Jones at the Whitworth Institute, Manchester, was closed on Saturday. About 40,000 people had visited the gallery.

The Architect.

THE WEEK.

THE employment of amateur architects is not an economical proceeding. To that well-known yet neglected truism Mr. JOHNSTONE, of Lochwinnoch, can sadly testify. He resolved to erect a cabinet factory, and decided to dispense with an architect and a building inspector. His traveller, with that presumption which is the most prominent and enduring characteristic of "bagmen" from time immemorial, prepared the plans. The factory would probably have remained as a monument of commercial enterprise if it could have been preserved under a glass case, for any structure of the kind would have been stronger than the building. But the gale of December 22 quickly brought the factory to an end. Four men were killed and fourteen injured. It was necessary, therefore, to hold an inquiry. One of the witnesses was Mr. T. G. ABERCROMBIE, architect, Paisley, who had made an official inspection of the building. He said the walls were carried too high for safety, and sooner or later the vibration would have caused a disaster. The glass used was too slight, and the iron ties were not strong enough. It was recommended that what remained of the factory should be removed; but under the circumstances they must be foolhardy men who will undertake that work unless costly precautions are carried out. It is said the loss amounts to 4,000*l.*, but of course the amount which will have to be paid for compensation will amount to a much larger sum.

THE Tribunal of Appeal provided for in the London Building Act is now formed. It was enacted that one member should be appointed by a Secretary of State, one by the Council of the Institute of Architects, and one by the Council of the Surveyors' Institution. The nominees respectively are Mr. D. CUBITT NICHOLS, Mr. ARTHUR CATES and Mr. T. CHATFIELD CLARKE. They are appointed for a term of five years, and are eligible for reappointment. The remuneration is to be either by way of annual salary or fees, or partly in one way and partly in the other, as a Secretary of State may fix. The appointments will not excite surprise, and they were anticipated by many architects. The three gentlemen have had ample experience in London, and it is not likely that any of them will give occasion for the enforcement of the clause which makes it lawful for the Lord Chancellor to remove any member of the Tribunal for inability or misbehaviour.

IT is proposed to erect a Swiss village of a comprehensive character in connection with the exhibition of next year which is to be held in Geneva. The outlay will at least amount to 12,000*l.* There will be twenty-two cottages, corresponding with the several cantons, and each of them will represent the most picturesque local type. The interest of the buildings will be unquestionable. In each cottage some local industry will be carried on, such as carving, clock-making, weaving, embroidery, &c., and the occupations of the people in their homes will become more evident from visits to the exhibition than from any descriptions, or treatises on political economy, or books on Switzerland.

IN the speech which was delivered by the secretary of the Education Department on Friday last, one of the causes of defective teaching in this country was pointed out. Addressing the principals and lecturers of the training college, Sir GEORGE KEKEWICH said that, while the buildings of some training colleges were suitable, there were others which were years behind the times. There were buildings that were meant to serve the comparatively humble purposes and aims of educationists in days long past, and which, without alteration, were being used to provide teachers for a system of education that was based on advanced principles. There was a marked contrast between some of these buildings and the modern elementary schools, and that contrast was so much to the disadvantage of the former that it could not fail to attract public notice and criticism. To put these colleges on a perfect footing would require a

considerable sum of money and a large degree of energy, but public opinion was strong as to the necessity of maintaining in all respects the efficiency of our training colleges in a manner fully suited to the requirements of the time. Sir GEORGE KEKEWICH might have added that education in schools nowadays corresponds more or less with the character of the building. The architect, as it were, forms the grooves which masters and pupils have to follow. Ill-arranged, dark and uncomfortable classrooms produce ill effects on teachers in training, and when they enter on their duties in schools they are incompetent to take advantage of the facilities which are provided for their use. In ancient days when scholasticism was supreme a teacher could set up his school under a tree in a forest, but education is now more than an exercise of memory and word-splitting: it has to do with method, which cannot be better exemplified than by the skilful planning of a building.

THE first annual meeting of the Manchester and Salford Building Trades' Association was held on Wednesday. The report stated that notification of the formation of the Association was sent to the Manchester Society of Architects, with a request that in future any communications to any of the trades represented in the Association should be addressed to it, and not to individual societies. A correspondence has already taken place between the Association and the Society of Architects on the subject of deposit of priced quantities, but no decision has yet been arrived at. Notices of a proposed alteration of working rules have been received from several of the operatives' associations, and will be dealt with in due course. The Association has very important functions to perform, and may be of great advantage to the trade in the future.

AT the dinner which was given to M. PUVIS DE CHAVANNES this week in Paris, to celebrate his attainment of his seventieth year, he described his theory of decoration in a few words. He said he was dissatisfied with the grandiose but heavy decorations which were to be seen at Versailles and in other public buildings, and he resolved to adopt the opposite extreme. Instead of painting pictures that would appear to overweight the walls, he endeavoured to make the walls appear more prominent. His figures professed to be no more than simply decorative. We have more than once explained the artist's theory at length, and have published illustrations from the more successful of his paintings. M. PUVIS DE CHAVANNES holds an unique position among decorators, but it is a remarkable fact that, in spite of the size and originality of his works, he has not obtained a tithe of the rewards which men of inferior powers have secured. He has gained, however, the esteem of all artists from his fidelity to his convictions. For eight years' labour and materials he obtained from the State a sum of about 2,000*l.*, and his average income probably does not exceed 400*l.* a year. It is no wonder M. PUVIS DE CHAVANNES possessed only a modest studio that contrasts strangely with those of younger and more fashionable painters. He is not, however, the only great artist in Paris who is not one of Fortune's favourites.

THE condition of that beautiful church, the Trinité, in Paris, is again exciting apprehension. From time to time fragments of the masonry are loosened, and, as there is a public garden in front of the church, which is generally occupied, the fall of a stone near one of the benches or walks would be likely to cause an accident. M. BALLU'S building is hardly thirty years old, and the scaling of the stone does not necessarily mean the instability of the church. It is curious, however, that the sculpture of the exterior is also succumbing. The public can more easily see the effect of the weather on figures than on masonry, and it is excusable if they conclude that the building is tottering because an arm or a part of a robe has disappeared. The congregation is wealthy, and it would not cost much to bring the front of the building into a condition that would allay all fears about its safety; but the Municipal Council have charge of the conservation of the building, and do not appear disposed to lay out money on it, or to allow private individuals that privilege.

THE OLD MASTERS EXHIBITION.

SEVERAL years have gone by since the Academicians were as lucky in negotiating for paintings of equal merit with those which can now be seen in Burlington House. They are, it is true, brought together without any regard for principle or system, and as usual the exhibition fails from the want of a dominant idea. But that objection would be no less applicable to the summer exhibition, which does not exemplify the varieties of modern English art. We feel, in looking at the walls, that accident rather than design has determined the character of the collection. But the pictures are interesting, and students and the public will be wise to study them while they have the opportunity.

The first room is mainly occupied with the works of Englishmen, but Scotland is represented by JOHN PHILLIP and RAE BURN, and Ireland by Sir M. A. SHEE. If we follow the order of the catalogue, PHILLIP comes first with his *Selling Relics, Cathedral Porch, Seville*. As it is incomplete, it is hardly a subject for criticism. The painter was deficient in imagination, and he was not strong in composition. He was compelled to depict everyday scenes. In this case, as in many others, he selected an incident which, from its lack of interest, would not be suited for a drawing in an illustrated journal. REYNOLDS'S *Tribute Money* is a small canvas, and almost a monochrome. It aims at an almost Rembrandtish effect. There are several portraits by the first of the Presidents in the room. *Sir William Fawcett* is one of the Lord HEATHFIELD type of soldiers. The contrast between the scarlet coat and broad crimson sash must be less effective than formerly. The *Marquis of Granby* might have hung before Mrs. TONY WELLER's hostelry at Dorking, for the colours have faded, but fortunately the expression of character is still perceptible. The *Dead Bird* is a delightful figure of a little girl, but the cause of all her woe has to be taken on trust, for no bird is visible. The *Miss Kitty Fisher* excels all the portraits in the room, on account of the beauty of the lines and the apparent unconsciousness of the courtesan who so innocently fondles doves. The face has that "expression virginale, enfantine même," which, according to M. DUMAS, was one of the characteristics of La Dame aux Camélias.

The third president, Sir T. LAWRENCE, is represented by his *Master Lambton*, who is posed, as everybody knows from the engravings, as an infantile BYRON, seated in a most uncomfortable position on what is supposed to be a rock. Probably he was a harmless child, but he is made to appear as the type of youthful priggishness, and his crimson dress looks as stiff as if it were made of red morocco leather. *Miss Croker*, by the same artist, has eyes in a fine frenzy rolling, but she is made to hold an eye-glass in order to aid them. Another president, Sir M. A. SHEE, displays a second boy meditating on the mystery of the world, and, like his fellow philosopher on the opposite wall, he also wears a red dress. Sir HENRY RAE BURN also shows boys in red, and the young MACDONALDS of Clanranald are so boyish it is a pleasure to glance at them, but only a parent or a clansman could endure the constant sight of all their snapping fingers. One of the wonders of our time is the resurrection of so many ROMNEYS, and they are still appearing. Lady HAMILTON appears in her usual white dress, and she wears a bonnet and reads a newspaper. The *Miss Kitty Calvert* was likely to have been produced on economical terms, for ROMNEY was never more careless in his hands and arms. His *Mrs. Inchbald* is a kindly, quiet, elderly lady, with apparently little of the stage about her. This is one of the most interesting of the artist's portraits. WILLIAM DOBSON'S works are a welcome sight. His *Inigo Jones* is preferable, as suggesting genius, to VANDYKE'S portrait; and the *Portrait of a Man*, who appears in a buff coat and cuirass, would pass for an ideal officer of the Parliamentary army. The single portrait by GAINSBOROUGH in the room is *Miss Willoughby*, a rather inane subject, and the artist seems to have been more hasty than usual in completing it.

CONSTABLE'S *Salisbury Cathedral and Deedham Vale* and *Scene on River Stour* are in his usual prolific style, with as much suggestion of detail as a pre-Raphaelite drawing. They would assert their power in any gallery. But for many there is more attraction in the delightful *West End Fields*,

Hampstead, which might be considered as a novel production of the master. The contrast between the light green of the meadow in front with the few dark green trees in the middle distance, by which an immense expanse is suggested, is as simple and effective as any effort of DAVID COX. In the *Hampstead Heath* we have another view which is more broken up. STANNARD'S *Coast Scene* at first appears to be a work by WILLIAM COLLINS. TURNER'S *Mortlake* shows the river as it appears looking eastward. The landscape is flat on both sides of the Thames and there are few trees, yet the place is attractive. TURNER accepted the facts and expressed the character of the scene; the river, sky and the riverside terrace are so treated that the picture is one of his most interesting landscapes. The ships in the *Helvoetsluys* might be cited as evidence that TURNER, although Professor of Perspective in the Academy, was occasionally indifferent to the rules of the science. The *Conway Castle*, by DAVID COX, is hung too near CONSTABLE'S river scene, for it now appears to be over thinly painted.

In the second gallery the Dutchmen are supreme, for the few Flemings appear as satellites. There are over fifty paintings. Every visitor should see *The Painter Dressed as a Soldier*, by REMBRANDT, in which he is seen in his youthful days wearing a steel gorget, a jewelled turban and a gold chain; his portrait of a *Gentleman with a Hawk*, another young man and handsomer than usual; his portrait of *Nicholas Berghem* and his reverential Scripture piece, *The Salutation*. Also LELY'S *William III.*; TENIERS'S *Château*, in which the painter appears as a grand seigneur, apparently to his own amusement; VAN SOMERS'S *Henry, Third Earl of Southampton*, the English MÆCENAS; and the slight but vigorous *Man and Woman with a Parrot*, by JORDAENS. An eyesore in the room is RUBENS'S sprawling *Ixion and Juno*, which was not worthy of admission.

The large gallery has about forty paintings in it, and if the enjoyment of visitors is worth considering, that number is quite ample. GAINSBOROUGH'S *Cottage Door* comes first. The engravings have made it familiar. Unluckily it has become so dark, in a few years it will be as colourless as any copy on wood or copper. GAINSBOROUGH could not emancipate himself from a belief in the necessity of a blasted tree in the foreground, but when we find he had the hardihood to introduce them in St. James's Park, they are almost excusable near the country cottage. LAWRENCE'S *Countess of Jersey* is almost ridiculous, for she appears like an ancient dancing-girl in a country theatre. Pictures of the kind are useful as a warning to portraitists and those who commission them. The portraits by ZOFFANY which appeared of late in the Winter exhibitions, prove that fame does not always come to the deserving. His *Interior of the Florence Gallery* is an example of self-sacrifice. When it appeared in 1780, it was described as "a room in the Gallery of Florence called the Tribune, in which the principal part is calculated to show the different styles of the several masters." If ZOFFANY restricted himself to a view of the Tribune, his picture would not have found a purchaser. It was necessary to introduce figures of a great many connoisseurs, who appear as if they obtained temporary possession of the place, and were able to have additional works brought into it for their delectation. ZOFFANY must have known that he could not do justice to the subject and to himself. With walls painted in vermilion, all other colours became subdued. He submitted to the inevitable, but he would not make the masterpieces of painting and sculpture appear as of less importance than the fine gentlemen. Every picture and every statue is represented with the care of a miniature-painter. The picture, if considered as a sort of conversation piece, is not effective, for the living figures appear of little account beside the works of painters and sculptors. On that account it should be prized, and ZOFFANY deserves to be remembered, for few have been the portraitists who would have shown equal courage. A comparison between REYNOLDS'S *Frances and Henry Greville as Hebe and Cupid* and his *Ugolino* suggests his weakness when dealing with imaginative subjects. The latter is deservedly skied. His *Mrs. Crewe as St. Geneviève* is as innocent of hagiology as the *Mrs. Greville* is of mythology. The fair politician is dressed in white and looks very handsome, but she is a silly shepherdess and her sheep are worthy of her. GAINSBOROUGH'S scene with the *Duke*

and Duchess of Cumberland and Lady Elizabeth Luttrell is becoming cracked, but it still gives pleasure. It would be difficult to say whether the painter was more successful in depicting the beauty of the ladies or the exaltation of the prince who is favoured by such companions. ZOFFANY'S *Life School in the Royal Academy*, 1772, reveals the main object sought in founding the Academy. It was to be a Society for the benefit of a few artists, and which by means of royal patronage was to surpass all other painters' clubs of that time. The absence of students from the picture was no oversight, for teaching was of minor importance. We learn also from the scene that in the life school the Academicians preferred to talk about the points of the model, and hence we can understand why life studies of that time are rare and why such odd figures appear in the paintings. WILLIAM HUNTER, the surgeon, alone appears to take genuine interest in the model.

The two portraits of the boy *Don Balthazar Carlos* and the portrait of *Don Gaspar de Guzman*, the statesman, are as characteristic of VELASQUEZ as any which remain in Britain. The *Virgin and Child*, if not by RAPHAEL is an excellent imitation of his manner, and it is in a remarkable state of preservation. The figure of *St. Gregory*, by VERONESE, is interesting, for the "richly embroidered cope" mentioned in the catalogue seems to be either stencilled or copied from some sort of needlework which had that character. There is a noble portrait of *Ariosto*, by TITIAN, but it ought to have been described as a replica of one in Venice, which according to WAAGEN does not represent the poet—and THORÉ agrees with him. MURILLO'S *Immaculate Conception* corresponds in the colour of the blue and white drapery with the costly work in the Louvre which SOULT carried off from Spain, but the expression of the countenance is quieter and more human. *Time Clipping the Wings of Love*, by VANDYKE, is one of the few allegorical pictures that are always likely to remain attractive. The indifferent business-like expression of the old operator is finely contrasted with the helplessness and terror of the child, and both figures are splendid in line. There is a curious landscape by GIORGIONE, an *Adoration of the Shepherds* by TINTORETTO that is vigorous in light and shade, besides a *Salvator Mundi* and a very large and very dark landscape, *Jupiter and Antiope*, by TITIAN.

If the figure of the man in JORDAENS'S portrait group could be cut out it would make an excellent picture, but the stout lady, who is the companion, could not be made attractive by any painter. The *Holy Family*, by RUBENS, may be described as a portrait group of Madame RUBENS, her boys and a nurse. The picture was evidently a labour of love, and it is not often one of the artist's works is so warm in colour without any garishness. TURNER'S *Snow Storm in Val d'Aoste* has suffered during fifty years, but it is still a most impressive rendering of a scene that portends ruin. Members of the CREWE family are the subjects of four paintings by REYNOLDS on the same wall, but the most interesting are Master JOHN posing as HENRY VIII., and Miss FRANCES as a little woman in a black coat with calash drawn over her head. It is evident that the painter must have enjoyed their assumption of characters equally with the children. LAWRENCE'S *Master Lambton* ought to be placed beside them, in order to suggest the later artist's inferiority and his inability to suggest that a subject was supposed to be seated outside a studio. REYNOLDS'S *Lady Delmé and Children* is superb. GAINSBOROUGH'S *Ladies Walking in the Mall, St. James's Park*, is a charming scene, but the few gentlemen are evidently superfluous, and are only introduced for the sake of the contrast supplied by their scarlet coats. TURNER'S *Bonneville* is last in order. It is nobly composed in large masses, to which Mont Blanc serves as climax.

The fourth room contains examples of primitive art, with some others that in style and principle differ from them, such as the elaborated portrait of PAOLO PARUTA, the historian, by TINTORETTO. Our readers will probably prefer the grand pictures by PANNINI and CANALETTO. The former lived until 1764. He was enthusiastic about ancient Rome, but as faithful copying of ruins was not considered art, and was paid for at a low price, he made pictures by grouping the remains. In those days English gentlemen who visited Rome were able to take more pleasure in ancient architecture than was possible at a later

time, for they had not been taught that Gothic buildings were alone worthy of the attention of a Christian. PANNINI, therefore, found purchasers among them, and many a *Ruined Building and Scene in Rome*, which appears without a name in auction-rooms and dealers' shops, came from his hand. Their downfall in the market, we suppose, is one of the victories of modern ecclesiasticism over paganism. In the exhibition there are two of PANNINI'S *Roman Ruins*, in which we see triumphal arches, temples, fountains, and other survivals of antiquity brought together. They are in ruins, but they are at least free from the sordid surroundings of Rome in the eighteenth century. PANNINI'S figures are well adapted to their use. In one we see a sort of CORINNE, who, we suppose, is bewailing the fall of Rome. Another architectural painting is CANALETTO'S *The Capitol at Rome*. In it we see an opposite sort of treatment. The artist believed that architecture was interesting in itself and did not stand in need of any fallacious interest. He represented the Capitol as he saw it, standing upright with every line perfectly true, and he did not consider it was his duty to make of it an object for pity. Rome had ruins enough for sentimental people. CANALETTO spared no pains in making it plain that the masonry was not decayed, but was still beautiful, and his columns, pilasters, and other details have a sharpness that is without parallel in painting. Mr. RUSKIN was supposed to have given the *coup de grâce* to the artist's reputation; but as long as a painting like the *Capitol* exists and remains inimitable, CANALETTO is not likely to be forgotten.

THE END OF THE RENAISSANCE.*

IT is as difficult to draw a line between parts of a continuous period as to give a distinguishing name to the parts. We are glad to find M. MÜNTZ avoiding the use of the term "Decadence" to designate the time treated by him in the third volume of his "History of the Renaissance in Italy." It does not seem to be an apt term when we know the character of the artists to whom it would be applicable. MICHEL ANGELO, TITIAN, PAUL VERONESE, TINTORETTO, GIORGIONE, LUINI, ANDREA DEL SARTO, CORREGGIO, SAN SOVINO, SAN GALLO, SAN MICHELE, PALLADIO can only be considered as representatives of a decadent age when the subject is considered from some very exalted point of view that is beyond the reach of ordinary men. It is better and safer to imagine that the period in question, which included a large portion of the sixteenth century, was the end of the uprising which is known as the Renaissance. The initial force was not so much weakened as diverted or changed into an agency of another kind, for in the latter days of the sixteenth century works were produced which, if seen in the golden age of the Renaissance, would have excited wonder.

We are not paradoxical when we say that the weakness of what is so often called the Decadence was an excess of power. The knowledge acquired in the earlier and the matured periods was diffused in a way that was mysterious. Every advance that was gained in art in Florence, Rome or Milan inspired artists in the humblest villages. There were no newspapers in circulation, but itinerant artists and monks were an efficient substitute for them. At all times during the Renaissance movement men were versatile, but in the third period they exhibited that quality to an extraordinary extent. It seems, for example, almost incredible that the terrible manner of MICHEL ANGELO could co-exist with the tact that was required to erect and fit up a quiet library for scholars, like the Laurentian Library in Florence. It has been subjected to hypercriticism, and it presents defects. But what is to our mind remarkable is that the creator of mighty contours was able to project himself, as it were, into another being, and become as persistent in the employment of planes and straight lines as he was before and afterwards with curves. An elephant on a tight rope could not be a more amazing exhibition of power.

MICHEL ANGELO'S own peculiarities of style became familiar wherever pictures or statues were produced in Italy. The case of ANTONIO ALLEGRI is an example. All

* *Histoire de l'Art pendant la Renaissance*. Par Eugène Müntz, Membre de l'Institut, Conservateur des Collections de l'Ecole Nationale des Beaux-Arts. III. Italie: La Fin de la Renaissance. Paris: Hachette et Cie.

the training he is known to have received was in his native village of Correggio. But his paintings prove that he was as well acquainted with the methods of foreshortening as if he had served as a substitute for MICHEL ANGELO. Some of DA VINCI'S mannerisms were no less familiar to him. Critics also perceive the influence of MANTEGNA in his works. In those days painting might be compared to conjuring, and every departure from a precedent was a trick which all artists were eager to learn. It was not a subject for speculation and discussion, but a craft, and every craftsman endeavoured to possess as many of the secrets or dodges as he could hear about. Style was a practical affair to them, and a man was not supposed to be competent until he could compel his hand to work in the manner of several artists. It is now difficult to distinguish GIULIO ROMANO'S share in the Vatican pictures from RAPHAEL'S. The assistant was so like the master, a tradition arose that GIULIO was at first the teacher of his chief:—

Thus Old Romano bow'd to Raphael's fame,
And scholar to the youth he taught became.

Yet when GIULIO was compelled to accept service at Mantua he appeared to be the legitimate successor of MANTEGNA. He not only could produce figures that might serve for a continuation of the *Triumph of Caesar* if one were necessary, but he was competent "on horror's head horrors to accumulate," and to represent dragons tearing each other in the slime or demigods ruthlessly struggling on land or among the waves. Put GIULIO ROMANO in any other city where a style had obtained ascendancy and he would be no less competent to make it his own. The adaptability of the artists was so easy, it has led to the greatest confusion, and in consequence the authorship of works in public galleries is continually varied. The late Signor MORELLI gained a reputation by his demonstration of the instability of the methods of connoisseurship in determining the authorship of pictures, and he has had many followers. In the period of which M. MÜNTZ treats, imitation throughout Italy appeared so easy it is a wonder we are enabled to have guarantees for the genuineness of so many pictures, and that the distinct styles of painting are so numerous.

An inapplicable and unjust term can do grievous harm, and there is no doubt the third phase of the Renaissance, because it was assumed to be decadent, has been under a cloud. On that account the third volume of the great work by M. MÜNTZ will probably be considered by many readers as more interesting than its predecessors. The author is exhaustive and impartial, and accordingly he renders full justice to the work of the sixteenth century. Now, most writers who treat of the Renaissance unite in devoting greater attention to the middle period, and their illustrations rarely comprise examples of the earlier or succeeding periods. The majority of the five hundred illustrations furnished by M. MÜNTZ therefore relate to works which are ignored, and on that account they will have the attraction of novelty for many readers. The student will find the advantage of not only possessing an unparalleled number of reproductions of the most suggestive examples in all departments of art, but he is also enabled to realise the mysterious variations which took place in what was the most remarkable of all the ages of development.

There are more things in heaven and earth than are comprised in any system of philosophy, and although much concerning the Renaissance is outside the scope of investigation, it is well to discover whatever research will furnish. M. MÜNTZ therefore begins by the consideration of the forces which were at work among the Italians in the latter days of the Renaissance. He treats of the influence, among others, of patriotism, government, religion, manners, morals, emotions, tradition, antiquity, realism, theories of aesthetics, &c. In his second book he discusses the state of patronage in various parts of Italy. M. MÜNTZ then applies his conclusions to the various departments of art. To architecture the third book is devoted; sculpture, painting, engraving and decorative arts, such as medals, goldsmith's work, furniture, miniatures, mosaics, glass-painting, pottery, textiles and book-binding are also explored. As an animating power which inspired them all, directly or indirectly, we have MICHEL ANGELO, whose name appears with an iteration that is a testimony to his relation with the Renaissance.

(To be continued.)

THE BRITISH ACADEMY OF ARTS IN ROME.

IN a letter to the *Times* Mr. Poynter, R.A., writes:—May I be allowed briefly to call attention through your columns to the British Academy of Arts in Rome? This institution, founded in 1823, in which many artists now well established in public estimation have in past times studied, has of late years, from various causes, retired into a modest obscurity—"in short," as Mr. Micawber might say, it has been shut. This complete abnegation of the principle that an academy to be of any use must be open for study arose chiefly from the fact that it was situated in inconvenient premises in one of the most crowded and noisiest thoroughfares in Rome, and with nothing to indicate its situation, its existence even being unknown to visitors to Rome.

This drawback has been recently removed by the transfer of the institution to convenient and well-lighted rooms forming part of a small colony of studios in the Via Margutta, a quiet street behind the Via Babuino, and in the artists' quarter.

The first rule of the Academy provides that "every British artist, on his arrival in Rome, shall be admitted gratuitously to study in the Academy on application to the Secretary."

For this purpose it is open for two hours every evening, during the winter months, for study from the living model, which is provided at the cost of the Academy, the only limitation being that there shall be not less than three students attending the class.

The Academy also contains an excellent collection of casts from the antique, which is open for study in the daytime; and there is also a good library containing many valuable works on art and general literature, from which, under certain conditions, members and students are allowed to borrow books.

By a new regulation ladies will be admitted as students and various other modifications of the rules suggested in a report recently drawn up by Colonel Slade, at the request of Sir Clare Ford, our ambassador at Rome, have been adopted, which, it is hoped, will put the Academy on a better footing and render it more useful to British artists visiting or residing in Rome.

Recently affairs have worked in a vicious circle. Under altered circumstances, and from the fact of the Academy's existence having almost dropped out of knowledge, applications for admission have declined to the vanishing point; and the discouragement arising from this cause, combined with the rule that the class is not to be opened unless there are three students to work from the model, has favoured inaction and led to the closing of the institution.

The class, established in its new premises, is now regularly open and attended by six students, and this number will doubtless be increased as the advantages offered by the Academy come to be more widely known. Things are changed, no doubt, from the days when it was thought a necessary part of an artist's education to go to Rome; but, in spite of changes of fashion and of other changes more lamentable, Rome still remains the capital and centre of art in its highest expression, and no one who would sound the heights and depths to which the noblest in art has attained can afford to ignore the lessons to be learnt there. There may still be young artists willing and able to make use of its glorious opportunities. They may find it advantageous to supplement their studies in museums and palaces by making use of the Academy life-class, and thus not altogether dropping their practical work.

Further information may be obtained from the secretary, Mr. Alex. Coleman, 53B Via Margutta, Rome.

MONASTIC LANDS AT BRADFORD.

AT the Bradford Free Library on the 13th inst., Mr. T. T. Empsall, president of the Bradford Historical and Antiquarian Society, read before the members of the Society a paper which he had prepared in continuation of one read some time since upon "Monastic Lands in the Neighbourhood of Bradford." In the course of his paper the President said that nearly the whole of the district on the south and west of the town, and to a considerable distance beyond, was formerly in the possession of monastic houses. Indeed, it might be said that for many miles in the directions named it would have been difficult to find any extensive area over which they had not more or less control. Even on the north and eastern sides, if the possessions of Esholt Priory were included, there was a wide belt of land belonging almost without a break to the monasteries. And taking the entire county into the survey, the fact became increasingly apparent to the searcher that the new field of antiquarian labour which the investigation of monastic property offered was much wider than had hitherto been suspected. The searcher found also more fully the consequences of that momentous event, the Reformation, in its agrarian aspect, and was enabled to appreciate the results of the fact that almost in a day a very large proportion of the entire county came into an unsympathetic market, to drift into

the hands of a horde of speculators, or to increase the rent-roll of unscrupulous favourites. But its entire absorption was the work of years—by gifts, sales, barter, or exchange, all the phases of which could only be ascertained through the medium of a huge labyrinth of records. But, in brief, it might be observed that the magnitude of the wealth acquired by the State at the dissolution of the monasteries was simply prodigious. Proceeding to deal with the Knights Templars, Mr. Empsall stated that in 1557 Queen Mary re-established that militant Church, and endowed it with some hundreds of small properties, among which were nearly all that formerly belonged to the late Order within the manor of Batley. Among the items in the list of her endowments of the Order were Crossley Hall, Lees Hall, Thornhill, the manor of Cottingley and Cottingley Hall, and properties at Baildon, Bingley, Hipperholme, and Halifax. Mr. Empsall then proceeded to deal with the Leaventhorpe estate, giving several incidents of its history, from the twelfth century, when it came into the possession of the Priory of Nostell, downwards. In connection with the fate of this property after the dissolution, Mr. Empsall observed that there was much jerrymandering practised with regard to the disposal of monastic land everywhere. In many cases the fact that lands had belonged to the monasteries was concealed by the tenants, and it was often only by accident that the connection was disclosed. It was doubtful, indeed, if the friars themselves were fully aware of the vast extent of many of their possessions till long after the monasteries fell into the hands of the State. He was pretty certain that such was the case with respect to Byland, Jervaulx and Sawley, all of which had considerable interests in the district. One, and perhaps the principal, cause of this was that many of their endowments at their origin were extensive areas, only partially cultivated, and so very imperfectly described and entered upon the registers of the monastery. A number of properties in the Bradford district were referred to, and the estate of the Priory of Esholt was dealt with in some detail. At the conclusion of the paper a vote of thanks was accorded to the President.

THE ROMAN VILLA AT DARENTH.

IT is now found by explorations that at Darenth, although the plan of the structure does not greatly differ from that of other Roman villas in Britain, yet some of the details of construction are of an unusual character, and illustrate in a perfect manner the eminently practical way in which the Roman builder adapted himself to his surroundings. Where stone was abundant it was used, if it served the purpose best, even for roof tiles; if stone was not to be had near at hand the pottery tile was made to take its place. In Kent chalk and clay are the most common materials, and both are made to lend themselves to the needs of the Roman architect. The chalk has been in one case roughly hewn into blocks and laid in courses to form the supports of a hypocaust. The flints from the chalk are slightly squared, embedded in mortar, and, alternating with courses of tile, form a solid wall of much the same character as is found in the neighbouring church, built at a much later time, in all probability from the material of this very villa. The various methods adopted for supporting the floors beneath which the heated air was to circulate are well shown in the several rooms. In one the pilæ are formed of flat tiles laid one upon another to the required height; in another a square pottery tube of the proper length is set on end and filled with flints and earth to increase its stability; in a third the heat is conveyed across the room by means of channels lined and covered in with tiles; while in yet another the supports of the floor (they cannot be called pilæ) are, as before stated, formed of low walls of chalk blocks. A good number of additional chambers, some of them very puzzling, have been laid bare during the past fortnight. At the west side of the villa—that next the river—a congeries of small rooms was found, some of them barely 6 feet in length, but all well finished on the walls, and the floor also, with tesserae and fine stucco. This group of rooms seems to have been served by a conduit from or to the living rooms, and it seems possible that the whole arrangement may indicate some kind of manufacture—for instance, tanning or dyeing. A careful survey of the different levels of the inlets and outlets may, however, solve the problem.

The villa as a whole seems best to compare with that discovered about ten years ago on the property of the late Mr. Dent, of Sudeley Castle, in Spoonley Wood, near Winchcombe, though this latter is scarcely so large. Both are built within a stone's throw of a clear running stream, and the two are very similar in general plan and arrangement. It is but rarely, however, that so complete and interesting an example of a Roman building is found within easy reach of London, and it is not surprising to find that, in spite of the bad weather of the past ten days, a considerable number of people, both from the neighbourhood and from London, have paid a visit to the villa.

LANCASHIRE AND CHESHIRE ANTIQUARIAN SOCIETY.

AT the meeting of this Society, Mr. J. Holme Nicholson, one of the vice-presidents of the Society, presiding, Mr. William Harrison read a paper on "The ancient Fords, Bridges and Ferries of Lancashire." He pointed out that in early times the provision and maintenance of bridges was one of the most important social duties. In times of war fords, and in later times bridges, played a very important part, and the possession of fords and bridges had been the key to the defence of many a city and province, for "if they once may win the bridge, what hope to save the town?" Mr. Harrison, following the course of some of the principal rivers of Lancashire, described the bridges, fords and ferries by which at various times they were crossed, and conveyed to the meeting a large amount of information upon this very interesting department of historical research.

TESSERÆ.

The Destruction of the Colosseum.

FOUR HUNDRED years after the time of Bede the Colosseum was a fortress in the hands of one of the noble families who fought for the domination of Rome. In this it shared the fate of all the larger buildings yet remaining from the antique time. Barons, with names like Frangipani, Orsini, Colonna, and so forth, strove for dismantled Rome like vultures for a corpse. In the Colosseum the Frangipanian birds of prey had their lurking-place. All around them was a desert. Robert Guiscard's Saracens had, at the appeal of Pope Gregory VII., stormed Rome and ravaged it with lance, the edge of the sword and fire. Then were the Aventine and the quarters between the Lateran and Esquiline seen to form one immense pyre. The walls of the Colosseum had withstood even the flames. But there came a power that they were powerless to defy—the power that had given them existence—the hand of man. Three hundred years again, and the Colosseum had become a stone quarry. Now Rome again began to be adorned with splendid palaces, for which the old amphitheatre must give a great part of the building material. The fortress-like Palazzo di Venezia that lies at the opening of the Corso, the mighty Cancelleria, Bramante's stately work, and the noble Palazzo Farnese, adorned with Michel Angelo's renowned frieze, descend both in the body and the spirit from the Colosseum, for not only the latter's blocks of travertine but even something of its Roman style did they appropriate to themselves.

Antiquity of Lewes.

The etymology of the word *Lewes* has given rise to considerable discussion, which has not thrown any great light on the subject: the Celtic, Saxon and French languages have been ransacked for a probable etymon. The hypothesis which derives it from *Hlewe*, a hill, and *Ys*, or *Ese*, water, though one of the most feasible, is liable to a great objection, since the latter expression is Celtic, while the former is Saxon; and we can hardly suppose the ancient inhabitants of the district to have given the town half a name, and to have left it to persons speaking another language, and after a lapse of some half-dozen of centuries, to complete it. There can be no doubt that both the initial and the final syllables, mean whatever they may, are derived from one language, and that that language is the Celtic seems exceedingly probable. *Lough*, in the Irish tongue, is a lake, or, more properly, any expanse of water. Now the Irish is well known to be a branch of the Celtic, the aboriginal language of Britain. *Is*, *Ese*, *Ose* or *Ouse* is another Celtic word meaning water, and is, in its latter orthography, the name of the river upon which Lewes stands. But the stranger will naturally inquire, "Where is the lough or lake in question?" and it will be necessary to inform him that until within a few centuries the level of the Ouse, both above and below the town, was a great estuary, varying in width from a quarter of a mile to upwards of a mile, and making islands of two or three elevated spots springing from its bed. It is worthy of remark that only half a century ago the pronunciation of Lewes by the rustic inhabitants of the neighbouring weald was uniformly *Lough-es*. That the district was colonised by the primeval (Celtic) inhabitants of our island is plain from the occurrence of British words as names of several localities in the immediate neighbourhood, such as Glynde, Caburn, &c., as well as from the British remains which have been discovered on the adjacent downs. There are likewise indubitable proofs that the spot was well known to the Romans; numerous relics of those conquerors, such as pottery, fibulae, rings, &c., have been exhumed in the vicinity, and many Roman coins from Tiberius to Magnentius have been found in and near the town. According to Stukeley, the great Roman road, called Ermin Street, began near Newhaven, at the mouth of the Ouse, and passed Lewes on its way to

London; and there are several traces of Roman encampments on the downs, and even, according to Mr. Elliot, within the town itself. Mr. Horsfield contends that Lewes was the Roman station *Mutuantonis*; but his arguments, though ingeniously applied, fail undoubtedly to prove the fact. That Lewes was a place of considerable importance under the Saxon rule is certain, although we find little recorded of it previously to the time of Athelstan, who granted it the privilege of two mints, while Hastings and Chichester (the only other towns in Sussex so favoured) had but one each. Hence it would appear that, so early as the tenth century, Lewes was, as it is still regarded, the county town. At a considerably earlier date the adjacent vill of South Malling had been chosen by Ceadwalla, king of the West Saxons, as the site of a collegiate church, which was annexed to the see of Canterbury. In after times that see possessed a tract of land extending from Lewes into Kent, a distance of twenty-two miles; and it is curious that a line of parishes lying in that direction is still ecclesiastically subject to the archbishop, under the denomination of peculiars.

Foreign Glass-blowers in England.

The Phœnician processes of glass-making were supposed to have been learnt by the Crusaders, and transferred to Venice in the thirteenth century, where they were long held secret, and formed a lucrative commercial monopoly. The making of plate-glass by blowing was carried on to a great extent at the village of Murano, near Venice, and Europe was long supplied from this quarter with the finest and largest mirrors. In 1575 a privilege was granted under the great seal to James Verselyn, a Venetian, for making Venice glasses, and a glass-house established at Greenwich is said to have soon blown some finer metal than that obtained from Murano. We are indebted, however, to the French for the art of casting large plates of glass, which was introduced in 1688 by Abraham Thevenart; and the French refugees improved many branches of the manufacture, especially the crystal branch, and for a great part of the eighteenth century large quantities of glass bottles were exported to Holland. It appears that in 1589 there were fourteen glass-houses in England, and a great quantity of wood was used in the manufacture; there was, therefore, a petition in that year of George Longe for a patent for making glass, urging as an inducement that he would only have two glass-houses in England, and the rest in Ireland, whereby the English woods would be preserved and the Irish superfluous woods used. (Lansd. MSS. vol. lix. 72.) About 1580 a grant was made (or prepared) for Sir Jerome Bowes to erect furnaces and make drinking-glasses and other glasses like to those made at Murano, "to be sold wholesale or retail, as good, cheap, or cheaper than those brought from Murano, and yet as good in value;" and Sir Jerome was to provide all noblemen of the realm with sufficient store of drinking-glasses, well-fashioned, to be made in Murano or Venice, at reasonable prices, as theretofore sold for. This grant was not to commence until the expiration of a grant for twenty-one years to James Verselyn, dated December 15, 17th Elizabeth, and might be revoked in case of future amity with Venice. (Lansd. MSS. vol. lxvii.) About 1670 a number of artists, the principal of whom was Rosetti, came from Venice, and were patronised by the eccentric Duke of Buckingham; and a manufactory was established at Vauxhall, and was carried on with great success in the firm of Dawson, Bowles & Co., excelling the Venetians and every other nation in blown plate-glass for looking-glasses and coach windows.

Experiments in Acoustics.

It is a fact well established by observation, that when two bodies are in perfect unison, and separated from each other by a space filled with air, the vibrations of the one will be transmitted to the other. From this consideration it is probable that very nearly the same effect ought to be produced in transmitting immediately the vibration of a tuning-fork to a reflecting body, as to duration and intensity, as in the case of transmission through air. This conclusion is strengthened by floating a flat piece of wood in a vessel of water standing upon a sounding-board; placing a tuning-fork on this, the vibrations will be transmitted to the board through the water, and sounds will be produced of the same character as those emitted when the tuning-fork is placed directly on the board. The fork was next placed upon a large thin pine board—the top of a table. A loud sound, in this case, was produced, which continued less than 10 seconds. The whole table, as a system, was thrown into motion, and the sound produced was as loud on the under side as on the upper side. Had the tuning-fork been placed upon a partition of this material, a loud sound would have been heard in the adjoining room; this was proved by sounding the tuning-fork against a door leading into a closed closet. The sound within was apparently as loud as that without. The rapid decay of sound in this case was produced by the great amount of motive power of the fork being communicated to a large mass of wood. The increased sound was due to the increased surface. In other words, the shortness of duration

was compensated for by the greater intensity of effect produced. The tuning-fork was next placed upon a circular slab of marble, about 3 feet in diameter and $\frac{3}{4}$ inch thick; the sound emitted was feeble, and the undulations continued 115 seconds, as deduced from the mean of six experiments. A cylindrical piece of indiarubber about $1\frac{1}{4}$ inch diameter was placed in a tubulated bottle with two openings, one near the bottom and the other at the top; a stuffing-box was attached to the upper, through which a metallic stem, with a circular foot to press upon the indiarubber, was made to pass, air-tight. The lower tubular was closed with a cork, in a perforation of which a fine glass tube was cemented; a small quantity of red ink was placed in the hole to serve as an index. The whole arrangement thus formed a kind of thermometer which would indicate a certain amount of change of temperature in the enclosed air. On the top of the stem the tuning-fork was screwed, and consequently its vibrations were transmitted to the rubber within the bottles. The glass was surrounded with several coatings of flannel to prevent the influence of the external temperature. The tuning-fork was then sounded and the vibrations were kept up for some time. No reliable indications of an increase of temperature were observed. It is evident that an object like indiarubber actually destroys a portion of the sound, and hence in cases in which entire non-conduction is required, this substance can probably be employed with perfect success. The tuning-fork was next pressed upon a solid brick wall; the duration of the vibration, from a number of trials, was eighty-eight seconds. Against a wall of lath and plaster the sound was louder and continued only eighteen seconds. From these experiments we may infer that if a room were lined with a wainscot of thin boards, and a space left between the wall and the wood, the loudness of the echo of a single noise would be increased, while the duration of the echo would be diminished. If, however, the thin board were glued or cemented in solid connection with the wall, or embedded in the mortar, then the effect would be a feeble echo, and a long-continued resonance similar to that from the slab of marble. This was proved by first determining the length of continuance of the vibrations of a tuning-fork on a thin board, which was afterwards cemented to a flat piece of marble.

Romanesque Plans.

In the great majority of buildings—perhaps in all cases where Pagan architecture was employed—the plan is found to be exactly that of the ancient basilica or hall of justice; that is, a parallelogram or nearly a double square, with the semicircular or octagonal recess at one end, usually called the apsis—in the court-house, the judge's seat; but in the church, the sacred place where the altar was placed, and round which sat the bishops and presbyters. In some examples the atrium adjoining was retained, as at San Clemente near Rome and San Ambrogio at Milan; and which, in appearance at all events, would appear to bear some analogy to the more modern cloisters. In some of the later edifices we observe the transeptal arms broken out, as in a Gothic cathedral; but by far the most usual is the simple Latin plan—though we do see some examples of the Greek cross; but these must in all cases be put down as the work of Greek architects, for the Latin architects never altered the more ancient form to which they were accustomed. This simple plan so much preferred by the early Christian church may be traced through the Romanesque to the Gothic, and there can be no doubt it was the excellent basis which lies at the root of all the variations which that style engrafted upon it. This form of plan was used by the early Christians, doubtless because in many cases they found it ready presented before them in the already existing basilicas, which they easily converted into churches; and secondly, because its simplicity was admirably adapted to their wants—the central nave and two side aisles, the northern assigned to the women, the southern to the men; the centre occupied by the choir and sub-deacons, then by the neophytes and candidates for baptism; and lastly, near the door, by the penitents. This simple plan was extended and added to subsequently, though always preserved as the main principle of arrangement, particularly in the neighbourhood of Rome; and the alterations such as the addition of transepts, &c., are much the most usual in Lombardy. The single apsis was never forgotten, but others were added at the end of the aisles, then to the transepts; and as the fashion of building chapels to tutelary saints became more in vogue, they were even broken out laterally. In all the earlier instances the floor was level, except only two or three steps to the apsis, where the high altar was situated; but as the prejudice against burial within the consecrated walls died away and as the Church began to build for itself, we find the introduction of a new feature in the plan and which is treated with the utmost importance—the crypt, which in these edifices appears not as a place of sepulture, but as a sort of lower church, complete with its altars and shrines; supposed by some to have been erected in imitation of the catacombs—those early places of meeting in which the early Christians were wont to hide themselves and to carry on their

simple but sincere worship. Whether this be a mere fanciful supposition or not, what we know is that they were prepared for the reception of the bodies of confessors and martyrs; and as such were treated with as much care and attention as the rest of the church—not sunk into the earth, but often nearly on a level with the floor of the nave, and with a number of steps ascending to the choir above (which had then been removed from its first position in the nave), just as we see it at Canterbury. It is thus at San Miniato at Florence and at San Flaviano near Montefiascone, where there is a complete lower as well as upper church; at San Francesco at Assisi where the saint was entombed, at San Zenone at Verona and many other places. This custom of building crypts and subterranean chapels was continued in the architecture of our own country until the last half of the eleventh century, but probably not much later.

Changes of Style.

There are certain periods in the history of the world, or of individual nations, when some great public event, some discovery, or some cause which deeply affects the public mind, produces a corresponding change in art also. Such for instance, in civilised Europe, was the change produced by the discovery of printing, and the dissemination by its means of the writings and thoughts of the ancients. These led to the study and contemplation of those fragments of antique art which had survived the injuries of time and barbarism, and through their study to reconstitute beauty as the prevailing principle of art, to the subversion of the religious sentiment which had, for many ages, been its leading and all-pervading idea. Again, when from political changes art became gradually estranged from its Italian cradle to be fostered by the growing power of the French kings, and when the victories of the Fourteenth Louis had gained him the title of the Great Monarch, art also was led captive in his triumph. No longer satisfied with beauty, she decked herself to please him in "barbaric pomp and gold;" splendour and display became her ruling principle, and the style called after his name was formed. As we approach still nearer our own era other changes, not so marked, but equally characteristic, might be noticed as influencing art through changes in the outer and surrounding world. All these changes are clearly discernible to us who look back upon them; we can even trace them to apparent causes; but rising gradually and imperceptibly in their own age, they were then not clearly noted as points of departure, or as sufficiently influencing the prevailing taste to form a new and distinctive style.

Conventional Treatment of Natural Objects.

It must be remembered that absolute imitation, difficult in fine art, is almost impossible in many manufactures, whether by hand or by the machine, and therefore imitation can be but a question of degree. Take for instance the application of art more peculiarly to manufacture by machinery, say that of calico-printing. Here the precise imitation of natural objects is impossible since relief is unattainable, although the appearance of relief may be given by light, shade, perspective and colour. But is the mode or degree of imitation peculiar to the artist flower-painter that which is most suitable or conducive to the desired end? In the first place, the processes of production control the application of colour, which must be laid on in separate and unblended masses by means of machinery, and not by that curious and delicate instrument the human hand, while the several tints also must be applied by successive and distinct processes, so that it would seem scarcely possible that calico-printing could compete with the imitative means at the disposal of the flower-painter. Let us, however, allow that by improved mechanical and scientific aids the imitation of flowers, foliage, or other natural objects in light, shadow, growth, colour and relief could be rendered as perfect by machinery as it is by a Van Huysam or David Seghers; still the art is to be applied to a specific use and not to be examined as a picture is. The fabric on which the painting is to be impressed is partly transparent, and the forms are at once blurred and indistinct; the garment it is intended to be made into is to hang full and in folds; thus the light, shade and the very forms of the object which has been imitated are confused and hidden, and that imitation which the manufacturer has been at such pains to produce is entirely lost and destroyed. The garment moves with every motion of the wearer, and any examination of this rare art, as we are enabled to examine the painter's work, is, in the use of the material, as impossible as it is undesirable. Printing again necessitates a constant repetition of the same details; and what would be said of the painter who, instead of a rare flower or group of flowers, offered for our admiration a dozen or a hundred of the same monotonous form, the same unvaried colour, the same tedious arrangement of imitation? If the painter's imitation is sought for by the calico-printer, let at least each flower, each sprig, each group be varied and different. But no, such is not the end in view: it is not to imitate the painter, it is not to

attempt to vie with nature, that is the true aim of the calico-printer; the legitimate art to be applied to such fabrics is at once seen to be simply to decorate or enrich the surface with agreeable forms and colours, and if for this purpose we use the beautiful forms and colours of natural objects, we must use them consistently with the true use and purpose of the material and the means at our command to produce the effect sought for. As the machinery by which the art is reproduced acts by a constant repetition, a geometrical distribution of forms is more or less a necessity which cannot be overcome. As the tints must be laid on separately and successively and cannot be softened or blended, the simplest combination of tints and colour must be sought for rather than the more intricate; a circumstance also called for by the market offered for such goods. If varied hues of colour are introduced to be agreeable to the eye, colour must be distributed according to fixed laws of quantity and juxtaposition, which is scarcely attainable by that mode of imitation which is called naturalistic, but which lends itself readily to that symmetrical and regular display of the plant which is called a conventional treatment, a treatment shown to be consistent with the natural laws of the growth of plants, as it is with that simple impression which flowers in their natural state of growth make on the casual observer.

The Bernardi in Sussex.

Theodore Bernardi and his two sons, Antony and Lambert, were brought to England by Bishop Sherburne in 1519. From Dallaway's examination of the parish registers in Chichester it appears that Antony, the son, died in 1619, aged 105; he was, therefore, only five years old when his father came over to work for Sherburne, and the paintings executed at that time must be attributed to the father, Theodore Bernardi, alone. A part of his paintings in Chichester Cathedral, *quasi*-portraits of the sovereigns of England from William the Conqueror to Henry VIII., were absolutely destroyed by the fall of the spire, February 21, 1861. The rest were taken down when the ruins were cleared away, and have been preserved and refixed, though not in their former position. The two great pictures referring to the foundation of the see by St. Wilfred and Ceadwalla, the Saxon king, and the patronage of it by Henry VIII., are now at the back of the choir stalls under the great arch of the south transept. The portraits of the bishops from the foundation of the see are now in the north transept, under the great window at its north end. For the history of art these works had lost much of their interest in consequence of their treatment by Tremaine; but there is in existence a series of untouched paintings, unquestionably by the elder Bernardi. These paintings are at Amberley Castle, Sussex. This castle, in Sherburne's time, was one of the residences of the Bishops of Chichester. An upper chamber in it has still considerable remains of oak panelling, of Sherburne's time, and bearing his initials, R. S., carved as well as painted. In the panels are painted a series of female figures, the meaning of which was long a puzzle to antiquaries. The series consisted of nine portraits; of two of them now very little remains, and their remarkable coats of arms identified them as a series of "The Nine Worthy Women of the World," which painters and romancers of that period were fond of delineating, the artist or the poet being very much given to make his own choice as to the personages to be enrolled in the Worthy Nine. Amongst those depicted at Amberley we have Semiramis, Queen of Babylon; Thamaris, Queen of the Massagetæ; Queen Sinopis of "Ennay;" and Cassandra; with, probably, Minthia and Hippolita, Amazons. All of them had explanatory legends, but these were painted out, most likely, in the time of Charles II., when some additional painting was certainly done in the room, and are now only partially displayed afresh. Although the margins were thus repainted, the pictures themselves were not interfered with, and Robert Sherburne's initials, R. S., may still be seen upon some of them. These must be regarded as highly valuable specimens of Bernardi's work. His sons continued to exercise their father's profession in Chichester, and apparently in a descending scale. Lambert Bernard, son of the before-mentioned Lambert, was baptized in 1627, and is probably the same "Lam. Bernard, Pict." whose name was noticed on the cathedral weathercock when it came to the ground in 1861, with the record that he gilt it in the year 1675. To the first Bernardi, commonly believed to be Theodore, it is usual to attribute a good deal of Renaissance arabesque work which at different times has been exposed from beneath more modern coatings on the nave vaultings of Chichester Cathedral, and which is to be seen very extensively on the vaulting of the choir of the neighbouring abbey church of Boxgrove. Although the head of the Bernardi family is commonly called Theodore, it is worth notice that in Bishop Sherburne's own papers, as pointed out by the Rev. G. A. Clarkson ("Sussex Archaeological Collections," vol. xvii. pp. 211, 212), "Lambert Bernardi, the painter," is at least twice mentioned, and there is no mention of Theodore.

NOTES AND COMMENTS.

THE Lord Mayor of Liverpool appears to have been taken to task for an utterance in his speech in aid of the unemployed. He may not be exceptional in urging the claims of the necessitous, but for the sentimental folk it would seem that he put in too plain language that the vagabond unemployed spoil the opportunities of those willing to work. Too many of the unemployed, it is well known, prefer wages to labour. If work is offered to them it is refused, though they condescend to accept half-crowns if it involves no exercise of their muscular limbs. These stand in the light of those unemployed who are only too willing to give a day's work for a moderate wage when times are bad. The Lord Mayor should probably have been more sentimental. He should not perhaps have used language so blunt, though so appropriate and so understandable. His words as reported mean that one cannot help those who will not help themselves; that they must be let "go to the devil." He could have said, "If mankind cannot help them, they should apply to angels." The Lord Mayor should rather have been praised for pointing to the fact that so many refuse work and then come as paupers on the country under the specious term of "the unemployed."

THE painting of the Hammersmith Bridge was a source of amusement to all who passed while the operation lasted. It was a fascinating spectacle for the building workman. It might have been an object-lesson devised with the intention of convincing him that when the contractor was abolished and all works were controlled by a county council, then labour would become a pastime. The people of Hammersmith became anxious about their share in the experiment, but they were persuaded that the playing with colours would not be more costly to them than to remote parts of the Metropolis. The estimated cost of the work was 1,000*l.*, which was a very large sum for one bridge. Then by manœuvring 50*5*l. was voted for extra work. It was revealed on Tuesday that the expenditure was 2,186*l.* In 1888 the cost of the painting was 85*5*l. It is needless to say the bridges committee declared that no fault was attributable to anybody. But a great many experts could be produced who would maintain the contrary. Whether the men were to blame for enjoying themselves when an opportunity was given them to have a prospect of Thames scenery is an ethical question over which modern moralists will differ. It is evident, however, there must be no attempt at criticism of any extravagance over what is termed labour, for Mr. JOHN BURNS threatened to "whip the Moderate Party hand and feet if they dared to go against labour and in favour of the contractor."

RICHMOND PARK has only one suitable approach from London. But the streets of the town are not the most desirable for riding or driving. The pleasantest way is that known as Priory Lane, which leads from the main road to the park. It has the appearance of belonging to a property that is in Chancery, for it is not kept in good condition. Foreigners must be amazed when they pass along it, for in no other country is a public or royal park reached by an avenue that is so neglected. The Office of Works would desire to see Priory Lane widened and properly kept, and suggestions have been given to the London County Council on the subject. The work would cost 11,000*l.* or 12,000*l.*, which is a large sum to pay for an improvement that would be at least as beneficial for the county of Surrey as for the Metropolis. There is a third interest which is to be considered, and which is more direct—that of Wandsworth. The propositions of the District Board are to pay a sum of 5,000*l.* if the London County Council will form the approach, to acquire the necessary land and buildings, and to re-erect the fences which will have to be set back. The expenditure that way would be insignificant, for the fence is only a wooden paling, and the only building is a cottage that is as neglected as the road. As the London County Council is in a moribund condition, the improvement committee do not care to meddle with an undertaking that can only be described as having utility, and could not be readily turned to account as an advertisement. The improvement is therefore to be dropped, on

the ground that whenever the adjoining land is laid out for building the owners will have to set back their building line. So far the game has been played by the Office of Works assigning the duty to the County Council; the Council passes it on to the Wandsworth District Board; the Board returns it to the Council; and the Council is now on the look-out for the victim who will have to undertake it at his own risk.

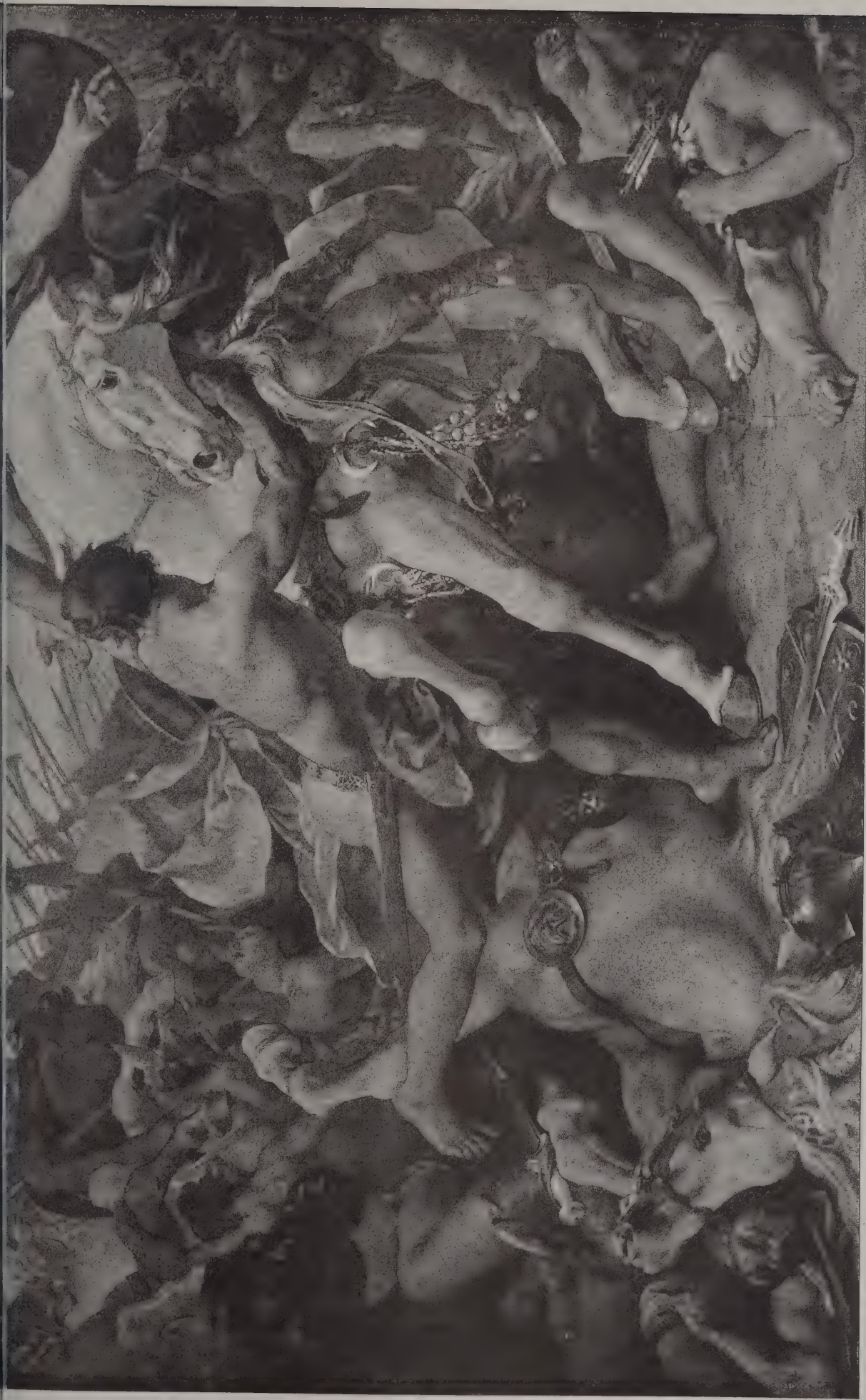
ACCORDING to the late Professor FREEMAN, the greatest building of Aachen is a direct copy of the greatest building of Ravenna, and it is only while we keep within the shadow of his minster that we really feel we are in the city of CHARLEMAGNE. From its architectural as well as historical importance the old minster cannot be watched too carefully. We hope, therefore, it is through an excess of interest in the preservation of the minster, rather than through their militant propensities, that the civil and ecclesiastical authorities of Aix-la-Chapelle are at loggerheads over the custody of the building. The "Staatsprokurator" claims the responsibility on the ground of being president of the body that was founded in 1849 in order to raise money for the restoration of the building. He considers that from his office he has a claim on the building, in order to be sure that what remains of the subscriptions is properly expended. But the clergy can refer to ancient precedents to support their position as proprietors for the time being of the building. Moreover, it was declared by the founders of the restoration fund that the control of the clergy over the minster was not to be changed. It has yet to be discovered what action will be taken by the Archbishop of Cologne in the affair, but it would be hard to expect from him a decision in favour of the secular authority.

THE report which M. GUADET has published throws some light on the decision of the judges over the designs for the Exhibition of 1900. There was no need of voting about the designs which were awarded the highest and lowest classes of prizes. The second and third classes alone gave rise to differences of opinion. The conclusion of the judges was that the task of designing and superintending the execution of so colossal a project is beyond the power of a single architect, for what is contemplated is the creation of a novel city. The use of the competition was in obtaining a remarkable diversity of ideas which could be utilised in preparing a definite plan. Every design in which it was proposed to cover the Seine was eliminated. Some of them showed much talent in the palaces of arts or of *fêtes* which were proposed to be constructed over the river between the Champs Elysées and the Esplanade of the Invalides. Other excellent designs which contemplated the destruction of several trees were also rejected, for the judges would not tolerate the infliction of an enduring injury to Paris for a temporary necessity. The bridge which is required was approved with hesitation; and on the understanding that it would be in a position to always appear in line with the dome of the Invalides. The Palais de l'Industrie, in which the exhibitions of the Salon are held, is doomed, for its removal will enable some splendid perspectives, taking in both sides of the river, to become feasible, besides allowing of easier communication between sections of the exhibition. As regards the Eiffel Tower, the judges suggest that it will be preferable to leave the lower arches on the ground open as at present, rather than to fill them with conservatories or winter gardens. In conclusion, the judges are unanimous in testifying to the abundance of original ideas, the boldness of the conceptions and the artistic merit which the competition called forth, and which were worthy of the French school of architecture.

M. DETAILLE has been elected President of the Société des Artistes Français, an office for which he is qualified in every respect. Whether he will be able to display at the next Salon the portrait of the Prince of WALES which was commissioned by the Emperor of RUSSIA, is at present uncertain. M. BONNAT, who was M. DETAILLE's predecessor, will remain attached to the Society as honorary president. M. CHARLES GARNIER, the architect, is one of the vice-presidents.

The Architect, Jan. 18th 1895.





INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, PETER LANE, E.C.

THE HISTORY OF CLOVIS, No 3.
THE FRANKS VICTORIOUS.
FROM THE WALL PAINTING IN THE PANTHÉON PARIS.
BY JOSEPH BLANC.



PHOTOGRAPHED BY BEDFORD LEMERE & CO

Jan. 18th 1895.



INK- PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

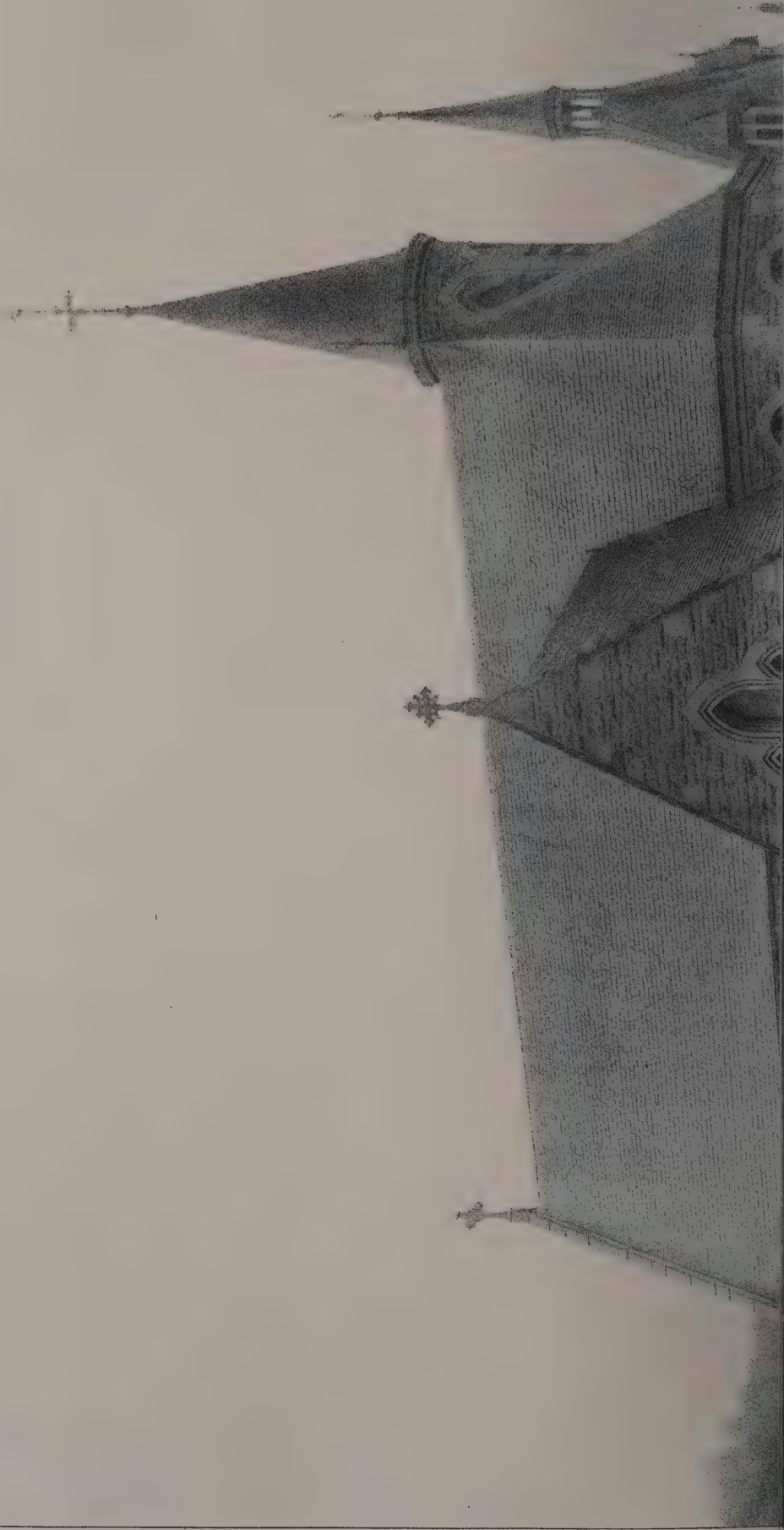
CATHEDRAL.
ER, Architects.



STATION HOUSE
The late ANDREW



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THE REDEMPTIONS' CHURCH, PERTH.
VIEW FROM NORTH-WEST.

The late ANDREW HEITON, Architect.

ILLUSTRATIONS.

[THE HISTORY OF CLOVIS...NO. III.]

IN the painting which we reproduce this week, M. BLANC has represented the issue of the combat in favour of CLOVIS and the Franks. M. BLANC'S work is remarkable for his success in depicting figures in most difficult positions,

SEDILIA, ST. PAUL'S CATHEDRAL.

THE REDEMPTORISTS' CHURCH, PERTH.
STATION HOTEL, PERTH.

THE illustrations show two more of the late Mr. ANDREW HEITON'S works, and will, with the others given, suggest his versatility as an architect.

SOCIETY OF ARCHITECTS.

THE meeting of the Society took place on Tuesday, the 15th inst., Mr. Hamilton, president, in the chair. Mr. F. Aumonier read the following paper on "Wall-papers: their Manufacture and Design."

Mr. AUMONIER said the first consideration for the manufacture of a wall-paper is the choice of suitable materials: paper, colours, mica-powder, bronze, flock, size, &c. The paper is bought by the paperstainer in huge rolls or reels, each containing about eighty pieces of 12 yards each, or rather more than half a mile in one continuous length; the colours are obtained of colour-makers mostly in a pulpy state, unsized, but otherwise ready for use, in great casks, and they are mixed with one another, and with black and white, to make all tints. Their first essential to meet present public requirements is that they shall be non-arsenical in their nature, and next that they shall be reasonably fast to light, a matter to which great attention is paid, especially by the leading block-printers. Powdered mica is made from the waste pieces left from the manufacture of mica plates for covering gas jets and for other purposes, crushed into dust. Bronze powder is too well known to need description. Flock is wool cut or ground to a powder and dyed to any tint; and size is made from the skins of animals, and is a perfectly sweet and wholesome material, practically imperishable in a dry atmosphere. After the materials are provided come the manufacturing processes, the first of which is colouring the grounds. These may be dull or body grounds, satins or micas, and they may be coloured by hand or by machine. If colouring by hand is decided on, then the process is that illustrated by the two slides showing a hand-colourer and his boy at work. The man has a large round brush in either hand; with his right-hand brush he lays a broad streak of colour down the middle of the piece; he then roughly spreads it with both brushes; his boy follows him with a square brush; the man then takes a clean brush in his left hand and lightly smooths the wet surface of the colour, leaving it finished and practically free from brush marks.

If coloured by machine, the reel of paper is adjusted to the machine, the end of it is passed over a flat table covered with a revolving endless felt or indiarubber band of the full width of the piece, and in the course of its progress the surface of the paper is first covered with colour and then smoothed by contact with brushes, leaving the machine with a perfectly even coating, when it is automatically hung up to dry. When satin is required, the paper goes through one or other of these processes with a specially prepared colour, and when dry it is rubbed over with powdered talc and polished by friction. When mica is required, the wet colour is dusted over with the powdered mica, which adheres to it firmly. The choice of a design and the cutting of the blocks are the next operations. The design for an ordinary English paper should be 21 inches wide, and of a not greater length. The most careful attention must be paid in the drawing to ensure correctness of fit when repeated, both horizontally and vertically, and no pains can be too great to prevent the recurrence of bad, unintentional lines, when hung this being one of the most common and troublesome defects, even in the drawings of experienced artists. The drawing is put into the hands of the block-cutter, who makes a careful tracing of it, transfers the design to the block, and cuts away the parts not required, leaving the design in relief ready for printing. If the pattern is in one colour only, it is finished in one block, but if of many colours, a separate colour is required for each. The blocks, which are made of deal faced with pear-tree wood, have little points at the corners, by means of which an accurate fit is insured, both on the repetition of the leading block and on the

succession of other colours. Broad massive patterns are cut entirely in wood, fine ornaments and small details are put in in metal, bands of thin copper being bent or filed to the shape required and driven edgewise into the wood bit by bit until the design is completed. The printing-table is extremely simple in its arrangement, consisting of a strong frame with a hard wood or stone bed about 30 inches by 36 inches, with two levers, one near the floor and one overhead, joined by an upright bar, enabling the printer by an easy motion of his foot to give the block any amount of pressure required. These printing-tables look so very primitive that it is difficult to imagine that nothing better can be found for the purpose. Specifications of several inventions intended to replace them moulder in the dust at the Patent Office, while the old tables have outlived them all, remaining now much the same as they were a hundred years ago, and all the beautiful works shown by English makers at the great international exhibitions were printed upon them. By the side of the printing-table is another strong frame supporting a shallow case lined with lead, called a "slush box," in which is a wet pulpy mass covered with a waterproof cloth. On this the colour sieve is laid; a boy spreads the colour evenly on the sieve, the printer dips the block into it, transfers it to the paper on his table, presses it, and goes on repeating the operation until the piece is finished, when it is hung up to dry at the ordinary temperature of the atmosphere. In many-coloured papers the prints are successively laid and fitted in their places by means of the little pins at the corners, and there is practically no limit but the sordid one of cost to the number of colours that may be used.

Of late very artistic effects have frequently been produced by printing in transparent colours (specimens of which are on the walls), and there is a great field open for the further development of this process, or a combination of transparent and body colours. Some decorators have private designs in skeleton form printed for them in one colour, and produce uncommon and often pleasing effects by finishing parts of the pattern by hand-painting or stencilling. There are many subdivisions of block-printing, which it would take too long to describe in detail. One is the making of stripes, which are now much in demand. A brass box or trough, of V shape, is made; the bottom is perforated with openings of the widths of the stripes required. This is adjusted to a hand machine and filled with colour, the paper passes between the box and a drum covered with an endless felt, which is turned slowly round by one boy, while another walks backwards with the finished paper until the piece is completed. Another minor process is embossing, an operation by which a grain or figure is given to the surface of an otherwise finished paper. A device is engraved upon a metal roller, upon which rests another roller of double the circumference, made of paper put in sheets edgewise on a spindle and squeezed up very tightly by hydraulic pressure. The two rollers are together under pressure until the device engraved on the metal roller is impressed upon the other, when the paper is passed between them, and receives the impression of the engraved device, which it retains permanently. Such embossing gives shadow and some relief from the monotony of an otherwise flat surface. Flock is a beautiful material, to the working of which great attention has been paid from the time that paperstaining first became one of the industrial arts. It is not only very fine in effect from the great richness of its colour and the texture of its surface, but it is susceptible of treatment in a great variety of ways, and is very durable.

The records of the Patent Office date from before the Great Fire of London, but I believe that even earlier than that a royal charter was granted to a French refugee for the manufacture of flock papers for wall-hangings, and it is certain that very many patents have since been taken out for improvements connected with its application to wall-papers. Amongst the most important of the ways in which it is turned to decorative account are raised flocks, which are either coloured, or in the white for painting over. By far the greater part of those made at the present time are on coloured grounds, and they are hung without painting until they are soiled, when a coat of paint makes them again fresh and bright. The great picture-gallery of Buckingham Palace is hung with one of the designs shown, painted and shaded in imitation of silk, but the colour used there is a cold grey, not very pleasing as a background for pictures. Other designs were shown for dados, walls and ceilings. These papers are easy of application, very inexpensive compared with other materials producing a somewhat similar decorative effect, the back is solid, allowing no harbour for vermin, and they are free from any offensive smell. The raised designs look so sharp, and are left with such a fine even surface, that many people imagine they are in some way cut out or stamped, but such is not the case. They are printed in a very sticky oil colour, the printed paper is passed into a drum with a linen bottom (as shown on the screen), the flock dust is thrown upon it, and the drum is beaten vigorously with a cane, causing the flock dust to adhere to the oil colour and form an even coating. The

two operations of printing and flocking are repeated time after time, until the required amount of relief is attained, the sharpness of the arris and the general evenness of the surface being dependent upon the skill of the operator. Silk flock, and flock on a silk background, are the most modern and the richest outcome of one branch of the paper-stainer's art. There is an idea abroad that flock, green flock especially, is highly arsenical, but it is not founded on fact, as no arsenical preparations are used in dyeing this material. With respect to arsenic generally there is now but little apprehension as to wall-papers containing this poison. All the principal makers have abandoned the use of arsenical colours, and the danger is now rather that a wall-paper free from arsenic will be erroneously condemned as arsenical, than that an arsenical one will be passed as harmless. The action of the National Health Society in establishing a standard test for arsenic has done much good, but to use it effectually it is essential that all reagents should be most rigorously tested before they are relied upon.

With reference to machine-printing, there has been an extraordinary development within the last decade. During the earlier part of this century there was a very high protective duty on the importation of foreign paperhangings, as much as 1s. per yard super (*vide* "Cyclopædia of Useful Arts and Manufactures," p. 273), and paper-stainers, having little to fear from foreign competition, did not over-exert themselves to improve their trade. Nevertheless there were many applications lodged for letters patent in connection with the art, and not a few of them aimed at the production of what are now called "engraved" or "sanitary" papers; but the processes were crude and clumsy compared to those now used, and the patents were either not carried beyond the stage of provisional protection, or were allowed to fall into abeyance. The first great cause that gave importance to machine-printing was the invention of Gamble and Fourdrinier, the practical result of which was the manufacture of paper in continuous lengths. Prior to that pieces were made up into 12-yard rolls by sheets joined together, and the paper-stainer had to await the arrival of the exciseman before he dared to use the pieces so joined. Fourdrinier's invention was followed by one to effect the more rapid drying of machine-printed papers by a system of boxes heated by steam, and when these inventions were followed in 1861 by the total abolition of the paper duty, a fresh and vigorous impulse was given to machine-printing, improvements in which are still constantly being made.

The factory of Messrs. Allan, Cockshut & Co., of Old Ford, is equipped with every known contrivance for turning out the best machine-printing it is possible to produce, both surface-printed and engraved. The works extend over nearly three acres of ground, covered for the most part with modern fire-proof buildings filled with beautiful and ingenious machinery. For surface-printing the design is outlined with copper bands driven edgewise into a wooden cylinder, and the solid parts of the pattern are filled in with fine felt cemented to the bottom of the spaces between the copper walls. The rollers are adjusted to a powerful machine as shown by the diagram. Each colour has a roller to itself, and is provided with colour-box and endless sieve, which supply it with colour, and it rotates on its own axis round a revolving big drum. The paper is passed between the drum and the rollers, receiving the printed impression from each in turn, and leaves the machine finished. It is then automatically carried into the drying-room, which it traverses from one end to the other, turns round, still automatically, and slowly makes its way back to near its original starting-place, dry and ready to be rolled up. The animal size of the block-printer is replaced by various kinds of gums that bind the colours firmly to the paper, and which do not suffer from the great heat to which the papers are subjected in drying, which would spoil sized colours.

Engraved, or "sanitary" papers, to give them the title by which they are best known, are printed in varnish colour from designs engraved on copper cylinders, and some of them are beautiful interpretations of the original drawings, the process lending itself well to the reproduction of artistic effects.

In the first place the design is transferred to the roller by a photographic process, after which it is engraved entirely by hand. The ground of the paper and the high lights of the ornament are left clean and bright in the copper, the printing being done only from the indentations, the same as in copper-plate engraving. The machines for printing these papers are very heavy and strong, on account of the great weight of the rollers, and it is found desirable to have a separate engine for each printing-machine, in order to insure greater rigidity and a more perfect control over the rate of speed at which the machine is run. Briefly, the engraved roller revolves in a bath of coloured varnish, by which the lower part of it is entirely obscured while the upper part is kept clean and bright by a doctor, which removes all the superfluous colour, and the roller on contact with the paper prints only the colour left in the sunk parts. The doctor

is a thin plate of hard steel set dead true against the copper roller; and it speaks well for the perfect accuracy with which these machines are made that such delicate work can be done in an almost faultless manner, and at a speed which secures for the manufacturers a remunerative profit, although such papers sell even retail at very low prices.

A table was shown of samples of various tints with their relative money values, varying from 1 to 250, the object being to remove a prevalent misconception that change of colour has no appreciable effect on the cost of a wall-paper. Great stress was laid upon the importance of cleaning off all old papers before putting new ones on the wall, and specimens were shown of masses of ten or more thicknesses of paper recently stripped off the walls of good houses in the West End.

Slides were shown illustrating wall-paper and decorations by well-known artists, all block-printed and in many styles, several of which were exhibited at Chicago; and a general view of Messrs. Wm. Woollams & Co.'s stand at that exhibition was also shown.

A vote of thanks, proposed by Mr. Lovegrove, seconded by Mr. H. Goodall Quartermain, and supported by Mr. Crace, Mr. Essex, Mr. Allport, and Mr. Heaton, was passed to Mr. Aumonier for his paper.

SCOTTISH NATIONAL ARCHITECTURE.

A LECTURE in the Corporation Art Galleries, Glasgow, was delivered by Sir John Stirling Maxwell, Bart., of Pollok, on the subject of "Scottish Architecture." The lecture was one of the Corporation art series. Ex-Bailie Shearer presided, and there was a large attendance. Sir John at the outset said he would try to show them that Scottish architecture displayed an orderly development which could be easily traced and understood. The earliest buildings they had to notice were churches, although churches were much less distinctively Scottish than domestic buildings. The Norman Conquest did not extend to Scotland, but Malcolm Canmore and his successors welcomed Norman and Saxon immigrants in such numbers that this country shared all the advantages of the Conquest without any of its oppressions. This was the great church-building period all over Europe, and Scotland was not behind other countries. Nearly all the Episcopal sees and great religious houses were founded at this time. Holyrood, Melrose, Kelso, Jedburgh and many others owed their existence to the generosity of David I., and it was no wonder James I. called him "a sair sanct for the Crown." The little church at Dalmeny was as beautiful as anything of the time in France and England. After 1236 there was an architectural hiatus of a century, in which gap the church of St. Monance, in Fife, stood nearly alone. After 1424 a number of collegiate churches were built; and later on they saw the French influence in such buildings as Trinity College Church in Edinburgh—a church which had been swept away by the North British Railway Company to make room for the Waverley Station. Roslyn Chapel and St. Giles's, with its crown steeple, and one or two Gothic churches, were next alluded to, before reference was made to the domestic buildings. The earliest castles they had in Scotland were of the thirteenth century, and Bothwell Castle, Mearns Castle, Rothesay Castle, and Borthwick Castle—the latter with the most majestic fireplace in Scotland—were touched upon and their special features pointed out. Building revived in Scotland under James I., and the Reformation helped to account for the very large number of houses which were built at this time. The castles of this period afforded the commonly accepted type of Scottish architecture. Maybole was a good example of the so-called "L" plan, and Castle Fraser was an example of the "Z" plan. Fyvie was a later example of the Scottish style, and was the most imposing castle in Scotland still inhabited; but it showed signs of the invading Renaissance. When they looked at Argyll's Lodging in Stirling, built thirty years after Fyvie, the extravagant turrets and corbelling were all gone. The roof and gables had reasserted themselves. This was a beautiful type of a large town house, and was the type which held out the best future for a national architecture in Scotland, if people would only be less ambitious and condescend to look at it. It was quite suited to modern habits, and it all seemed ready and waiting for the touch that could change it into a perfect modern house. Heriot's Hospital gave them some notion of the last strange efflorescence which architecture made at the time when it fell into the stifling embrace of the Renaissance. The lecture was illustrated with a series of photographs and drawings.

The Meeting of the Liverpool Architectural Society, which was announced to be held on Monday, the 14th inst., was postponed.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute of Architects took place on Monday evening, when Mr. F. C. Penrose, F.R.S., president, delivered the annual address to students, his subject being entitled

Study of Buildings To-day and in the Past.

The PRESIDENT in alluding to the examinations said that care had been taken to make the examinations of the Institute, whilst being a fair test of efficiency, yet not so severe as to be an inaccessible bar to any whose talents showed real sympathy with the profession of architecture. Besides drawing and the practical studies of construction, there were some subjects which the student should recognise as not unconnected with architecture, namely, geology and archæology. Good architecture in all time had been the development of what has gone before, and unless the new was well keyed into the old there was no reasonable prospect whatever of success. Too close an adherence to the past was also to be deprecated, except in the case of those who might be engaged in the restoration of churches and other ancient buildings. In works of that nature archæological conditions should be paramount, or only controlled by the requirements of Divine service or other necessary use; but it should be historical archæology and not selective. In restorations it was scarcely possible to be too conservative. It had not infrequently happened in church restorations that valuable historical links had been sacrificed to the preference of the characteristics of some particular period. If additions had to be made to old buildings of various styles, the circumstances would generally point out which of these styles ought to be followed. The architect, however, should not allow individual fancy to prevail too much in selection, but should endeavour to put himself as much as possible in the position of a surviving partner to the designer of the original building, and should think at least as much of his predecessor as of himself. In new creations of his own, carried out in any recognised style, he would by all means advise him, whilst inspired and guided by archæological teaching, not to allow himself to be confined and hampered by it. The new materials and means now available should not but lead them, as years went on, more and more away from the past; but to succeed it must be done, not by revolution, but by evolution. One of the most important considerations at the outset of architectural study was to entertain sound notions respecting materials, not only as regarded strength and durability, but as to their proper employment, and this was especially the case when they considered the number of new materials which were now available. He did not advise the patronage of novelties, but of such as had already won the favour of practical men. In actual building it was well to remember that, whilst studying all reasonable economy, which was a duty in almost every case, sufficient solidity of construction and well-chosen material and a good shape, which generally involved but little, if any, extra cost, were far preferable, and would give more satisfaction both to the employer and the general public than any effect to be obtained by ornament. To give a simple illustration, a plain chimney-stack, surmounting a roof of good thick slating, was far more effective than an elaborately-panelled stack, rising from a covering of flimsy character, of which there was now too much in the market. In the earlier part of this century there was a great abuse of stucco and Roman cement, which were used in situations quite unfit to endure the action of the weather and the test of time. Fluted Corinthian columns, with their base mouldings and capitals and other enrichments, were constantly executed in these materials, and provoked a pasquinade in travesty of the compliment paid to Augustus for having found Rome brick and left it marble:—"Our George he did the same, but did it faster, For he found London brick and left it plaster." That skit, and the stronger artillery used by A. W. N. Pugin in his "Contrasts" and other writings, brought in the desire for more truthful materials. The reaction against stucco, however, was carried to such a degree that it has been dispossessed of even its legitimate field, that of clothing plain brick or rubble walls, for which it was frequently used by the Greeks, the Romans, by the great architects of the Italian revival, and constantly in Mediæval works—for instance, by William of Wykeham—as an external coating of flint walls. Plaster surfaces should, indeed, never be used so as to pretend to be anything different from what they were; they should only be employed when desired to cover rubble or uneven brickwork, and when so treated should not be blocked in imitation of ashlar masonry. For such restricted work as this the architect would have a good argument to offer, drawn both from reason and authority. To the complete oscillation of the pendulum of fashion away from the over-use of stucco he attributed a great mistake which had often been made in church restoration, in which we too frequently found that the rubble walls of the interior had been denuded of their original coating of plaster, a covering which in ancient times was fre-

quently adorned with frescoes, and which might very properly be so treated now, and the walls so exposed exhibit a very forbidding aspect of confused pointing and general untidiness. Everything which had to endure strain and pressure or the searching of the elements should be of better material than stucco, as well as everything that was to show the hand of the artificer in carved or moulded work, which had better be left out altogether than be displayed in external work at any rate, as mere cast repetitions. The objection to the mechanical repetition so disagreeable in plaster enrichments did not apply so strongly in terra-cotta, because in the kiln a certain amount of variety was produced, and, therefore, both on this ground and because of its greater durability it was much freer from objection; but it should be used with greater reserve than it often was, and with more consideration for the fitness of the material with which it was to be associated. It might combine with an exterior otherwise mainly brick with excellent effect as a superior quality of the same nature. The old houses at East Basham, Norfolk, and Sutton Manor, near Ripley, in Surrey, were good examples of this kind. It should not be used in combination with rubble or flint walling, and it was out of place when the general effect was supposed to be masonry, but with terra-cotta simply substituted for stone. But it was in the proper employment of steel and iron where chiefly the new materials demanded the exercise of thought, and this question became every year more prominent. Iron had become admirably useful and was constantly employed as a concealed material; but the time must come before long when for some classes of building it would have to take its own place in architecture; and the best way to meet this requirement might very fitly occupy the thoughts of the rising generation of architects. He did not pretend to have any practical suggestions to offer; he had never had to grapple with the problem. He was inclined to think that the proper treatment of shop fronts would bring about the solution; for there was now a marked contention between the ground storey, where every possible square foot of plate-glass was demanded, and the more usual and quasi-domestic character of the superstructure. Nothing was more dreadful in appearance than the façades which we often saw with a display of solid architecture, where the orders and pedimented windows seemed to rest, as if by magic, upon a surface of plate-glass, occupying the whole breadth of the front at the street level. In this contention the shop-front must carry the day and the old-fashioned form of the upper storeys would have to yield. How this was to be done he did not venture to advise, but it would rest with them to work out the desired result. This they would do by always aiming at using building materials in the most natural way, and then truth of construction would produce a satisfactory result if directed with the intelligence which grew from proper study and a feeling for proportion.

The Institute had received in trust, through the liberality of the Duke of Devonshire, a fine collection of drawings by some of the old masters in architecture. Referring to M. Chedanne's drawings, the President observed that into the very interesting historical and archæological points illustrated in the drawings he did not propose to enter. He wished to call to their attention the wonderful elaboration and refinement of finish in the drawings, and the pains which must have been taken to ascertain and accurately, as well as artistically, delineate so much valuable detail. Their best draughtsmen would be the first to recognise that they in England had nothing comparable to them. Although he did not think that, considering their methods of education and their requirements, they would be justified in urging their students to attempt rivalry with such works as they saw there that night, it was well worth the attention of those who wished to improve their draughtsmanship beyond the utilitarian limit to examine well M. Chedanne's drawings for the sake of their stimulating effect.

Mr. R. PHÉNÉ SPIERS read a summary of M. Chedanne's report to the Academy of Fine Arts, France. M. Chedanne observed that before commencing the work of restoration he had already noted, when measuring the plan, that the axes of the small altars, which formed the chief elements of the interior decoration, and those of the circular niches or apses, formed in the thickness of the wall, were in the same line. That fact gave him an absolute proof that the builder of the edifice was also its decorator. His researches disproved the hypothesis of Piranesi that the greater arch formed part of a series which constituted the outer skin of the cupola. Further examination also disproved the assumption that the dome of the Pantheon was constructed in light porous stone and pottery, and would not be able to carry the bronze flower bosses in the centre of the coffers and on the ribs, as he found bronze cramps built into the solid vault to carry those features. The whole vault was, in fact, built in solid brick, and was supported at its springing by the great vertical arches, which were carried through the thickness of the wall, rising outside to the top of the circular wall of the building. M. Chedanne went on to remark that the removal of some of the bricks from the main vault was facilitated by the cracks already existing there,

and it was not without astonishment that he noted that they were stamped with dies known to be of the time of Hadrian, and of the probable date of 123 A.D. The result of that discovery, which was by far the most important made by M. Chedanne, not only enabled him to decide that the whole of the rotunda was built by Hadrian, but led to a series of researches respecting the famous portico of Agrippa, respecting which M. Chedanne remarked that till within recent times it had always been looked upon as an addition made by Agrippa to shelter the statue of Augustus and his own, which the Emperor forbade him to place in the interior of the temple by the sides of those of the Cæsars. Its composition and plan was regarded as a confirmation of the writings of Dion Cassius, which formed nearly always the starting-point of studies relating to the Pantheon. On careful examination of the construction it was easy to see by the bond of the courses, the projection of cornices, the brick bonding courses, and the setting back of the exterior wall-surface of the circular wall, that the rotunda, with its brick projection and the portico were built at the same time. That which surprised him the most, however, was the absence of any suggestion as to the numerous defects which constituted the clearest proof that the existing portico was a reconstruction long posterior to the age of Augustus. M. Chedanne gave reasons for his hypothesis that the original portico of Agrippa was decastyle.

A vote of thanks was then passed to the French Government for loan of drawings and to M. Chedanne for explaining them. The prizes having been distributed the meeting adjourned.

Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

HALLAM ON THE PROGRESS OF DOMESTIC ARCHITECTURE.

THE qualities by which Henry Hallam was adapted to become a historian of an unique kind were of the judicial sort. As Macaulay said of him, "He sums up with a calm, steady impartiality, turning neither to the right nor to the left, glossing over nothing, exaggerating nothing." At the same time it must be admitted that he was "a hanging judge, the Page or Buller of the high court of literary justice." The remarks on the progress of Domestic architecture in Europe which we publish are as good a sample of Hallam's treatment as any of his investigations of constitutional or literary subjects. He gives the evidence on which he relies and does not attempt to exaggerate its value. He is also impartial in his conclusions. The supposition that Mediæval life was delightful, which was a consequence of the acceptance of Sir Walter Scott's descriptions in his poems and novels, is shown to be only the effect of imagination. But the doctrine of the progress of social life which only a few believed in is upheld. There have been many historians in England, but there is not one of them who attempted to write a summary of the history of architecture which is comparable with the following by Henry Hallam:—

No chapter in the history of national manners would illustrate so well if duly executed the progress of social life as that dedicated to Domestic architecture. The fashions of dress and of amusements are generally capricious and irreducible to rule, but every change in the dwellings of mankind, from the rudest wooden cabin to the stately mansion, has been dictated by some principle of convenience, neatness, comfort or magnificence. Yet this most interesting field of research has been less beaten by our antiquaries than others comparatively barren. I do not pretend to a complete knowledge of what has been written by these learned inquirers, but I can only name one book in which the civil architecture of our ancestors has been sketched, loosely indeed, but with a superior hand, and another in which it is partially noticed. I mean by the first a chapter in the appendix to Dr. Whitaker's "History of Whalley," and by the second Mr. King's Essays on Ancient Castles in the "Archæologia," vols. iv. and vi. Of these I shall proceed to make free use in the following paragraphs.

The most ancient buildings which we can trace in this island after the departure of the Romans were circular towers of no great size, whereof many remain in Scotland, erected either on a natural eminence or on an artificial mound of earth. Such are Conisborough Castle, in Yorkshire, and Castleton, in Derbyshire, built perhaps before the Conquest.* To the lower

chambers of those gloomy keeps there was no admission of light or air, except through long narrow loopholes and an aperture in the roof. Regular windows were made in the upper apartments. Were it not for the vast thickness of the walls, and some marks of attention both to convenience and decoration in these structures, we might be induced to consider them as rather intended for security during the transient inroad of an enemy than for a chieftain's usual residence. They bear a close resemblance, except by their circular form and more insulated situation, to the peels or square towers of three or four storeys which are still found contiguous to ancient mansion houses, themselves far more ancient, in the northern counties, and seem to have been designed for places of refuge.

In course of time the barons who owned these castles began to covet a more comfortable dwelling. The keep was either much enlarged or altogether relinquished as a place of residence except in time of siege, while more convenient apartments were sometimes erected in the tower of entrance over the great gateway which led to the inner ballium or courtyard. Thus at Tunbridge Castle, this part of which is referred by Mr. King to the beginning of the thirteenth century, there was a room, 28 feet by 16, on each side of the gateway; another above of the same dimensions, with an intermediate room over the entrance, and one large apartment on a second floor occupying the whole space and intended for state. The windows in this class of castles were still little better than loopholes on the basement storey, but in the upper rooms often large and beautifully ornamented, though always looking inwards to the court. Edward I. introduced a more splendid and convenient style of castles, containing many habitable towers with communicating apartments. Conway and Carnarvon will be familiar examples. The next innovation was the castle-palace, of which Windsor, if not quite the earliest, is the most magnificent instance. Alnwick, Naworth, Harewood, Spofforth, Kenilworth and Warwick were all built upon this scheme during the fourteenth century, but subsequent enlargements have rendered caution necessary to distinguish their original remains. "The odd mixture," says Mr. King, "of convenience and magnificence, which characterises designs for protection and defence, and with the inconveniences of the former confined plan of a close fortress, is very striking." The provisions for defence became now, however, little more than nugatory; large arched windows like those of cathedrals were introduced into halls, and this change in architecture manifestly bears witness to the cessation of baronial wars, and the increasing love of splendour in the reign of Edward III.

To these succeeded the castellated houses of the fifteenth century, such as Hurstmonceaux, in Sussex, Haddon Hall, in Derbyshire, and the older part of Knowle, in Kent.* They resembled fortified castles in their strong gateways, their turrets and battlements, to erect which a royal license was necessary, but their defensive strength could only have availed against a sudden affray or attempt at forcible dispossession. They were always built round one or two courtyards, the circumference of the first, when there were two, being occupied by the offices and servants' rooms, that of the second by the state apartments. Regular quadrangular houses, not castellated, were sometimes built during the same age, and under Henry VII. became universal in the superior style of Domestic architecture. The quadrangular form, as well from security and convenience as from imitation of conventual houses, which were always constructed upon that model, was generally preferred; even where the dwelling-house, as indeed was usual, only took up one side of the enclosure, and the remaining three contained the offices, stables and farm-buildings, with walls of communication. Several very old parsonages appear to have been built in this manner. It is, however, very difficult to discover any fragments of houses inhabited by the gentry before the reign, at soonest, of Edward III., or even to trace them by engravings in the older topographical works, not only from the dilapidations of time, but because very few considerable mansions had been erected by that class. A great part of England affords no stone fit for building, and the vast, though unfortunately not inexhaustible, resources of her oak forests were easily applied to less durable and magnificent structures. A frame of massive timber, independent of walls and resembling the inverted hull of a large ship, formed the skeleton, as it were, of an ancient hall; the principal beams springing from the ground naturally curved, and formed a Gothic arch overhead. The intervals of these were filled up with horizontal planks, but in the earlier buildings, at least in some districts, no part

a royal residence, which it certainly never was after the Conquest. But if the engravings of the decorative parts in *Archæologia* are not remarkably inaccurate the architecture is too elegant for the Danes, much more for the unconverted Saxons. Both these castles are enclosed by a court or ballium, with a fortified entrance, like those erected by the Normans.

* The ruins of Hurstmonceaux are, I believe, tolerably authentic remains of Henry VI.'s age, but a modern antiquary asserts that only one of the courts at Haddon Hall is of the fifteenth century.—Lysons's *Derbyshire*.

* Mr. Lysons refers Castleton to the age of William the Conqueror, but without giving any reasons. Mr. King had satisfied himself that it was built during the Heptarchy, and even before the conversion of the Saxons to Christianity, but in this he gave the reins, as usual, to his imagination, which as much exceeded his learning as the latter did his judgment. Conisborough should seem by the name to have been

of the walls was of stone. Stone houses are, however, mentioned as belonging to citizens of London, even in the reign of Henry II., and, though not often perhaps regularly-hewn stones, yet those scattered over the soil, or dug from flint quarries, bound together with a very strong and durable cement, were employed in the construction of manorial houses, especially in the western counties, and other parts where that material is easily procured.* Gradually, even in timber buildings, the intervals of the main beams, which now became perpendicular, not throwing off their curved springers till they reached a considerable height, were occupied by stone walls, or, where stone was expensive, by mortar or plaster, intersected by horizontal or diagonal beams, grooved into the principal piers. This mode of building continued for a long time, and is still familiar to our eyes in the older streets of the Metropolis and other towns, and in many parts of the country.† Early in the fourteenth century the art of building with brick, which had been lost since the Roman dominion, was introduced, probably from Flanders. Though several edifices of that age are constructed with this material, it did not come into general use till the reign of Henry VI. Many considerable houses, as well as public buildings, were erected with bricks during his reign and that of Edward IV., chiefly in the eastern counties, where the deficiency in stone was most experienced. Few, if any, brick mansion houses of the fifteenth century exist, except in a dilapidated state; but Queen's College and Clare Hall at Cambridge, and part of Eton College, are subsisting witnesses to the durability of the material as it was then employed.

It is an error to suppose that the English gentry were lodged in stately or even in well-sized houses. Generally speaking, their dwellings were almost as inferior to those of their descendants in capacity as they were in convenience. The usual arrangement consisted of an entrance-passage running through the house, with a hall on one side, a parlour beyond, and one or two chambers above, and on the opposite side a kitchen, pantry and other offices.‡ Such was the ordinary manor-house of the fifteenth and sixteenth centuries, as appears not only from the documents and engravings, but, as to the latter period, from the buildings themselves, sometimes, though not very frequently, occupied by families of consideration, more often converted into farmhouses or distinct tenements. Larger structures were erected by men of great estates during the reigns of Henry VI. and Edward IV., but very few can be traced higher; and such has been the effect of time, still more through the advance or decline of families and the progress of architectural improvement than the natural decay of these buildings, that I should conceive it difficult to name a house in England still inhabited by a gentleman, and not belonging to the order of castles, the principal apartments of which are older than the reign of Henry VII. The instances at least must be extremely few.§

France by no means appears to have made a greater progress than our own country in Domestic architecture. Except fortified castles, I do not find in the work of a very miscellaneous, but apparently diligent writer,|| any considerable dwellings mentioned before the reign of Charles VII., and very few of so early a date.¶ Jacques Cœur, a famous merchant,

* Harrison says that few of the houses of the commonalty, except here and there in the west country towns, were made of stone. This was about 1570.

† "The ancient manours and houses of our gentlemen," says Harrison, "are yet, and for the most part, of strong timber, in framing whereof our carpenters have been and are worthily preferred before those of like science among all other nations. Howbeit such as are lately builded are either of brick or hard stone, or both."

‡ In Strutt's *View of Manners* we have an inventory of furniture in the house of Mr. Richard Fermor, ancestor of the Earl of Pomfret, at Easton, in Northamptonshire, and another in that of Sir Adrian Foskew. Both these houses appear to have been of the dimensions and arrangement mentioned. And even in houses of a more ample extent, the bisection of the ground-plot by an entrance-passage was, I believe, universal, and is a proof of antiquity. Haddon Hall and Penshurst still display this ancient arrangement, which has been altered in some old houses. About the reign of James I., or perhaps a little sooner, architects began to perceive the additional grandeur of entering the great hall at once.

§ Single rooms, windows, doorways, &c., of an earlier date may perhaps not unfrequently be found; but such instances are always to be verified by their intrinsic evidence, not by the tradition of the place. The most remarkable fragment of early building which I have anywhere found mentioned is at a house in Berkshire, called Appleton, where there exists a sort of prodigy, an entrance-passage with circular arches in the Saxon style, which must probably be as old as the reign of Henry II. No other private house in England, as I conceive, can boast of such a monument of antiquity.—Lysons's *Berkshire*.

|| It is to be regretted that Le Grand d'Aussy never completed that part of his *Vie privée des Français* which was to have comprehended the history of civil architecture. Villaret has noticed its state about 1380.

¶ Chenonceaux, in Touraine, was built by a nephew of Chancellor Duprat; Gaillon, in the Department of Eure, by Cardinal Amboise;

unjustly persecuted by that prince, had a handsome house at Paris, as well as another at Beaumont-sur-Oise. It is obvious that the long calamities which France endured before the expulsion of the English must have retarded this eminent branch of national improvement.

Even in Italy, where from the size of her cities and social refinements of her inhabitants, greater elegance and splendour in building were justly to be expected, the Domestic architecture of the Middle Ages did not attain any perfection. In several towns the houses were covered with thatch, and suffered consequently from destructive fires. Costanzo, a Neapolitan historian near the end of the sixteenth century, remarks the change of manners that had occurred since the reign of Joanna II., 150 years before. The great families under the queen expended all their wealth on their retainers, and placed their chief pride in bringing them into the field. They were ill-lodged, not sumptuously clothed, nor luxurious in their tables. The house of Caracciolo, high steward of that princess, one of the most powerful subjects that ever existed, having fallen into the hands of persons incomparably below his station, had been enlarged by them, as insufficient for their accommodation. If such were the case in the city of Naples so late as the beginning of the fifteenth century, we may guess how mean were the habitations in less polished parts of Europe.

The two most essential improvements in architecture during this period, one of which had been missed by the sagacity of Greece and Rome, were chimneys and glass windows. Nothing apparently can be more simple than the former; yet the wisdom of ancient times had been content to let the smoke escape by an aperture in the centre of the roof; and a discovery, of which Vitruvius had not a glimpse, was made perhaps in this country by some forgotten semi-barbarian. About the middle of the fourteenth century the use of chimneys is distinctly mentioned in England and in Italy; but they are found in several of our castles which bear a much older date.* This country seems to have lost very early the art of making glass, which was preserved in France, whence artificers were brought into England to furnish the windows in some new churches in the seventh century. It is said that in the reign of Henry III. a few ecclesiastical buildings had glazed windows. Suger, however, a century before, had adorned his great work, the abbey of St. Denis, with windows not only glazed but painted, and I presume that other churches of the same class, both in France and England, especially after the lancet-shaped window had yielded to one of ampler dimensions, were generally decorated in a similar manner. Yet glass is said not to have been employed in the Domestic architecture of France before the fourteenth century, and its introduction into England was probably by no means earlier. Nor indeed did it come into general use during the period of the Middle Ages. Glazed windows were considered as movable furniture and probably bore a high price. When the Earls of Northumberland as late as the reign of Elizabeth left Alnwick Castle, the windows were taken out of their frames and carefully laid by.†

But if the Domestic buildings of the fifteenth century would not seem very spacious or convenient at present, far less would this luxurious generation be content with their internal accommodations. A gentleman's house containing three or four beds was extraordinarily well provided; few probably had more than two. The walls were commonly bare, without wainscot or even plaster, except that some great houses were furnished with hangings, and that perhaps hardly so soon as the reign of Edward IV. It is unnecessary to add that neither libraries of

both at the beginning of the sixteenth century. These are now considered, in their ruins, as among the most ancient houses in France. A work by Du Cerceau gives accurate engravings of thirty houses; but, with one or two exceptions, they seem all to have been built in the sixteenth century. Even in that age defence was naturally an object in constructing a French mansion house; and where defence is to be regarded, splendour and convenience must give way. The name of château was not retained without meaning.

* Beckman's *History of Inventions*, a work of very great research, cannot trace any explicit mention of chimneys beyond the writings of John Villani, wherein, however, they are not noticed as a new invention. Piers Plowman, a few years later than Villani, speaks of a "chambre with a chimney," in which rich men usually dined. But in the account-book of Bolton Abbey, under the year 1311, there is a charge "pro faciendo camino" in the rectory-house of Gargrave. This may, I think, have been only an iron stove or fire-pan, though Dr. W. without hesitation translates it a chimney. However, Mr. King, in his observations on ancient castles, *Archæologia*, and Mr. Strutt, describe chimneys in castles of a very old construction. That at Conisborough, in Yorkshire, is peculiarly worthy of attention, and carries back this important invention to a remote antiquity. Chimneys are still more modern in France; and seem, according to Paulmy, to have come into common use since the middle of the seventeenth century. "Jadis nos pères n'avoient qu'un unique chauffoir, qui étoit commun à toute une famille, et quelquefois à plusieurs," t. iii. p. 133. In another place, however, he says:—"Il paraît que les tuyaux de cheminées étoient déjà très en usage en France."

† Bishop Percy says, on the authority of Harrison, that glass was not commonly used in the reign of Henry VIII.

books nor pictures could have found a place among furniture. Silver plate was very rare and hardly used for the table. A few inventories of furniture that still remain exhibit a miserable deficiency.* And this was incomparably greater in private gentlemen's houses than among citizens, and especially foreign merchants. We have an inventory of the goods belonging to Contarini, a rich Venetian trader, at his house in St. Botolph's Lane, A.D. 1481. There appear to have been not less than ten beds, and glass windows are specially noticed as movable furniture. No mention, however, is made of chairs or looking-glasses.† If we compare this account, however trifling in our estimation, with a similar inventory of furniture in Skipton Castle, the great honour of the Earls of Cumberland, and among the most splendid mansions of the north, not at the same period—for I have not found any inventory of a nobleman's furniture so ancient—but in 1572, after almost a century of continual improvement, we shall be astonished at the inferior provision of the baronial residence. There were not more than seven or eight beds in this great castle, nor had any of the chambers either chairs, glasses or carpets.‡ It is in this sense, probably, that we must understand Æneas Sylvius, if he meant anything more than to express a traveller's discontent, when he declares that the kings of Scotland would rejoice to be as well lodged as the second class of citizens at Nuremberg.§ Few burghers of that town had mansions, I presume, equal to the palaces of Dunfermline or Stirling, but it is not unlikely that they were better furnished.

In the construction of farmhouses and cottages, especially the latter, there have probably been fewer changes, and those it would be more difficult to follow. No building of this class can be supposed to exist of the antiquity to which the present work is confined; and I do not know that we have any document as to the inferior architecture of England so valuable as one which M. de Paulmy has quoted for that of France, though perhaps more strictly applicable to Italy, an illuminated manuscript of the fourteenth century, being a translation of Crescentio's work on agriculture, illustrating the customs and, among other things, the habitations of the agricultural class. According to Paulmy, there is no other difference between an ancient and a modern farmhouse than arises from the introduction of tiled roofs. In the original work of Crescentio, a native of Bologna, who composed this treatise on rural affairs about the year 1300, an Italian farmhouse, when built, at least according to his plan, appears to have been commodious both in size and arrangement.|| Cottages in England seem to have generally consisted of a single room without division of storeys. Chimneys were unknown in such dwellings till the early part of Elizabeth's reign, when a very rapid and sensible improvement took place in the comforts of our yeomanry and cottagers.¶

* See some curious valuations of furniture and stock in trade at Colchester in 1296 and 1301. A carpenter's stock was valued at a shilling, and consisted of five tools. Other tradesmen were almost as poor; but a tanner's stock, if there is no mistake, was worth 9*l.* 7*s.* 10*d.*, more than ten times any other. Tanners were principal tradesmen, the chief part of dress being made of leather. A few silver cups and spoons are the only articles of plate; and as the former are valued but at one or two shillings, they had, I suppose, but a little silver on the rim.

† Nicholl's *Illustrations*. Among several interesting facts of the same class, we have another inventory of the goods of "John Port, late the king's servant," who died about 1524. He seems to have been a man of some consideration, and probably a merchant. The house consisted of a hall, parlour, buttery and kitchen with two chambers, and one smaller on the floor above; a napery or linen-room and three garrets, besides a shop, which was probably detached. There were five bedsteads in the house, and on the whole a great deal of furniture for those times, much more than I have seen in any other inventory. His plate is valued at 94*l.*, his jewels at 23*l.*, his funeral expenses come to 73*l.* 6*s.* 8*d.*

‡ A better notion of the accommodations usual in the rank immediately below may be collected from two inventories published by Strutt, one of Mr. Fermor's house at Easton, the other Sir Adrian Foscawe's. I have mentioned the size of these gentlemen's houses already. In the former the parlour had wainscot, a table and a few chairs; the chambers above had two best beds and there was one servant's bed; but the inferior servants had only mattresses on the floor. The best chambers had window-shutters and curtains. Mr. Fermor, being a merchant, was probably better supplied than the neighbouring gentry. His plate, however, consisted only of sixteen spoons and a few goblets and ale-pots. Sir Adrian Foscawe's opulence appears to have been greater; he had a service of silver plate and his parlour was furnished with hangings. This was in 1539. It is not to be imagined that a knight of the shire a hundred years before would have rivalled even this scanty provision of movables. These details, trifling as they may appear, are absolutely necessary in order to give an idea with some precision of a state of national wealth so totally different from the present.

§ "Cuperent tam egregie Scotorum reges quam mediocres Nurembergæ cives habitare." Æn. Sylv. apud Schmidt, *Hist. des Allemands*.

|| Crescentius, in *Commod. Rurali*. This old edition contains many coarse woodcuts, possibly taken from the illuminations which Paulmy found in his manuscript.

¶ Chimneys were not used in the farmhouses of Cheshire till within forty years of the publication of King's *Vale Royal*, 1636.

It must be remembered that I have introduced this disadvantageous representation of civil architecture as a proof of general poverty and backwardness in the refinements of life. Considered in its higher departments, that art is the principal boast of the Middle Ages. The common buildings, especially those of a public kind, were constructed with skill and attention to durability. The castellated style displays these qualities in greater perfection; the means are well adapted to their objects, and its imposing grandeur, though chiefly resulting, no doubt, from massiveness and historical association, sometimes indicates a degree of architectural genius in the conception. But the most remarkable works of this are the religious edifices erected in the twelfth and three following centuries. These structures, uniting sublimity in general composition with the beauties of variety and form, intricacy of parts, skilful, or at least fortunate, effects of shadow and light, and in some instances with extraordinary mechanical science, are naturally apt to lead those antiquaries who are most conversant with them into too partial estimates of the times wherein they were founded. They certainly are accustomed to behold the fairest side of the picture. It was the favourite and most honourable employment of ecclesiastical wealth to erect, to enlarge, to repair, to decorate cathedral and conventual churches. An immense capital must have been expended upon these buildings in England between the Conquest and the Reformation. And it is pleasing to observe how the seeds of genius, hidden as it were under the frost of that dreary winter, began to bud to the first sunshine of encouragement. In the darkest period of the Middle Ages, especially after the Scandinavian incursions into France and England, ecclesiastical architecture, though always far more advanced than any other art, bespoke the rudeness and poverty of the times. It began towards the latter part of the eleventh century, when tranquillity, at least as to former enemies, was restored, and some degree of learning reappeared, to assume a more noble appearance. The Anglo-Norman cathedrals were perhaps as much distinguished above other works of man in their own age as the more splendid edifices of a later period. The science manifested in them is not, however, very great; and their style, though by no means destitute of lesser beauties, is upon the whole an awkward imitation of Roman architecture, or perhaps more immediately of the Saracenic buildings in Spain and those of the lower Greek empire.* But about the middle of the twelfth century this manner began to give place to what is improperly denominated the Gothic architecture,† of which the Pointed arch, formed by the segments of two intersecting semicircles, struck from points equidistant from the centre of a common diameter, has been deemed the essential characteristic. We are not concerned at present to inquire whether this style originated in France or Germany, Italy or England, since it

The fire was in the midst of the house, against a hob of clay, and the oxen lived under the same roof.

* The Saracenic architecture was once conceived to have been the parent of the Gothic. But the Pointed arch does not occur, I believe, in any Moorish buildings; while the great mosque of Cordova, built in the eighth century, resembles, except by its superior beauty and magnificence, one of our oldest cathedrals—the nave of Gloucester, for example, or Durham. Even the vaulting is similar, and seems to indicate some imitation, though perhaps of a common model. Compare *Archæologia*, vol. xvii. plates 1 and 2, with Murphy's *Arabian Antiquities*, plate 5. The pillars, indeed, at Cordova are of the Corinthian order, perfectly executed, if we may trust the engraving, and the work, I presume, of Christian architects; while those of our Anglo-Norman cathedrals are generally an imitation of the Tuscan shaft, the builders not venturing to trust their roofs to a more slender support, though Corinthian foliage is common in the capitals, especially those of smaller ornamental columns. In fact, the Roman architecture is universally acknowledged to have produced what we call the Saxon or Norman; but it is remarkable that it should have been adopted, with no variation but that of the singular horseshoe arch, by the Moors of Spain. The Gothic, or Pointed arch, though very uncommon in the genuine Saracenic of Spain and the Levant, may be found in some prints from Eastern buildings, and is particularly striking in the façade of the great mosque at Lucknow, in Salt's designs for Lord Valentia's *Travels*. The Pointed arch buildings in the Holy Land have all been traced to the age of the Crusades. Some arches, if they deserve the name, that have been referred to this class are not Pointed by their construction, but rendered such by cutting off and hollowing the projections of horizontal stones.

† Gibbon has asserted, what might justify this appellation, that "the image of Theodoric's palace at Verona, still extant on a coin, represents the oldest and most authentic model of Gothic architecture." For this he refers to Maffei, *Verona Illustrata*, where we find an engraving, not indeed of a coin, but of a seal, the building represented on which is in a totally dissimilar style. The following passage in Cassiodorus, for which I am indebted to M. Ginguené, would be more to the purpose. "Quid dicamus columnarum junceam proceritatem? moles illas sublimissimas fabricarum quasi quibusdam erectis hastilibus contineri." These columns of reedy slenderness, so well described by "juncea proceritas," are said to be found in the cathedral of Monreale in Sicily, built in the eighth century. They are not, however, sufficient to justify the denomination of Gothic, which is usually confined to the Pointed arch style.

was certainly almost simultaneous in all these countries,* nor from what source it was derived, a question of no small difficulty. I would only venture to remark that whatever may be the origin of the Pointed arch, for which there is more than one mode of accounting, we must perceive a very Oriental character in the vast profusion of ornament, especially on the exterior surface, which is as distinguishing a mark of Gothic buildings as their arches, and contributes in an eminent degree both to their beauties and to their defects. This, indeed, is rather applicable to the later than the earlier stage of architecture, and rather to continental than English churches. Amiens is in a far more florid style than Salisbury, though a contemporary structure. The Gothic species of architecture is thought by some to have reached its perfection, considered as an object of taste, by the middle of the fourteenth century, or at least to have lost something of its excellence by the corresponding part of the next age, an effect of its early and rapid cultivation, since arts appear to have, like individuals, their natural progress and decay. Yet this seems, if true at all, only applicable to England, since the cathedrals of Cologne and Milan, perhaps the most distinguished monuments of this architecture, are both of the fifteenth century. The mechanical execution, at least, continued to improve, and is so far beyond the apparent intellectual powers of those times that some have ascribed the principal ecclesiastical structures to the fraternity of freemasons, depositaries of a concealed and traditionary science. There is, probably, some ground for this opinion; and the earlier archives of that mysterious association, if they existed, might illustrate the progress of Gothic architecture, and perhaps reveal its origin. The remarkable change into this new style that was almost contemporaneous in every part of Europe cannot be explained by any local circumstances, or the capricious taste of a single nation.†

THE PROPOSED SITE FOR CHRIST'S HOSPITAL AT HORSHAM.

THE Master of Marlborough College, as a member of the Council of Almoners of Christ's Hospital who supported the resolution passed last December to build the new Boys' School at Horsham, has published the following statement in answer to an article which appeared in the *Times* :—

Many letters and communications, most of them anonymous, have appeared during the last few months in the *Times* and other papers, condemning the policy of removing the school to the Horsham estate.

The advocates of this policy have hitherto not attempted to answer these criticisms, in spite of their frequent unfairness and inaccuracy, and so long as the removal to Horsham was still under discussion among the governing body there may have been sufficient reason for abstaining from an appeal to public opinion.

But the Council at their last meeting decided, *nem. con.*, to "place the building for the new Boys' School on the Horsham estate;" and on December 27 there appeared in the *Times*

* The famous Abbot Suger, Minister of Louis VI., rebuilt St. Denis about 1140. The cathedral of Laon is said to have been dedicated in 1114. I do not know in what style the latter of these churches is built, but the former is, or rather was, Gothic. Notre Dame at Paris was begun soon after the middle of the twelfth century, and completed under St. Louis. — *Mélanges tirés d'une grande bibliothèque*, t. xxxi. p. 108. In England, the earliest specimen I have seen of Pointed arches is in a print of St. Botolph's Priory at Colchester, said by Strutt to have been built in 1110. — *View of Manners*, vol. i. plate 30. These are apertures formed by excavating the space contained by the intersection of semicircular or Saxon arches, which are perpetually disposed, by way of ornament, on the outer as well as inner surface of old churches, so as to cut each other, and consequently to produce the figure of a Gothic church, and if there is no mistake in the date, they are probably among the most ancient of that style in Europe. Those at the church of St. Cross, near Winchester, are of the reign of Stephen; and, generally speaking, the Pointed style, especially in vaulting, the most important object in the construction of a building, is not considered older than Henry II. The nave of Canterbury Cathedral, of the erection of which by a French architect about 1176 we have a full account in Gervase, and the Temple Church, dedicated in 1183, are the most ancient English buildings altogether in the Gothic manner.

† The curious subject of freemasonry has unfortunately been treated only by panegyrists or calumniators, both equally mendacious. I do not wish to pry into the mysteries of the craft, but it would be interesting to know more of their history during the period when they were literally architects. They are charged by an Act of Parliament, 3 Henry VI., with fixing the price of their labour in their annual chapters, contrary to the statute of labourers, and such chapters are consequently prohibited. This is their first persecution; they have since undergone others, and are perhaps reserved for still more. It is remarkable that masons were never legally incorporated like other traders, their bond of union being stronger than any charter.

an article on this question, mainly based on the report of Mr. Rogers Field, which is quoted at great length.

The object of the article is plainly shown by the choice of passages from the report, and by the summary of objections at the end. The writer wishes to convince the public that the balance of evidence and argument is on the side of those "who have openly declared war against the utilisation of the site purchased by the Council of Almoners for Christ's Hospital at Horsham."

Plainly the time has now come when the policy of the Council should be publicly vindicated, else it may be supposed, even by their friends, that their decision is indefensible, or at least overborne by stronger arguments.

The objections to their decision are chiefly based on statements in Mr. Rogers Field's report, which are ingeniously marshalled in such a way as to imply that Mr. Field is absolutely hostile to the proposal to build at Horsham.

It will then be convenient to consider the real import of these statements, and to show that neither Mr. Field's report nor the other facts relating to the estate justify a verdict adverse to the decision of the Council.

Mr. Field's able and exhaustive report deals, as the *Times* article shows, with three main subjects :—

1. The Water-supply.—His careful investigation proved conclusively that the existing water-supply was insufficient for the needs of a large school. The Council, therefore, in accordance with his advice, have had a boring sunk at the point suggested by him to the depth of about 350 feet. This boring is not yet completed, but already it has produced a supply of water at the rate of forty gallons a minute, and an analysis of this water has proved that its quality is excellent in all respects.

But before this boring was commenced the Council had ascertained that, if it should fail to produce a sufficient supply of water, the waterworks of the town of Horsham would be fully able to supply the school with the excellent water there obtained from the lower strata of the Tunbridge Wells sand. All the quotations from Mr. Field's report about the water-supply which he investigated have, therefore, ceased to be relevant.

2. The second point dealt with by Mr. Field is the disposal of sewage from the school buildings. He makes suggestions which the Council would be prepared to adopt failing a still better plan which is under consideration.

In this part of the report reference is made to the "slight and occasional flooding of the lowest portion of the ground."

As this reference has furnished a weapon to objectors, it should be clearly understood that the spot in question is a small corner close to the river Arun, on the extreme edge of the estate, which consists in the main of "rising ground commanding wide and distant views" (see statement of the Council), or, as Dr. Kelly says, of "gentle slopes of large extent, freely exposed to the air and sun."

3. The Nature of the Soil.—Even a cursory examination of Mr. Field's report shows that he distinguishes between the "top soil" (to the depth of 2 feet or more, of which he gives no analysis or particulars) and the "subsoil," which is shown by analysis to be clay mingled with varying proportions of sand. This distinction is of primary importance in its bearing on the fitness of the estate for a school.

In the top soil, whatever be the cause (such as tillage, the work of earthworms, &c.), the sand appears to have come to the surface; at any rate the proportion of sand is very considerable. This top soil corresponds accurately to the account of it quoted by the Council from the report of Mr. J. W. Penfold, the surveyor employed by the Charity Commissioners. "It is a fairly light soil, working with a pair-horse plough." The present tenants are tilling it in this way, and during the whole of the Governors' tenancy a flock of from 300 to 400 breeding ewes has been kept without foot-rot or other maladies incidental to wet land.

Further, Mr. Aston Webb and Mr. Ingress Bell, when preparing for competition the designs ultimately chosen by the Council, considered very carefully the nature of the site selected for the buildings and playgrounds of the school. They were assisted in this by Mr. Henry Milner, who is an expert in such questions. They assured the building committee that they were well satisfied with the site, and that with shallow surface drainage of the part selected for the buildings and playgrounds, costing about 10*l.* an acre, the ground would be perfectly well suited for all the purposes of a large school.

Similar assurance is derived from the experience of a neighbouring landowner whose estate has been dealt with in this manner.

The article in the *Times* next dwells upon the report of Dr. Kelly, the Medical Officer of Health for West Sussex and Professor of Hygiene at King's College, London. And again by the choice of passages for quotation it deals with this report in such a way as to disguise or obscure the fact that it is distinctly and strongly in favour of the healthiness of the new site, particularly in regard to scarlatina and diphtheria, the diseases most dreaded by those who have charge of schools.

Dr. Kelly says:—"The facts I have collected over a long term of years relating to the health of persons dwelling on this area show that the rate of mortality is low and the incidence of disease moderate. I conclude, from a consideration of all the facts, that the estate is situated in a healthy spot, and that it is suitable, as explained above, for the purposes of a large school."

It remains to advert briefly to some other objections brought forward in the *Times* article and by other opponents.

(a) The distance from London (37 miles). The facts are as follows:—Before the site was purchased the London and Brighton Company agreed to construct a station on the estate, which is already traversed by their line to Portsmouth, and to convey third-class passengers to this station at a fare of 2s. 6d. for the return journey. This station, within three minutes' walk from the school buildings, would be reached in about 1¼ hours by passengers starting from Victoria or London Bridge. No expense for cabs or transport of luggage would be incurred on arrival.

It would not be easy to match an arrangement so convenient and economical as this; subject to the necessary condition that the school (which is entirely for boarders) should be removed completely away from the rapidly-growing circle of suburban London.

(b) The high price, "55,000*l.*," paid for the estate in spite of its "bleak situation and undeveloped character."

Those who are acquainted with the climatic conditions of some of the most flourishing public schools will simply smile at remarks about the bleakness of a site about 180 feet above the sea-level, and in the same latitude as Folkestone, Godalming and Taunton.

Those who speak of its undeveloped character ignore the fact that it is intersected by several good and well-planned private roads; that there are upon the Stammerham estate a good dwelling-house and twenty-seven substantial cottages, so situated as to be convenient for some of the many outdoor servants and workmen of a large school; and the central buildings of the Aylesbury Dairy Company, constructed at great cost, can be easily and inexpensively adapted for laundry, bakery stores, gymnasium, workshops and other necessary appliances of a school. And one admirable feature of the plans selected by the Council is that the architects have proposed so to utilise these buildings that a very considerable expenditure will be saved which on an "undeveloped" site would have been unavoidable.

These particulars apply to the Stammerham estate of 1,020 acres, purchased at a cost of 47,500*l.*—considerably less than was expended on buildings and improvements by the last owners.

Adjoining Stammerham the Council bought 70 acres of land, in which is the source of a spring that supplies the stream and lake in the grounds of Stammerham; there is also a large dwelling-house which can be turned to good account. This property was purchased for 5,500*l.*

If these facts are fairly considered, it will be found that the Council, in their purchase of the Horsham estate, have shown a due regard for economy.

Moreover, it is quite certain that, so soon as the school has been established on the estate, a demand will begin to arise for such portions of the 1,100 acres as may not be needed, and that the enhanced value of such land will go far to recoup the cost of the original purchase.

Lastly it must be borne in mind that the Council are not wantonly engaging in the enterprise of removing the school from London. They are appointed for the purpose of carrying into effect the provisions of a scheme framed by the Charity Commissioners, and approved by Parliament, in spite of several attempts to defeat it. Of this scheme the removal of the school from London is an essential feature.

EDINBURGH ARCHITECTURAL ASSOCIATION.

At the meeting of this Association a paper by the Rev. R. Scott Mylne, of London, author of "The Master Masons to the Crown of Scotland," was read on "The Architecture of Bologna and North-Eastern Italy." After glancing briefly at the history of the province of Bologna, Mr. Mylne said every traveller had heard of the leaning towers of the city of that name, and everyone went to see them. Nobody knew exactly why they were built, or what precise purpose they were intended to serve, and, although extremely curious, neither possessed architectural merit like the famous marble leaning tower of Pisa. The numerous arcades formed the most interesting architectural feature of the quaint Mediaeval town of Bologna. Marble being scarce in the district, terra-cotta was frequently used for decorative purposes with much taste and skill. The capacious font of the church of St. Marie dei Servi was one of the most remarkable examples of this kind. The long rows of slender marble columns formed an elegant kind of arcade, and in front of the western façade formed a charming little quadrangle. The actual beauty of effect, however, was somewhat

marred by the unfinished state of the main portion of the sacred edifice. In the church of St. Bartholomew there was also a very well designed portico carved in stone by Lombard sculptors in the sixteenth century, from the beautiful designs of Andrea de Formigine, executed A.D. 1530. In the same way many of the spacious residences of the old nobility presented magnificent specimens of Lombard and Renaissance architecture. The street fronts were often very noble, while the gateways, courtyards, staircases and colonnades provided capital examples of detailed design. The beautiful private residence of highest merit in the whole city was the Palazzo Bevilacqua. The façade to the main road was surmounted by a handsome cornice, and each separate stone in the wall was cut in the shape of a diamond with great care and of set purpose. On entering the courtyard the first impression was very pleasing; the symmetry was perfect, and the eye found repose in the gratified sense of true proportion. Delicacy and elegance of design, combined with due subordination of all the different portions of the entire structure, was the principal characteristic of this beautiful building. In the centre of the courtyard was a single ornament, a slender marble column supporting a finely-carved bear, from whose open mouth the whole establishment was supplied with pure water. In the great hall on the upper floor sufficient space was found to assemble the famous Council of Trent in A.D. 1547. Though there were other palaces in Bologna of larger dimensions than the Bevilacqua, and often possessing some particularly fine details, none as a whole excelled in merit that particular residence, which was a typical example of Bolognese skill. Was not the due sense of proportion there so well exhibited just the very thing so often lacking in many fine modern buildings? Some of the fine houses in Bologna were chiefly noticeable for the interesting capitals of the columns on their open arcades towards the streets. The oldest church of Bologna was St. Stephen, and consisted of seven churches of different dates united in one. More than a thousand years divided the most ancient and the most modern masonry, and everywhere archæological treasures abounded. But upon the whole St. Dominic was the most interesting church in the town, because it contained the marble shrine of the famous saint who founded the great monastic order of the Friars Preachers. As a work of art of the highest merit, Ruskin, Lord Lindsay, and other eminent writers devoted much space to a full description of these admirable sculptures. In the remaining part of his paper Mr. Mylne dealt with other great monuments of architecture in the north-eastern portion of Italy, more especially for purposes of comparison. The paper, which was read by Mr. Thomas Ross, was illustrated by a series of photographs. At the close the hearty thanks of the Association were awarded to Mr. Mylne, Mr. W. W. Robertson presided.

GENERAL.

Mr. Matthew Wallace, of the Albion Iron Company, was on Wednesday last sworn in as Justice of the Peace for the County of London, before Sir Peter Edlin, Q.C., at the Middlesex Sessions, Clerkenwell.

Mr. J. Cheaton Parr has given to the Corporation of Warrington a large hall he has had erected in the centre of the town. The hall has been built at a cost of over 6,000*l.*, and will seat nearly two thousand people.

The Surveyors' Institution meet on Monday the 21st inst., when a paper will be read by Mr. H. Blackburn, Fellow, on "The London Building Act, 1894."

The Members of the Police Fire Brigade, Wolverhampton, have resigned. A memorial, it is stated, was submitted to be put before the Watch Committee, but no information as to whether the Watch Committee was forthcoming, and it is considered that at the very least some reply should have been made to the men. Those who are daily prepared to risk their own lives for the public safety deserve better treatment.

The Llandudno Eisteddfod Committee having asked Mr. Ruskin to allow portions of his works to be translated in competition, Mr. Ruskin has acknowledged the implied compliment, but points out that he has always felt extremely indisposed towards translations from his works, and it would, perhaps, be hardly fair to persons to whom he has refused permission to translate into French and German if he were now to sanction translations into Welsh.

The Current Number of the *Quarterly* contains an article tracing the history and progress of the great Ordnance Survey. It is stated that the total cost of the survey, including the triangulation, primary, secondary and tertiary, levelling, surveying, drawing, engraving, publishing, and all necessary indexes, has been between 50*l.* and 51*l.* per square mile, or about 1*s.* 8*d.* an acre. This includes an enormous area of "town plans" on a scale of 1-500, which cost on the average from 1*s.* to 2*s.* per acre. It also includes the whole cost of the 1-inch topographical map and the smaller scales, with which the foreign cadastral surveys have had nothing whatever to do. The normal cost of the 1-2500 survey is about 1*s.* per acre.

The Architect.

THE WEEK.

It is with much regret we record the death at Lancaster, on Wednesday, of EDWARD GRAHAM PALEY, an architect whose reputation for ecclesiastical buildings had extended throughout England. The names of the firms of SHARPE & PALEY, PALEY & AUSTIN, and PALEY, AUSTIN & PALEY are intimately associated with the history of modern Gothic architecture. EDWARD GRAHAM PALEY, who was born in the Vicarage of Easingwold, near York, seventy-two years ago, belonged to a family that had gained reputation. His grandfather was the renowned Archdeacon PALEY, whose books hold their own amidst all the variations of the theories of theology and ethics. His brother, F. A. PALEY, was one of the best editors of Greek and Roman Classics that this century has seen, and was, moreover, a writer who helped to make Gothic popular, especially among religious people. EDWARD PALEY was placed as a pupil with the late EDMUND SHARPE, but beyond initiation into routine we doubt if he gained much. With all his versatility, which was amazing, Mr. SHARPE was not an artist, while EDWARD PALEY was so-endowed by nature. Many of his churches have the spirit of Mediæval times, and in the country often impart a charm to a landscape. The number of churches designed in the Lancaster offices was incredible. In that ancient town Mr. PALEY was a notability, and respected as a man who had added to its reputation. A testimony to his position was given when the Roman Catholics commissioned him to design their large church in Lancaster. He filled several public offices with advantage to the people, and although of late Mr. PALEY was not so often before the public as formerly, his loss will be deplored.

THANKS to the generous munificence of its sons, Paisley is becoming rich in public buildings which have great architectural merit. Among them the Clark Town Hall, the Public Library and Museum, the John Neilson Institution and the Thomas Coats Memorial Church stand out conspicuous. Other three large public buildings will soon be in the course of erection, all of them in the main gifts, namely, a new infirmary, a new grammar school and a technical college. The last mentioned has been promoted by the trustees of the late Mr. PETER BROUGH, who left the handsome fortune of 153,926*l.* for the good of Paisley. He gave instructions in his will that 300*l.* a year should be expended in establishing and maintaining a science lectureship, and this sum his trustees laid apart, adding to it yearly whatever was over of this income, after meeting the demands made upon them by the will itself and various educational, charitable and religious objects. In this way they have amassed 11,000*l.*, and a year or two ago the Messrs. J. & P. COATS handed over to them extensive dyeworks in George Street, the ground on which these are built, and 3,000*l.* Quite recently they also received 3,000*l.* from the directors of the present School of Design, so that now they are in possession of about 17,000*l.*, a free site, and buildings which, with slight alterations, can easily be adapted for the practical side of the teaching given in such institutions. Accordingly, they have called into existence a board of governors, to whom they have entrusted their funds and properties, and also the building and management of the new school. They are all members of the new Board, but in addition to them there are gentlemen who worthily represent the culture and industries of the town. Steps have been taken for reporting on the possibilities of the site granted by Messrs. COATS, and there will be no delay in forwarding the erection of this school, which will prove a great boon to the inhabitants of the thriving industrial town on the banks of the Cart.

THE decision given by Mr. LANE, Q.C., at the North London Police Court on Monday, is important because it recognises a difference between a mews and a street. There is no legal definition we believe of a mews in the

Building Acts. There is a clause, however, which refers to domestic buildings and stable buildings abutting on the rear upon mews, from which it might be inferred that the open space, rather than the combined space and stable buildings, is the mews. At any rate, although horses and carriages may pass along what is known as a mews in London it is hardly a public road or street. The County Council maintain the contrary and have tried to gain a decision in their favour. In an estate off the Green Lanes near Finsbury Park two streets were laid out to form two sides of a triangle, that is if prolonged, for there was no apex. The intervening space was to be utilised for mews. When application was made for authority to erect stables it was refused unless a road 40 feet wide could be made throughout, the effect of which would be that all the contemplated houses could not be erected, for there was no opening of that width allowed for. The builder continued his operations and was summoned. Mr. LANE in giving his decision said the space might for sanitary purposes be regarded as a street, but otherwise he considered it was no more a street than the place within a gentleman's gates which is used by tradesmen. The occupant of one of the stables would have no claim on any more of the enclosure than would be required for his horse or carriage to stand in. The summons was therefore dismissed.

THE Arthurian legends have gained fresh interest in our time, and if we need a symbolic representation of the trials of humanity in seeking after perfection, they will serve as well as the productions of the present race of poets in the Quartier Latin. It is questionable, however, whether too much has not been made of those which more immediately relate to the British King. The search after the Grail was a theme which demanded higher qualities in a narrator, and it is a pity it should be overshadowed by the domestic woes of a man who was incompetent to rule his wife. We are glad to find that the authorities of the public library of Boston, in their commission for paintings to Mr. E. A. ABBEY, have selected the older and more exalted series of subjects. Five of the pictures which are to illustrate *The Quest of the Holy Grail* are now to be seen in the Conduit Street Galleries. In spite of the defective lighting, it is evident that they are better than any work which Mr. ABBEY has hitherto produced in England. He has endeavoured to suggest genuine wall-painting on the canvas, and very successfully. The legend embodied was evidently the creation of ecclesiastics, and Sir GALAHAD is represented as a true son of the Church. A nun receives him as a baby from angel hands, and if he does not become a cleric it is not from the want of spiritual guides. We see him watching in the church before he receives his knighthood, and we see him with other knights receiving an episcopal blessing. But slight as was his contact with the secular world, GALAHAD was somehow affected by it, and accordingly he has not the grace which is necessary to rescue the Fisher King from his trance. The pictures are mystic and wonderful. It would be cruel to apply archæological tests to the architecture or the costumes. The selection of such a subject by Americans is remarkable, but probably it will be said that compensation is to be found in the Egyptian and Assyrian scenes which Mr. SARGENT painted and which puzzled visitors to the Royal Academy. Who knows whether we may not also see in time Greek and Buddhist legends depicted for the same building? Meanwhile we advise our readers to see Mr. ABBEY's pictures while the opportunity is afforded to them.

THE jury who will decide upon the most suitable plan for the projected Ghizeh Museum is definitely composed of the following members:—The Minister of Public Works as president, the members of the Egyptological Committee, the six Commissioners of the Public Debt; M. DAUMET, president of the Society of Architects in France; Mr. SOMERS CLARKE, architect; FRANZ PASHA, ex-architect-in-chief to the Wakfs Administration; and MANESCALCO BEY, architect-in-chief to the Egyptian Government. The four last-named will form the technical sub-committee to study and report upon the various plans. The competing plans are to be sent in not later than March 1.

SCOTTISH PORTRAITS AND LANDSCAPES.

THE exhibition which is now open at the Grafton Gallery will probably be considered to have more technical than general interest. It consists of a great many portraits by various painters, with some landscapes by the Rev. JOHN THOMSON. Few of the portraits represent people whose names are familiar to the average visitor to exhibitions. The landscapes are by a man who is rarely mentioned in books or articles about painting. But for students of art and archæology there is no doubt much to be found in the gallery which is worth attention, and moreover, as the pictures belong to private collections, the majority of them are as little known in Scotland as in England.

There are, for instance, fourteen works ascribed to GEORGE JAMESONE, the "Scottish VANDYKE," who flourished in the first half of the seventeenth century. In our opinion the most interesting among them is the *Earl of Moray*. This is a full length life-size figure and valuable as evidence of costume. The modern kilt was the invention of one of General WADE's army tailors, and did not form part of the garb of Old Gaul. The Earl of MORAY has the substitute which was long in use. A large scarf resembling a "maud" is twisted around him and is trussed up under a belt. The check is of such quiet colours it would not be accepted by English tourists as tartan. The works of ALLAN RAMSAY, who lived in the eighteenth century, are also deserving of notice. He was a favourite with Scottish gentlewomen, and he represented them and their costumes with a good deal of ability. He was fond of making them appear as rigid, but that was we suppose a sign of dignity and breeding. There are portraits by WILLIAM AIKMAN, GAVIN HAMILTON (one of whose paintings, No. 75, contains as odd a horse as ever appeared on canvas), DAVID MARTIN, W. ROBERTSON, St. CLAIR of Roslin, HERCULES SANDERS, D. SCOUGALL, &c.

Among the portraits those by RÆBURN are the most numerous (there are over eighty), and in execution they are the best. The occasional examples by him seen in the Winter Exhibitions of the Academy have been a surprise to many, for it seems strange that such a master should be so little known in England. RÆBURN is likely to be considered as ranking after REYNOLDS and GAINSBOROUGH; his countrymen will award him a higher position. Nature endowed him with the gifts that were requisite for a portraitist—an insight into character, a vigour of hand that could catch sudden expressions, sympathy with young and old, and the sound sense that would never allow a subject to be made ridiculous for the sake of a whim. Like so many of the Renaissance artists, he was for a time a goldsmith's apprentice, but out of love for painting he purchased his indentures. At first he practised in miniature, which seemed to be ill-adapted for a hand with RÆBURN's power. The works of REYNOLDS, which he was fortunate to behold, fascinated him, and he went off to Leicester Square as if an oracle was to be found there. The President was not jealous about a man between whose style and his own there was so much affinity. He allowed RÆBURN to work in his studio, advised him, and offered him money towards paying the cost of a residence in Rome. As the Scottish artist was not poor at the time he did not need any aid of the kind. RÆBURN lived for a couple of years in Italy. In 1787 he returned to Edinburgh to practise as a portraitist. He was then in his thirty-first year. The rest of his life was spent in Scotland. He died in 1823.

The esteem which REYNOLDS's works wrought in RÆBURN was abiding. The portraits in the Grafton Gallery suggest his indebtedness to the English artist. It must be observed, however, that RÆBURN was not a man who was ambitious to have his portraits taken for REYNOLDS's. He worked in as ample a manner, and we imagine that RÆBURN commonly employed much larger pencils than his idol. The handling is so bold one seems to be able to count the strokes. RÆBURN also avoided loading his colour. There are some portraits that seem to consist of the thinnest paints, and there is a general freedom from retouching. The *Mr. Wardrop* is a notable example. At the present time RÆBURN seems to be a better guide for students than REYNOLDS, at least on account of technique.

The subjects in the collection are varied, young and

old, men, women and children. We can only mention a few. In full-length figures RÆBURN was never stiff or stagey. *Sir Allan Macnab*, who was too old to appear with bare legs and with an absurd bonnet of undertaker's plumes, almost appeals for pity. *Captain Robert Hay* is depicted as a volunteer, and leans on his firelock without appearing as to the manner born. *Dr. Spens* is in action as an archer, and, although the Order of Foresters has made that sort of assumption ridiculous, RÆBURN's work is dignified. On the opposite wall is an earlier portrait of another archer by DAVID MARTIN, which sustains comparison with it. In all portraits which are supposed to be taken in the open air, RÆBURN is admirable in his backgrounds. They are not obtrusive, and yet they show no disrespect to nature. The *Mrs. Kinnear* appears seated leaning against a wall, and the grey of the masonry becomes a foil for the dress and face. In his indoor scenes he had no fear of red curtains or green curtains, but he avoids the stereotyped arrangement of them which was common at the time, and he is fond of repeating the colour on a chair. In the portrait of *Mrs. Stewart* there is a landscape as well as a red chair and a curtain, and all are well combined. *John Home*, the clergyman whose "My Name is Norval" has given him fame, although the tragedy no longer holds the stage, is shown in a green coat and is seated in a red chair. Some old gentlewomen wear soft Cashmere shawls of a creamy or yellow colour. *Colonel Lyon* is in a blue and white uniform sketching a scene, *Adam Rolland* is shown in a comfortable office with green curtains and chair, *John Tait* is represented showing his watch to his grandchild who plays with the seals, and the action appears as if it were accidental. The variety of colours which is found in the accessories of the portraits adds much to the interest of the whole if considered as works of art. The only cases which can be considered as partial failures are two examples of what are known as "fancy portraits." One is a dreamy youth, *William Ferguson*, which is unlike RÆBURN's works in style, and the other is a semi-nude boy in an awkward attitude.

Sir JOHN WATSON GORDON may be considered as the successor of RÆBURN. His portrait, *Professor John Wilson*, was taken at a time when "CHRISTOPHER NORTH" was crusty, but it expressed the power and beauty of a head that was worthy to be adopted as a model of JOVE himself. *James Hogg, the Ettrick Shepherd*, who was so often the pantaloons for WILSON's clowning, is characteristic of the shepherd and drover rather than of the laureate of fairydom. Near it are two remarkable representations of northern shrewdness, *Roderick Gray, Provost of Peterhead*, and *H. Houldsworth*. The portrait by S. GRAHAM-GILBERT of *James Hamilton*, once police commissioner of Glasgow, is as remarkable an example of characterisation as can be found in the Gallery. This Scottish FOUCHÉ might be playing a part in which vanity, cunning, persistency and mock modesty were needed. He is an unfathomable being, and yet one must feel that if he could be seen through the revelation would show only what was worthless. G. PAUL CHAMBERS was a prolific portrait painter, but unless he were in the right mood and satisfied with his sitter the result would not be gratifying. Two examples by him are in the Gallery. *Rachael* is not much better than a coloured photograph, but the *Rev. Dr. Anderson* is a capital work. CHAMBERS at his worst was, however, superior to WILLIAM DYCE, R.A., whose attempts are more to be deplored than those of the majority of incapable artists, for his method was a legacy to the Science and Art Department which is still working harm. HERDMAN's drawing of *Thomas Carlyle* in 1870 is one of the most vivid portraits of Mr. FROUDE's victim that has appeared. Sir D. MACNEE is represented by a portrait of *Mackay as Bailie Nicol Farvie*, which is so much superior to that painter's work we are almost disposed to doubt its authenticity.

Seventy years ago the Rev. JOHN THOMSON, who was parish minister of Duddingstone, near Edinburgh, was considered to be the most Scottish of the northern landscapists. Modern fiction has discovered interesting characters in the manses, but none of them surpasses THOMSON. He belonged to a clerical family, and his delight in painting and music was only a phase of his religious character, an expression of worship in another form, for he exemplified Mr. RUSKIN's maxim that all great

art is praise. He was reverential towards nature, especially as it was seen in the northern regions of Scotland, and he considered he was happy to be the means of recording its grandeur. THOMSON was persuaded to exhibit in Edinburgh, but he could not be induced to send any of his works to England. He was not solicitous of fame, and he felt that his neighbours and countrymen would alone be able to appreciate his aim when he combined painting with his ministerial office, as if the two were closely related. His aspirations were not unlike those of many of the old monks, but it would be ruin to him if he proposed to paint the walls of his church with Scripture scenes. THOMSON'S landscapes were not judged by rules that were applied to contemporary works. The exceptional favour which he enjoyed was owing to the belief that, like "Old Mortality," it was his mission to perpetuate things of which Scotsmen were proud. The references to his pictures in an imaginary conversation between CHRISTOPHER NORTH and JAMES HOGG (*Noctes Ambrosianæ*, No. xlviii.) is an instance:—

NORTH: Mr. Thomson, of Duddingstone, is now our greatest landscape painter. In what sullen skies he sometimes shrouds the solitary moors!

SHEPHERD: And wi' what blinks o' beauty he aften brings out frae beneath the clouds the spire o' some pastoral parish kirk, till you feel it is the Sabbath!

NORTH: Time and decay crumbling his castles seem to be warring against the very living rock—and we feel their endurance in their desolation.

SHEPHERD: I never look at his roarin' rivers wi' a' their precipices without thinking, some hoo or ither, o' Sir William Wallace! They seem to belong to an unconquerable country.

NORTH: Yes, James, he is a patriotic painter. Moor, mountain and glen—castle, hall and hut—all breathe sternly or sweetly o' auld Scotland. So do his seas and his firths—roll, roar, blacken and whiten with Caledonia—from the Mull of Galloway to Cape Wrath. Or when summer stillness is upon them, are not all the soft, shadowy, pastoral hills Scottish, that in their still deep transparency invert their summits in the transfiguring magic of the far sleeping main?

His pictures are now seen in the Grafton Gallery under conditions that he could not have anticipated, and will be judged by canons which were unknown to him. THOMSON felt he could not be too faithful to nature, and he endeavoured to represent not only form but the colours which sometimes seem to vary from moment to moment in the North. The view of *Loch Scavaig, Skye*, is one remarkable instance, for although the colours on the rocks now appear rather confused, it will be evident to every painter they once expressed much of the witchery of light and shade. Where as in that view, or in *Loch Cormirk, Skye*, and in many of the coast scenes THOMSON was satisfied with reality, he is always admirable. But where he fails is when he wishes to show his respect for a scene by endeavouring to elevate it in order to make it correspond with the examples of the ancient masters. He could have had few opportunities to study their works and probably was compelled to rely on engravings. It is in some of his foregrounds THOMSON reveals these influences upon him. He will draw a scene like *Castle Urquhart* with fidelity, but the effect of distance will be suggested by conventionalities that are out of keeping. To give effect he also introduces trees which would puzzle a northern forester, as in the pictures called *Dunure Castle* and *Innerwick Castle*. His *Stirling Castle* at first seems to be an Italian view, but after study one perceives that the greater part of it is true to nature. With his cliffs and rocky scenes we suppose THOMSON felt that conventions were out of place, as well as in his sombre *Martyrs' Tombs on the Moss of Lockinkett, Galloway*.

Fortunately the majority of the paintings do not appear to have any claims to relationship with the "great masters," the work of men who scorned to accept nature as it appeared. The castled crags are a revelation of the shrewdness with which geological catalogues were turned to account in Scotland. The view of *St. Abbs Head* recalls the report of CROMWELL, who said it was a place "where ten men to hinder are better than forty to make their way." The castles were sufficiently impregnable to allow less than ten men to withstand forty. *Innerwick Castle* does not suggest a great fortress, but a handful of faithful retainers in it withstood a siege. We are told "they were honoured with an assault with large cannon, while hagbutters were placed so as to prevent the defenders from appearing at the windows." *Tantallon Castle* is the subject of two of THOMSON'S paint-

ings. As it was a stronghold of the DOUGLASSES, it was supposed to be unapproachable, and the utmost absurdity was suggested by the old proverb—

Ding down Tantallon—
Make a brig to the Bass.

From the land side it appears of little account, but seen from the sea it is among the most majestic of ruins, and, as THOMSON suggests, is not unworthy of the promontory on which it was erected, or of the fine coast of which it appears to form the defence. THOMSON also made a couple of paintings of *Fast Castle*, and although the colours have suffered the views bear out SCOTT'S words when he said, "Fast Castle is more like the nest of some gigantic roc or condor than a dwelling for human creatures." It is sometimes supposed that *Fast Castle* was the residence of RAVENSWOOD, and the scene of many of the incidents in the "Bride of Lammermoor." SCOTT, in his sly way, neither admits nor denies the truth of the statement, saying, "The author is not competent to judge of the resemblance betwixt the real and imaginary scene, having never seen *Fast Castle* except from the sea. But fortalices of this description are found occupying, like ospreys' nests, projecting rocks or promontories in many parts of the eastern coast of Scotland, and the position of *Fast Castle* seems certainly to resemble that of *Wolf's Crag* as much as any other, while its vicinity to the mountain ridge of *Lammermoor* renders the assimilation a probable one."

We must not linger over the associations which are excited by the representations of Conway, Ravensheugh, Kilbaun, Eclandonan, &c., when seen in a strange land. For architects they have more attraction than for ordinary visitors, for most of those lofty and inhospitable residences are in keeping with their sites, and justify the lines which JAMES ALVES wrote in the last century:—

Our barren rocks which English wits detest,
And make the butt of many a clumsy jest,
By Art transformed they shape the full sublime,
And strength and grandeur to convenience join;
Defy for ages Time's corroding rust,
When mould'ring bricks are mingled with the dust.

THOMSON is never more successful than when he suggests the relationship between the fortalice and the cliff. When, as in *Conway Castle*, he depicts the building alone he becomes prosy.

From the castles to the cases in the Gallery is only a rational transition. They display weapons of defence, plate, trophies and historical curiosities. There are examples of several varieties of the old Scottish broadsword, which are as picturesque as effective, skians and targets, the last showing generally an arrangement of the studs which was derived from old Celtic forms. The jewellery is, on the whole, inferior to what is made in Birmingham and sold to tourists as native work, but the silver plate, with the exception of the cups for church use, is fine in form and in ornament. There is one silver tankard with repoussé work which will probably excite more longing than any picture on the walls. In these days of revivals the "tirling-pin" seen in one of the cases might be worth utilising. It was a substitute for a door-knocker. It consisted of a notched bar over which a ring was quickly passed to serve as a summons when a door was about to be opened. A specimen of another piece of ironwork which we hope will always be obsolete—the thumbscrews—can also be observed, with many other things which were necessary for use in peace and war in Scotland.

THE END OF THE RENAISSANCE.—II.*

THE knowledge which enabled a multitude of Italians to paint, carve and design with facility had also its counterpart in architecture during the sixteenth century. The former kind was circulated, as it were, by the direct agency of man, just as the scholastic knowledge in the Mediaeval universities or the principles of the common law in England. The Renaissance treatises on painting and sculpture are not precise. DA VINCI'S, which is the best,

* *Histoire de l'Art pendant la Renaissance*. Par Eugène Müntz, Membre de l'Institut, Conservateur des Collections de l'Ecole Nationale des Beaux-Arts. III. Italie: La Fin de la Renaissance. Paris: Hachette et Cie.

was probably found to be as difficult for utilisation by his contemporaries as it is in our time. With all the facilities which we possess for exemplifying the various stages of a picture or a piece of sculpture, it may be doubted whether a treatise that can be called practical on painting or sculpture is feasible. A master will find that his lessons are only appreciated when exemplified with the aid of a pencil or a tool. The forms are too varied, the lines too subtle, to be defined in a printed page. With architecture, on the contrary, in which right lines and unvarying geometric figures are elements, the written or printed treatise can almost supersede oral discourses. The laws of the art appeal to the intellect as well as to the eye, and are not to be understood without a concentration of attention for a longer or a shorter time, according to the capacity of the student.

In the sixteenth century men were able to hear about new buildings equally with new pictures or new statues, but the architects did not depend on the knowledge communicated by itinerant critics. Treatises on the art were at their disposal. The period we are considering was differentiated from those preceding it by the publication of the books of SERLIO, VIGNOLA and PALLADIO, which went beyond ALBERTI'S "De Re Ædificatoria" in conveying information that could be turned to account without much labour. The effect of the books was to create a standard of art, for in the sixteenth century every author was esteemed, and to put a check on license. Architects had also in Rome antique buildings which received as much reverence as if they came from superhuman hands. Thanks to antiquity and the printing press, the art of architecture was more free from extravagance in the sixteenth century than the other arts. M. EUGENE MÜNTZ is therefore able to commence the part devoted to architecture in his volume by saying, "It is impossible to deny that it was in the region of architecture the grandest works were accomplished in the end of the Renaissance. While sculpture and painting became more and more frivolous, architecture became more learned and serious." The sobriety of style is the more remarkable when we consider the temptations of the time and the absence of uniformity and training among the architects. On the latter subject M. MÜNTZ writes:

It will not be uninteresting to consider the origin of the great architects belonging to the last period of the Renaissance. Peruzzi, Giulio Romano, Serlio, Vignola, Vasari, Buontalenti, P. Tibaldi commenced as painters; Michel Angelo, Sansovino, Ammanati, as sculptors; Antonio San Gallo, San Micheli, Alessi and Palladio were devoted to the art of building from their youth. As happened at an earlier time, some of the architects were likewise contractors. For example, Battista da San Gallo and Giovanni Mangone were employed by the Papal Court as examiners of the work of other men, and contractors on their own account. Vasari, on the other hand, delegated the duty of directing the construction of the buildings he designed to subalterns, to a certain Master Bernard in particular. The architect was considered as legally responsible for failures. After the fall of the vaulting of the Library of St. Mark, Sansovino was imprisoned and fined 1,000 golden marks. It was with much difficulty he was able to explain his innocence, and to obtain the repayment of the sums which were wrung from him.

For the first time in the Renaissance architecture was not considered merely as an affair of single buildings. Attempts were made to improve the streets in which they stood. In Genoa it appears the people of a district united in order to insure that the axis of the Strada Nuova should be laid out in such a way as to afford pleasing views, an example that could be followed with advantage in our time. In regarding buildings as if they were only units and of diminished value unless in combination, more modesty of character for single buildings would be insured. The employment of wooden models instead of drawings was a means to the same end. The author of "Henry IV. Part II." recommends the use of models in order to save building owners from going beyond their means, but they were no less useful in putting a check on redundancy of ornamentation. They were included among the works which an architect could take up without loss of caste. In Florence M. MÜNTZ tells us not only JEAN BOLOGNE, BUONTALENTI and DOSIO were occupied with them, but one of the Medicean princes did not disdain to fashion a model. LABACCO was paid 5,184 golden crowns (over 7,000*l.*) for one representing SAN GALLO'S design for St. Peter's; MICHEL ANGELO'S was suggested by one of clay costing only

25 crowns, and it gained the commission. The employment of marbles was also conducive to sobriety of treatment.

The architects of the time would not be men if they did not commit errors. MICHEL ANGELO, who might be supposed to care only for fine sweeping lines, introduced the broken pediments, which the Dutchmen ought to have acknowledged by a statue at least. There were many other puerilities to be debited to him, and they justify M. CHARLES GARNIER in saying the Florentine was not familiar with the grammar of the art, and Mr. FERGUSSON when he calls attention to "those unconstructive absurdities which disfigure all the buildings of that great man." M. EUGENE MÜNTZ is more temperate in his criticism. He does not deny that MICHEL ANGELO was indifferent to repose, that the right line was odious to him and was eventually broken, and that the calmness and purity of the old style of Florentine façades were disturbed by his pilasters, niches and festoons; but he maintains that the artist's errors were often advantageous, as they were the means of introducing new ideas, besides leading to the creation of works of the value of the chapel of the MEDICIS and the dome of St. Peter's. It is unquestionable that much modern work is more allied to MICHEL ANGELO'S attempts than to the work of any of the other Renaissance architects. The efforts to avoid monotony, even at the cost of sacrificing qualities which impart repose to a building, may claim to have had his inspiration. It was only natural that a man who had devoted so much of his life to the study of the human form, and who was cognisant of the extraordinary variety of contours which are to be found in all parts of the body, should be incapable to realise that the tradition of architecture was in favour of masses expressive of their inertia as approaching the nearest to the ideal of art.

M. MÜNTZ, with all his admiration for MICHEL ANGELO, places PERUZZI above him as an architect. But the modesty or timidity of the man was an obstacle to his attainment of the practice he merited. In the sixteenth as in the nineteenth century it was requisite for an architect to be mindful of his own interests. VASARI, who was acquainted with all the conditions of practice, warns his readers against an imitation of PERUZZI'S conduct. He was employed by popes, cardinals and princes without much advantage to himself, for, says VASARI, "constant dunning is sometimes a virtue, to be lenient with some clients is an error." When he was dying his patrons felt remorse and promises were made to him, but it was too late. According to VASARI there never was an equal to PERUZZI in architecture, and his Farnesina "should rather be described as a thing born than as one merely built." The Massimi Palace was designed by him, but he directed no more than the lower part of the works. We can see that he thought of a building as a whole, and, however attentive to details, he never allowed them to interfere with the general effect. M. MÜNTZ calls him "le dernier harmoniste à la façon de BRAMANTE," and the phrase epitomises PERUZZI'S character as an architect.

Another famous artist of the century was ANDREA PALLADIO, the last of a grand race. He has given a name to a style, and indeed to many all Renaissance Italian is only Palladian under various shapes. Yet PALLADIO was not the name of the architect's family, and it is no longer possible to say what his surname should have been. He was only a poor stonecutter, the son of a miller, and it has yet to be discovered when he was born and in what quarter of Vicenza. Concerning his works M. MÜNTZ writes:—

The churches constructed by Palladio, in Venice (San Giorgio Maggiore commenced in 1560, the façade of San Francesco alla Vigna, 1568, il Redentore, 1570), were a veritable revolution. In doubling or tripling the proportions of certain factors, in making columns or pilasters of the same height as the entire façade (as had been done by Alberti in the church of St. Andrew, Mantua), he united simplicity to grandeur. His ideal was to conciliate the forms of antique temples with the requirements of Christian worship. Not less original is the cloister of Santa Giustina, at Padua. All is united rigorously; the influence of a firm will is seen in the least details. It is, however, in his native city, Vicenza, that the great artist has left his masterpieces. The construction of the Basilica, the Olympic Theatre, the "loggia del Delegato," the Rotunda, besides innumerable palaces and country villas, make it one of the most attractive in Italy. In the Basilica, where he had to consolidate the exterior of an old Gothic edifice, and to give it a façade in harmony with the taste of the Renaissance, he realised a double "tour de force" in accommodation and in decora-

tion. He demonstrated that in order to innovate it suffices to combine in a different manner engaged columns, coupled columns, arches, balustrades, statues and the other elements employed during a century and a half. In that way he succeeded in attaining an extreme variety and a great boldness of combinations; lines that were pure and yet animated; forms that were ample without being heavy. The Olympic Theatre is a mirage—Paul Veronese in architecture, through its profusion of statues on the columns and in the niches, its bas-reliefs and astonishing perspectives, its grandiose portals as in the modern boulevards, the general lines being, however, noble and calm.

From what we have said the character of the concluding volume of the history of the Italian Renaissance can be inferred. M. EUGENE MÜNTZ makes it clear that styles are connected with the idiosyncrasies of artists, and therefore a history of art must have a biographical basis. All the fine arts are treated in an uniform manner, and the abundance of beautiful and most exact illustrations will be found to be fitting auxiliaries to the descriptions. His success in dealing with the Italian division is a guarantee that the forthcoming volumes on the Renaissance in France, Germany and England will be no less satisfactory.

MANCHESTER ACADEMY OF FINE ARTS.

THE annual meeting of members of the Manchester Academy was held on Monday. The report stated that an experiment was tried last year to establish a plan of including as part of the business of the annual meeting the election to full membership from the body of the associates, believing that by such a change they might more certainly rely upon having a goodly muster. However, the Council upon this occasion reverted to the original custom, and the work of the ladies and gentlemen whose names were to be submitted for consideration might be fairly seen and discussed during the present week in the exhibition. A general meeting would be held next Monday to receive and examine voting papers, when the result of the investigations would be declared and the names of the successful candidates duly published. Respecting the last spring exhibition, the Council were pleased to be able to report that it was an entire success. Forty-five works found purchasers at a net price of 724*l.* 1*s.*, as compared with 457*l.* for thirty-four works sold in the spring exhibition of 1893. With regard to the work of the life classes during the session 1893-94, studies were submitted from eighteen ladies, whilst but two gentlemen students sent in work for inspection. The specimens as a whole were not of a highly satisfactory character, being considered as rather too slight and not displaying that spirit of earnestness necessary to the achievement of great things in art and study. The only awards granted were as follows:—To Miss Lucy Bowker and Miss Amy Howarth a free studentship for the sessions 1894-95 and 1895-96, and to Miss Mary Davis for the session 1894-95. Regret was expressed that at the exhibition last October many of the Society's leading and popular members failed to send in contributions. The Council believed that had more loyalty been displayed they would have now been able to record a much more satisfactory result. The Academy life classes for the present session opened on October 1, 1894, with four gentlemen and twenty-eight lady students, most of whom were re-elected from last session. Since the opening date the ladies' life class had been considerably augmented, the total number of students being now forty-four. In conclusion reference was made to the loss which the Academy had sustained by the death of Mr. J. Murgatroyd and Mr. W. P. Norris, two gentlemen who had always taken a keen interest in art matters. Two resignations were recorded, Mr. Basil Bradley and Mr. E. Salomons. The register showed at present forty-two members, thirty-six associates, forty-four students and eleven honorary members and sixty-eight annual subscribers. The statement of accounts presented by the honorary treasurer showed a balance of 135*l.* The officers were re-elected as follows:—President, Mr. H. C. Whaite; vice-president, Mr. R. Barber; treasurer, Mr. W. Artingstall; hon. secretary, Mr. Elias Bancroft; hon. literary secretary, Mr. W. Herbert Johnston. The Council was composed as under:—Mr. J. Houghton Hague, Mr. John Cassidy, Miss M. F. Monkhouse, Miss E. Magnus and Mr. J. H. Davis Colley.

LORD HOUGHTON ON ART IN IRELAND.

THE prizes won by the students of the Dublin School of Art were distributed by the Lord Lieutenant. His Excellency said:—The report which I hold in my hand, particularly read in the light of the interesting speeches of Dr. Ball, the director of the Science and Art Museum, and Mr. Brennan, is one, I think, of which the teachers and the students may well be proud. I see it stated in the report that prizes in the national awards are yearly becoming more difficult to win owing to increased competition, and that, therefore,

they do not consider that the school has done otherwise than well. Well, that is a very fair statement to make in the interests of the school, and although the fact may press sometimes hardly on individuals, it is one that we cannot speak of with regret, because it shows that the general standard all over the country is a higher one than it was before. And before proceeding to speak on what I may call the more picturesque part of the work of the school I would like for one moment to refer to the classes for science and geometry, which, I see, have sustained a sad loss, for although these subjects are not so generally attractive, for that very reason I think attention ought to be drawn to the useful part that is played by instruction of that kind in the education of the country. As regards the more purely artistic side of art study, I think that we must all agree that the school is to be congratulated on the general measure of success it has obtained. And I most heartily agree with what fell from Dr. Ball, that the object of this school is not to produce one or two brilliant geniuses, although I am not by any means sure that it does not do so now and then, but that the object is to sustain a high level of general work which will enable the students to lead useful lives in any branch of artistic study that they may afterwards undertake. And I think that there is no more gratifying feature in the whole report than that to which attention has been already drawn, namely, that of the association of this School of Art with the improvement of the products of Irish industry, such as lace, and also in other branches. I notice with very great pleasure the successes which have been gained under the wing of the Royal Dublin Society and with the Irish Industries Association at that very successful local exhibition which was held in Kirkby Lonsdale, in Westmorland, and in which I may say I take a personal interest. If, as I believe is likely to be the case, an Art and Crafts Exhibition is held in Dublin, that will, I trust, give a still further impetus in that direction, because I think, whatever our views on the art of the present day may be, we must all agree that there is a great deal to be done in the direction of improving the form of many articles of common use. This we know is an age of wholesale production, and I think that the life of a school of this kind ought to be one of perpetual struggling against mechanical reproduction. The reproduction, the endless reproduction, of even good designs is bad enough, but when it comes to the reproduction of unmeaning or even actually bad designs by hundreds and thousands, that is a thing against which schools of this kind ought to maintain a perpetual struggle. What is desirable is to restore to articles of everyday use some stamp of the individuality of our artists, which is what makes so precious to us the work of artists of the old days, even when humble materials were used for objects of everyday use. It is only by such means as these that the general standard of taste is to be raised. That it is being raised I think may fairly be deduced from what Dr. Ball told us of the use that is made of the museum of which he is also director. His figures appear to me to be exceedingly striking. And even, as he humorously pointed out, if some deduction is to be made for the presence of tourists, I do not know that we have any reason to complain. A certain depreciation, as we all know, attaches to the word "tourist;" I am not quite sure why, for tourists are human beings, and we have many of us been tourists ourselves. And if they had come, a certain number, on cars or otherwise, to view the museums, I do not know why anybody should complain. But I think it is very evident from what Dr. Ball said that the casual visitors form but a very small part of those who visit that most interesting collection. And before leaving this branch of the subject I may say with what pleasure I heard the figures that he gave describing the use which is made of that museum on Sunday. I am one of those who believe that the admission of persons interested in art to the great collections on Sunday, under proper restrictions, is a distinct assistance instead of being a bar to proper and reverent use of the day. Well, I said that the object of this school is to raise the general standard of taste. And it has sometimes occurred to me, as it may to you, to ask, what is "taste?" There is no known code that may be laid down at any given moment to say what taste is. The taste of one age is not the taste of another. I think that it can only be described as the best opinion on matters of art of the best minds of the age in which we live. No doubt there are some points on which most ages have been agreed. Most ages have been agreed, for instance, that the Parthenon, Salisbury Cathedral, and the Campanile in Florence are fine buildings. But in other matters which seem to us as easy of decision as these, the divergence of taste, as we know, has been exceedingly wide. To some it is disheartening that at certain periods of history the artistic sense seems to have died down altogether. There was a period in the present century when a sort of wave of ugliness seemed to pass over the country, of ugliness in architecture, ugliness in furniture and ugliness in dress, the delivery from which will be always inseparably associated with the name of Mr. Ruskin. There have been periods, I say, of what we consider bad taste, and perhaps there may be again,

but I think that the duty of the student is a simple one enough. The duty of the student is to look to the best minds, as I have said, of his own day, but he is never to forget at the same time that he has a mind of his own. The ideal student to my mind should exhibit a proper mixture of the two opposing but not incompatible qualities of reverence and independence. Unless he has reverence both for the great minds of the past and the great minds of the day more approaching to his own, he is never likely to become an artist in any branch. But, if he carries his reverence to such an extent as to sacrifice his individual independence of mind, he will become and remain a mere slavish copyist. In this school you are all engaged in one form or another in the discovery of what is beautiful, and in learning to know in what way to turn that knowledge to account. As for the spirit in which that search is best made, I think I may well express what I mean by quoting the words of a fine critic and writer who has lately been taken from us. He says:—"The more we reflect, the more we are led to the conviction that art cannot neglect correspondence between beauty and truth, beauty and goodness, and beauty and use." And I would particularly draw your attention to the word "use." In proportion as beauty includes these elements, it is vigorous, enduring, vital and universal for all time and for all nations. I thank you very heartily for your kindness in passing this vote of thanks.

THE LATE SIR CHARLES NEWTON.

ON Wednesday a meeting of the Hellenic Society was held when Professor Jebb, M.P., the president, spoke upon the services of the late Sir Charles Newton.

Professor Jebb said that at the first general meeting of the Society which had been held since the death of Sir Charles Newton, it was fitting that some tribute should be rendered to the memory of one whom the Hellenic Society might justly regard as chief among its founders; whose presence and influence did more than anything else to carry it successfully through the earliest days of its existence, and who, to the end of his life, took the keenest interest in its growing prosperity. Newton's life divided itself into three well-marked chapters. The first contained the thirty-six years from his birth in 1816 to 1852; it was the period of preparative studies. The second began in 1852 with his consulship at Mitylene, and closed in 1861 with his return to London as the head of his department at the British Museum; it comprised the period of travel and discovery in the Levant. In the third chapter, from 1861 onwards, he was the organiser and administrator; the recognised head of classical archaeology in this country; the active supporter of all enterprises, whether originating at home or abroad, which could extend the knowledge of antiquity, or which promised to advance an object always so near to his heart, the addition of new treasures to our great national collection. After sketching the chief events of Sir Charles Newton's life, the works he wrote and his achievements in exploration, Professor Jebb went on to deal with Sir Charles's connection with the Hellenic Society. He said:—"When the inaugural meeting of this Society was held in June, 1879, it was to him that the supporters of the project primarily turned for countenance and counsel. During the first six years of the Society's life he was constantly in the chair at our meetings; nor is it too much to say that his guidance and his name must be reckoned among the chief causes, not only of the early and rapid success which attended the Hellenic Society, but also of the position in which it is now established. In 1883 his aid and counsel were also valuable in helping to institute that British School at Athens which, in the face of difficulties not experienced by the similar schools of other nations, has done so much to uphold the reputation of our country in the field of archaeological research. This is merely a bare outline of Newton's life-work; but even so slight a sketch must not close without some attempt to indicate the leading characteristics of the man's mind and nature. First, as to his attitude towards his chosen studies. It has lately been said, by one well fitted to judge, that the ancient monuments interested Newton rather on the historical side than on the mythological or the artistic. Indeed his own words can be quoted, "I am first an historian, and secondly an archaeologist." This may seem a hard saying, but I believe that it is true, though it perhaps needs some elucidation. It means that Newton was never a specialist in the limited modern sense; it was classical antiquity as a whole that had a spell for him; it was in the intense desire to reconstruct and revivify this antiquity that he so closely and indefatigably scanned every monument of any kind that could tell him anything about it. His strongest feeling in early manhood was that ancient literature, in which he was well versed, told only part of the story. His address at Oxford in 1850—which now stands first in his volume of essays—begins with words which strike the keynote of his work, "The record of the human past is not all contained in printed books."

Hence the peculiar interest which he always took in epigraphy; here he felt that he came closest to ancient lives and minds; his two essays on Greek inscriptions, published in 1876 and 1878 (the fourth and fifth of the collected essays), illustrate this in full; few productions of his pen are more striking. Now, this desire to apprehend the life of antiquity is often associated with the kind of imagination which seeks vivid or rhetorical utterance in language; it was distinctive of Newton that, in his case, there was absolutely no such tendency; on the contrary, he recoiled from it. The life of his imagination was an inward life—so inward that he might often seem unimaginative; a life which he wished to share only with the careful, laborious, exact student, but did not choose to share with the outward world. Witness the guides which he prepared to his galleries at the British Museum—exemplifying his conception of a scientific catalogue as the outcome of a life devoted to a single study—but making no concession to a popular desire for more elementary knowledge. When, in 1880, he became the first Professor of Archaeology at University College, London, the stamp of his teaching showed the same bent. His sustained, though undemonstrative, ardour was singularly allied with caution. Without being cynical, he was wary in a degree which sometimes approached to cynicism; in discriminating between what was merely probable, and what might be accounted certain, he leaned to the sceptical side, and he was imbued with the sentiment which Aristotle attributes to old age, that "most things are unsatisfactory." No man was less sanguine, or quicker to foresee the difficulties of a project; but, once engaged in it, he was tenacious and intrepid. His self-contained manner was due in part to the natural fastidiousness of his taste; it was only when he felt secure, for the time, against jarring incidents—which, even when slight, affected him like physical pain—that he completely unbent, and showed the most genial side of his nature. In colleagues he looked for the highest standard of work; his demands on subordinates were strict; he was an exacting, but also a stimulating, ruler. If the essence of his character could be contained in a phrase, it might perhaps be described as severe enthusiasm. To those who knew him but slightly, the severity—not harshness, but the severity as of good Greek sculpture—might be more evident than the enthusiasm; but a nearer knowledge revealed the man in whom an inward fire had burned steadily from youth upwards—a sacred fire, little seen, not to be extinguished, and shaken neither by any wavering of purpose nor by the breath of any vulgar ambition. His many honours, academic or public, were prized by him in proportion as he took them to be recognitions, not merely of eminence generally, but of success in the precise aims which he had set before himself. The chief source of satisfaction to him in his later years was to think that classical archaeology had gained so much ground in England, and that he had helped it forward; but this feeling was deeply tinged with melancholy; he thought of himself as the leader through the wilderness, who was not to enter the promised land. There are minds, perhaps, in which lifelong conversation with the past so confirms the habit of retrospect that the difficulties of earlier years always loom large, even after subsequent successes; so at least it seemed to be with him. But to others it will appear that, however distant the point gained in his lifetime may have been from his ideal, still the cause to which he rendered such abundant service was already gained before he died. In the future of classical studies, so long as they may exist in this country, the place of archaeology, not as an accident but as an essential, is assured beyond the danger of overthrow. Newton has been recently compared, and not unjustly, with Winckelmann. The German worked in the dawn, the Englishman, though still in the morning hours, yet in a far clearer light; between them, however, there is this intrinsic resemblance, that in both the mainspring of a devotion which ended only with life was a native instinct, intensely strong and lucid, for the spirit and the charm of classical antiquity. There are those in this room to whom the impressive personality of the master whom we commemorate will be a lasting recollection—that singularly fine head and pose, which themselves seemed to announce some kinship with ancient Hellas—that voice which so often within these walls expressed the knowledge thrice refined by ripe study and experience; a few years more and these will be only traditions; but to our successors, the members of this Society in days to come, the history of learning in Europe will bear witness that no body formed for the promotion of Hellenic studies could have entered upon existence with a worthier sanction, or could desire better auspices for its future, than those which are afforded by the name of Charles Newton.

The Athens Correspondent of the *Standard* says that Professor Durm, the German architect summoned by the Greek Government to take in hand the necessary repairs to the Parthenon, has concluded his preliminary inspection. His opinion is that the restoration can be carried out without materially affecting the general character of the structure.

TESSERÆ.

The Temple of Zeus, Olympia.

OLYMPIA consists of two very distinct parts, namely, the precinct of Zeus, and the edifices lying without the same. The precinct of Zeus, known also as the Altis and the Sacred Grove, is a walled enclosure, forming an irregular quadrangle, with a mean length of 4,000 feet from east to west (parallel with the river), and a mean width of 2,000 feet from north to south (from the foot of the mountain to the river). Within this enclosure stood the altars, temples, sanctuaries, treasuries and other buildings for the use of the officials and for the reception of the city's guests attending the festival. The space not occupied by these structures was filled with statues and votive offerings, which, as time went on, were multiplied till at last only the roadways traversing Altis were free. Pausanias has left us a precise description of Altis (written A.D. 173), which is still extant. The precinct of Zeus may be considered as divided into two parts, a northern and a southern. In the southern portion the Temple of Zeus forms the central point, around which are grouped the lesser monuments. The temple was never entirely covered with *débris*, but not till now could its whole ground-plan be seen. It was a building in character like the Parthenon, but still more imposing, for it had only six columns on its narrower façades, making its architrave blocks so much more massive. There still remains in the vestibule of the temple the ancient mosaic pavement, composed of pebbles of different colours from the Alpheios, representing Tritons and Cupids. We can measure exactly the cella; we recognise distinctly the site where stood the Colossus erected by Phidias; we see the traces of the interior columns, the supports of the galleries, to which wooden stairways led up. The material of the temple was a friable shell limestone coated with white stucco of the finest quality. The moulding flute with lions' heads spouting water, as also the flags forming the roof of the temple, were of Parian marble. In Roman times the edifice underwent a thorough restoration, the material employed being Pentelic marble. This work of restoration can be distinguished both by the material and by the marks made by the workmen on the blocks of stone. Still, the edifice as a whole is a monumental example of a Doric temple, and it is of the highest value for the history of that style of architecture. It is the work of Libon, a native artist, and dates from a time only twenty years prior to the building of the Parthenon. We find here grander proportions, a more admirable earnestness, a purer Doric than in the more celebrated temple at Athens.

The Steel-yard and the Hanseatic Merchants.

In the Utrecht treaty of 1474 the place belonging to the Hanseatic merchants is called *Staelhof*, *alias* *Stylyard*—a name which is explained by Hudson Turner and by Peter Cunningham as signifying the spot where once the great public beam and balance stood, by which all goods were weighed on landing in order to secure the king's toll. The original Guildhall of the Cologne merchants in the thirteenth century, the *Aula Teutonicorum*, was situated close to the ancient city gate on the water side, the name of which is still preserved in the adjacent lane, Dowgate. In the following centuries several estates in the vicinity were added by purchase: the house of a knight, Sir Thomas of Salisbury; that of Sir Richard Lyons; another house, given originally by Richard II. to a follower of his queen, Ann of Bohemia; five houses on the western side of Windgose Lane, and several more. In the sixteenth century the whole property was united, and offered a considerable aspect, the old hall being a huge stone building with three round gates opening into Thames Street. Each of them was adorned with a Latin distich, the middle of one ascribed to Thomas More, and not unworthy of his genius:—*"Aurum blanditiæ pater est natusque doloris; Qui caret hoc moriet, qui tenet, hic metuit."* Two large pictures by Holbein, a description of which is still extant, covered part of the inner walls. Here the worthy merchants used to assemble and conduct their mercantile and social affairs; here they also dined together on certain great occasions. On the bank of the river there had risen a stately mansion, the residence of the Steel-yard master. The space between the two edifices served as a garden with fruit trees and vines, where the young people used to amuse themselves with various games, but were strictly forbidden by a fine of five shillings to pluck a plum or an apple. A house in front with the hall was the celebrated Rhenish winehouse, the very spot, probably, where since the days of Henry II., who first sanctioned the free importation of hock to the citizens of Cologne, this wine had been sold without intermission. Thomas Nash, in his *"Pierce Penilesse, his Supplication to the Devil,"* makes a sluggard say, "Let us go to the Stilliard and drink Rhenish wine." And in one of Webster's plays we read:—"I come to entreat you to meet him this afternoon at the Rhenish winehouse in the Stillyard. Will you steal forth and taste of a Dutch bun and a keg of

sturgeon?" The same place was famous for its smoked ox tongues, which explains the allusion made in Nobbes's *"Bride,"* "Who would let a cit (whose teeth are rotten out with sweetmeat his mother brings him from goshippings) breath upon her vernish for the promise of a dry neat's tongue and a pottle of Rhenish at the Stillyard," &c. Even after the great conflagration, Blount says, in his *"Glossography:"*—"The Steel-yard was lately famous for Rhenish wines, neat's tongues," &c. The same place is adorned by a large beerhouse, still bearing the name of the Steel-yard, and hanging out as its sign an immense gilt grape, such as the traveller meets with in almost every street of the old German cities. Various other halls, dwelling-houses of the merchants and their clerks, files of warehouses, and a wharf, with a large crane, filled the remaining space, a ground plan of which was taken the year after the fire by the indefatigable Hollar. The whole place had rather the look of a small city fortified by walls, which on certain occasions, when the foreign burghers could not avoid having a quarrel with their neighbours, who, perhaps, exasperated by their many privileges, fought them manfully, served as an excellent refuge for the weaker side. All this massive grandeur has been swept away by time and fire.

William Gandy.

Whatever may have been the exact period of the change in Reynolds's style, Northcote and Leslie agree that the hints which kindled his genius were derived from the works of William Gandy. This gifted man was an itinerant artist, who roved through Devonshire and Cornwall, and died about the time when Joshua was born. Lazy, gluttonous, improvident and irascible, he dashed off likenesses at a couple of guineas a piece, with no other care than to obtain with as little trouble as possible the money which would purchase him a luxurious meal. "His portraits," says Northcote, "are slight and sketchy, and show more of genius than of labour; they, indeed, demonstrate facility, feeling and nice observation, as far as concerns the head; but he was so idle and so unambitious that the remainder of the picture, except sometimes the hand, was commonly copied from some print after Sir Godfrey Kneller. Some of his pictures are very fine and many more good for nothing, though the worst of them still look like the careless productions of a good painter." Sir Joshua said "he had seen portraits by him that were equal to those of Rembrandt." One of the precepts of Gandy was that "a picture ought to have a richness in its texture as if the colours had been composed of cream or cheese, and the reverse to a hard and husky, or dry manner." The remark was repeated to Reynolds, and how largely he profited by it is apparent from the circumstance that it would be difficult to describe more accurately the usual surface of his own paintings. The germ of his distinctive qualities may be clearly discerned in particular specimens of Gandy's works, but these merely furnished the spark which lighted up the latent powers of a far greater man.

The Hall, Hampton Court.

The hall formed no part of Cardinal Wolsey's palace, and its erection was not commenced until five years after the Cardinal had given up Hampton Court to Henry VIII., in exchange for the manor of Richmond. The manor of Hampton was granted to the Cardinal by the prior of the Knights Hospitallers of St. John Jerusalem, and the Cardinal commenced the building of Hampton Court about A.D. 1515. In June, 1525, Wolsey surrendered Hampton Court into the possession of the Crown. There is conclusive evidence that preparations were made for removing the "old hall," and laying the foundations of the "new" or present hall in 1531 (anno 22 Henry VIII.). Tilers, masons, carpenters and smiths were in full activity working on the "new" hall in the following year. In the twenty-fourth year the roof was raised. The progress of the works until the twenty-sixth year of Henry VIII. may be fully traced. After this year the entries refer rather to repairs than new erections and the building of the hall may be said to have been completed. The interior still retains most of its original features and ornaments, the pavement alone being excepted. If we may judge from a drawing made by Lysons, about 1800, the floor of the hall even then consisted of tiles—"paynted tyle ypared with poynttyl ich point after other." It is stated that Flemish paving tiles of green and yellow, at 5s. the hundred, were used anciently for the "hall pacys" in the queen's new lodging. This hall, like others in early times, was heated by means of logs of wood piled on a hearth in the centre of the building; the bright flames flashed against the rafters, and the smoke escaped from a cupola or louvre rising out of the roof. There are no remains of this fireplace, which was perhaps removed by Kent when he laid his profane hand on the hall. The restoration of the coloured glass throughout the hall was executed by Willement. The pedigrees of the six wives of Henry VIII. are set forth in alternate windows. The intermediate windows, seven in number, contain the heraldic badges of Henry VIII.

NOTES AND COMMENTS.

MUCH may be forgiven to the young artists of Paris when they find they have to reside in a city which is no longer favoured by the clerk of the weather. But there are limits to joking. Because it is not possible to take a turn in the streets students should not take revenge on the scavenging department of the Municipality by endeavouring to make artists like M. CAROLUS DURAN, M. RODIN and M. PUVIS DE CHAVANNES appear ridiculous. The dinner which was given to the last-named by his friends and admirers was made the occasion. Circulars were printed and circulated among artists. In one they were solicited to join in a dinner to M. CAROLUS DURAN, in the other M. RODIN was named as the honoured guest. The grounds for the festivals were parodied from the invitations to M. PUVIS DE CHAVANNES'S friends. We understand that similar announcements were made of dinners to other artists, but the intended victims are silent about them. In each case the letters were supposed to be issued by a special committee. Like all the other practical jokes of the young artists during some years, the latest will give rise to pity rather than amusement.

THE director of the South Kensington Museum, Mr. J. H. MIDDLETON, D.C.L., has acted wisely in resolving to abstain from seeking re-election as Slade Professor at Cambridge. His official duties should be onerous enough to occupy any man's time. The election of a substitute will therefore take place on Monday, February 25. The professor is elected for three years, but is eligible for re-election. The stipend is about 348*l.* per annum. The professor is not required to reside, but must deliver annually in the University in full term a course of not less than twelve lectures on the history, theory and practice of the fine arts. The electors are the Vice-Chancellor, Professor JEBB, M.P., Dr. PEILE, Master of Christ's; Dr. SANDYS, the Public Orator; the President of the Royal Academy; the President of University College, London; and Sir A. W. FRANKS. Candidates are to send their names to the Vice-Chancellor on or before February 18. It is time a more definite notion should be arrived at about the duties of the professors. At one time it might be supposed they were to be directors of art classes; at another time they are assumed to be only lecturers. The best type of professor was the late Sir DIGBY WYATT, for he was competent to deal with history, theory and practice. The electors would do well to seek after a gentleman who was as versatile and as engaging.

SOME months back it was announced that several schools were not in a fitting condition to receive children, and unless repairs and alterations were undertaken, the Education Department would be compelled to withhold the grants. In the three last months of 1894, the authorities of no less than twenty-six schools were served with the official warning. The names of the schools cannot be too widely known. They are:—Waddesdon (British), Buckinghamshire; Falmouth (British); Derby (St. Alkmund's National); Little Totham, Essex; English Bicknor (National), Gloucestershire; Leinthall Earles (Church of England), Herefordshire; Stoke Golding (infants), Leicestershire; Eastville, East Fen, and Fosdyke (both Church of England), Lincolnshire; Peckham (Wesleyan), London; Tottenham (Wood Green, Naas Road Board); Newcastle-on-Tyne (United Methodist Free Church); Bridgnorth (Roman Catholic) and Ludlow (Wesleyan), Shropshire; Saltford (Church of England), Somersetshire; Wolverhampton (Causeway Lake National); Lewes (British), Sussex; Allerton Bywater, Austerlands, Darton (Beaumont's Charity), Hull (Christ Church and St. Luke's), Kelbrook, Newton, Rawmarsh (High Street), and Wakefield (Trinity), all of which are National or Church of England schools in Yorkshire. A London Board School in Bailey's Lane, Upper Clapton, and Clifton Church of England School, Lancashire, have been suspended for three months or more on account of defects in the school premises. In some cases there may be extreme poverty, but as we said

on a former occasion, there are wealthy people who profess to take a special interest in all schools of the class, and now is their time to display liberality. Another instance of departmental watchfulness has been shown during the week. As the schools are now utilised for public purposes of another kind, it is advisable to know whether precautions are taken to minimise the effects of a panic in case of fire. The inspectors of schools are therefore told they are to strongly advise that all doors should be made to open outwards, and that they should be sufficient in number and size to provide for the speedy exit of those who are in the room. In large schools at least two separate exit doors are most desirable; in small schools one may be sufficient. It is not to be expected that school buildings are sufficiently elastic for adaptation to a variety of purposes for which they were not planned. The Parish Councils Act has made public buildings for meetings indispensable throughout the country, and the sooner that provision is insisted on the more efficient will be the provisions of the Act.

THE spirit of the proverb which affirms that it is not right to look in the mouth of a horse which is a gift we suppose should be respected when the gifts are works of art. Pictures ascribed to great masters abound in this country, and are often to be acquired for less than the value of the frames; but is it always wise to purchase them? The late Mr. W. RAWDON has bequeathed to the City of York a number of pictures which he believed were of value in a financial as in an artistic sense. They include, according to an inventory:—*A Holy Family*, by RAPHAEL; *Venus and Adonis*, by TITIAN; *The Doctor's Shop*, by TENIERS, sen.; *The Spanish Guardhouse*, by TENIERS, jun.; pair of portraits said to be *George III.* and *Queen Charlotte*, by HOGARTH; *Child and Dog*, by GREUZE (an unfinished picture); *Teaching the Bird to Sing*, GERARD DOW (portrait of artist by himself); *The Sick Lady*, by VAN GOYEN; two Dutch landscapes, with figures, by BREUGHEL (painted on copper); and *Woman Blowing a Candle*, by SHALKIN. Now, if all these works were genuine York would have gained an additional attraction. But how is the genuineness to be proved? Will the Corporation, before accepting the pictures, employ experts to examine them, and if their report is doubtful, will the pictures be retained? An individual may purchase as many RAPHAELS, TITIANS, and GERARD DOWS as turn up in the course of a few weeks in London; but in a public gallery we expect to see nothing that is not authentic, and if there are doubts about Mr. RAWDON'S pictures they should be returned with thanks to the executors.

FROM the annual report of the Wesleyan Chapel Committee it would appear that the outlay on buildings during the past year has been 288,055*l.* The accommodation has been increased by 19,885 sittings. The debt remaining amounts to 82,693*l.* The committee have sanctioned 373 cases, 90 of these being new chapels, 48 of which are to be erected in localities where hitherto Wesleyan Methodism has been unrepresented. The estimated outlay is 199,761*l.*, of which amount 141,963*l.* is to be raised by voluntary contributions. The total additional accommodation to be provided is 14,954 sittings.

A FIRE on Wednesday morning caused irreparable damage to the Municipal Buildings in Perth, of which the late ANDREW HEITON was architect. It was only last week we published a view of the council chamber. It is too early to be able to state the cause of the fire, but it is understood that a flue on the ground floor was overheated, and the fire commenced in the police office. It then extended to the court-room and commissioners' hall. The latter was destroyed, with its pictures and statues, besides windows which illustrated scenes from SCOTT'S "Maid of Perth." The municipal documents, it is understood, were saved. The building was so successful, it will probably be restored from the plans which were originally employed in constructing it.





IN.—PHOTO SPRAGUE & CO. 48 EAST HARDING STREET, FETTER LANE, E.C.

THE HISTORY OF CLOVIS, No 4.

THE BAPTISM OF CLOVIS.

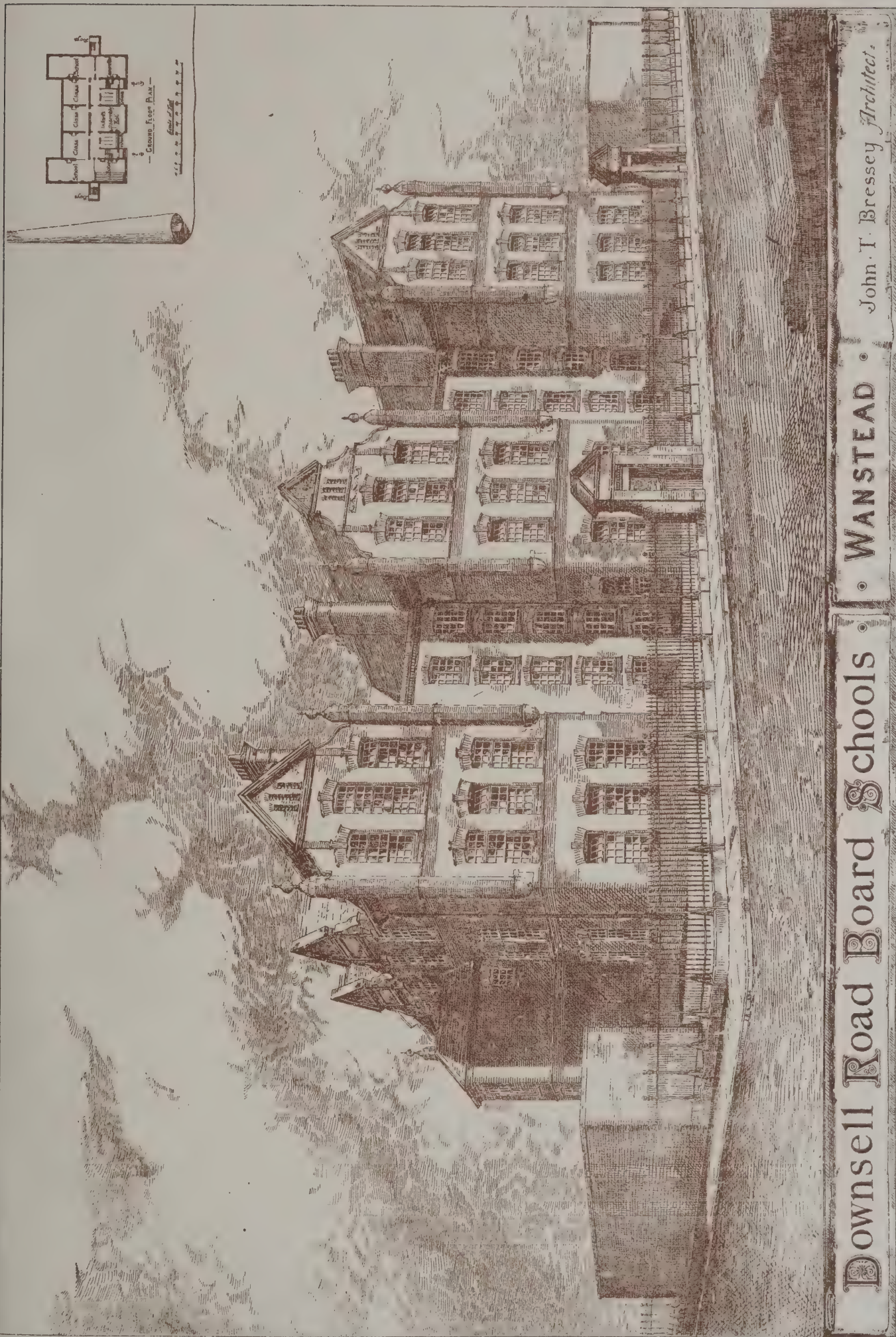
FROM THE WALL PAINTING IN THE PANTHÉON PARIS

BY JOSEPH BLANC.



- 1 Boys Lavatory
- 2 Girls "
- 3 Bath teachers
- 4 Female "
- 5 Corridor
- 6 Class Rooms

HIGHER GRADE AND TECHNICAL SCHOOLS.
for the DOUGLAS SCHOOL BOARD: ISLE of MAN.
Thomas D. Cribb, Architect. Birkenhead.

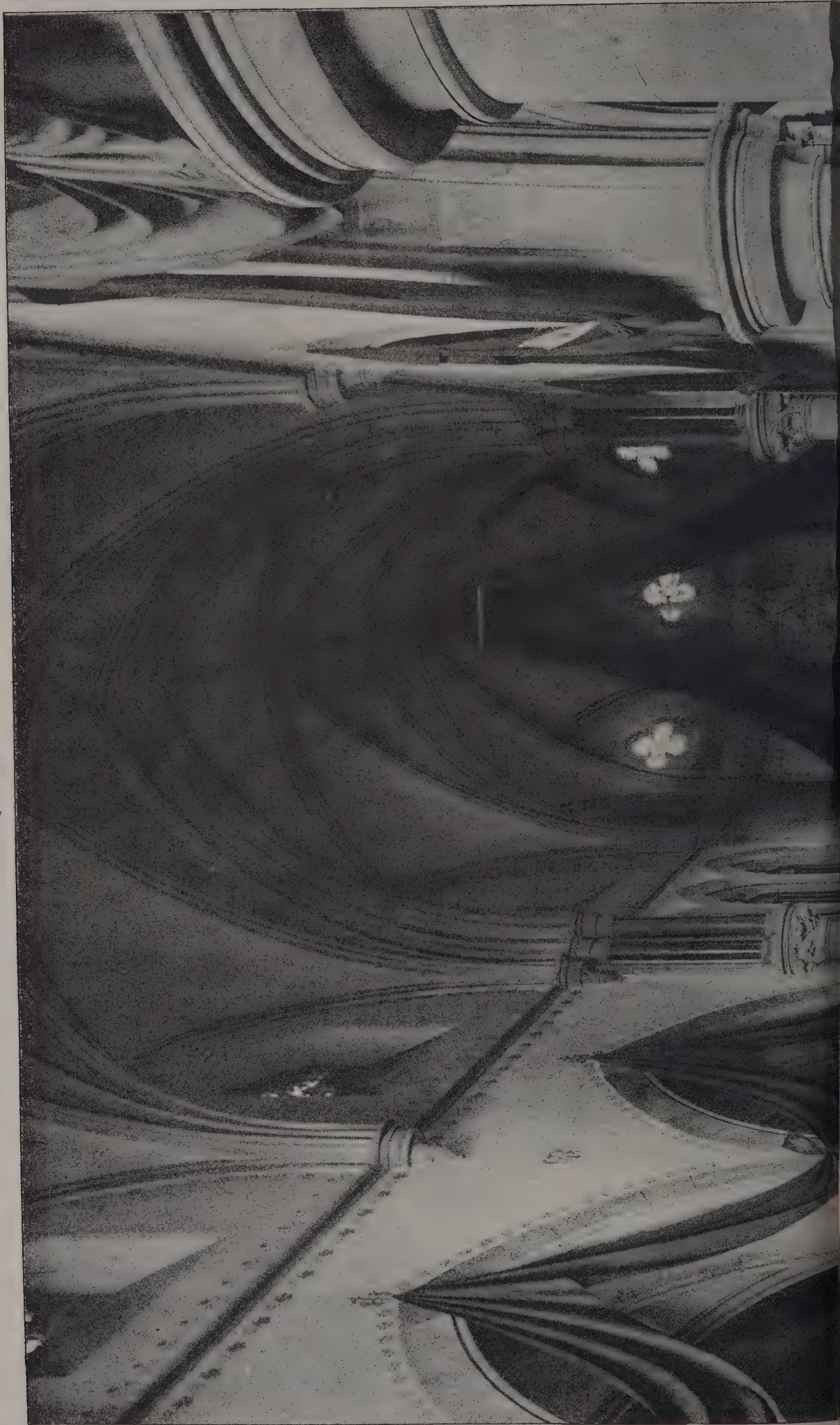


Downsell Road Board Schools

• WANSTEAD •

John T. Bressey Architect.

The Architect, Jan. 25th 1895.





1922 PHOTO. SPRAGUE & CO. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

INTERIOR OF THE REDEPTORISTS' CHURCH, PERTH.
The late ANDREW HEITON, Architect.

ILLUSTRATIONS.

THE HISTORY OF CLOVIS.—NO. IV.

AFTER the victory of Tolbiac CLOVIS kept his promise, and was baptized by St. REMIGIUS, the Bishop of Rheims. If we assume the date of the ceremony as A.D. 496, it would appear that M. BLANC has represented the prelate as too young. It is true that according to tradition REMIGIUS was appointed a bishop at the age of twenty-two, but that event took place in A.D. 457. It has been assumed that CLOVIS changed his religion through policy. According to THIERRY, CLOVIS was among all the early Frankish kings the nearest to a statesman. It was in order to found an empire that he rejected the worship of the Northern gods and became the associate of the bishops in destroying the two Arian kingdoms which were found in France. But as became a warrior of that age he was often more impulsive than subtle. GIBBON tells us "the mind of CLOVIS was susceptible of transient fervour; he was exasperated by the pathetic tale of the passion and death of CHRIST; and exclaimed, 'Had I been present at the head of my valiant Franks I would have revenged His injuries.'" The conversion of the leader was not followed by an immediate change in the character of himself or his followers. The legends attest that CLOVIS was often obliged to recognise the obstinate attachment to paganism of his chiefs. Nor were his own actions always in keeping with Christian morality. It is, however, unwise to consider the character of the individuals of the fifth century too closely. CLOVIS, with all his crimes, was an agent who helped to promote the civilisation of the northern barbarians. He led them to France, and although they conquered the Roman colonists, they were in turn overcome by their works. The influence of architecture on the wild tribes is too generally ignored, but it has been upheld in one of GUIZOT'S most memorable passages:—

What now moves ourselves, what we seek with eagerness in history, poems, travels, novels, is the representation of a society foreign to the regularity of our own. It is the savage life, its independence, novelty and adventures. Very different were the impressions of the barbarians; it was civilisation which struck them, which seemed to them great and marvellous. The remains of Roman activity, the cities, roads, aqueducts and amphitheatres, all that society so regular, so provident, and so varied in its fixedness—these were the objects of their astonishment and admiration. Although conquerors, they felt themselves inferior to the conquered. The barbarian might despise the Roman individually, but the Roman empire as a whole appeared to him something superior; and all the great men of the age of the conquests, the Alarics, the Ataulphs, the Theodorics, and many others, while destroying and throwing to the ground the Roman empire, exerted all their power to imitate it.

For CLOVIS was, like CHARLEMAGNE and NAPOLEON, a legislator as well as a warrior. An attempt was made by the chiefs of the Franks to codify laws and customs, and the result was known as the Salic Law. According to one of the old jurists, "when CHLODWIG (CLOVIS), the long-haired, the beautiful, the illustrious, had received baptism, everything in this covenant that was considered unfitting was amended with perspicuity." THEODORE, the son and successor of CLOVIS, was also zealous in applying system to law.

By the force of laws and arms CLOVIS was able to overcome the Armoricans, the Burgundians and the Goths. The whole of Gaul was under his sway. Yet, such was the power of sentiment in that age, CLOVIS did not believe he had attained the summit of ambition until he received the dignity of a Roman Consulship, which was no more than a name, a shadow, an empty pageant. But policy may have dictated his desire to become affiliated to Rome. As GIBBON says, the Romans in Gaul "were disposed to revere, in the person of their master, that antique title which the emperors condescended to assume; the barbarian himself seemed to contract a sacred obligation to respect the majesty of the Republic, and the successors of THEODOSIUS, by soliciting his friendship, tacitly forgave and almost ratified the usurpation of Gaul."

If CLOVIS had a weakness for burning the Romanesque churches of the Arians in Gaul he made compensation by erecting others for orthodox Christians. A church dedicated to SS. PETER and PAUL, which stood on the hill

outside Paris, was one of his works. It was afterwards supplanted by the church of St. Geneviève. The church and abbey of St. Pierre de Chartres and the abbey of St. Mesmin, near Orleans, may be mentioned also. One of his sons erected the abbey of St. Vincent, subsequently known as St. Germain des Prés, in Paris, and it is believed some of the ancient masonry still remains.

INTERIOR OF THE REDEMPTORISTS' CHURCH, PERTH.

HIGHER GRADE AND TECHNICAL SCHOOLS FOR THE DOUGLAS SCHOOL BOARD, ISLE OF MAN.

THESE buildings have recently been erected on a site fronting Park Road, Douglas, and provide accommodation for 550 scholars.

The buildings, which are two storeys high, are constructed of local grey pressed bricks, relieved by red-pressed bricks, the heads and cills of windows, &c., being red sandstone.

The classrooms on both floors are accessible from a marching corridor 9 feet wide, which is tiled, and has a dado 4 feet high of salt-glazed bricks. Separate entrances, lavatories and cloak-rooms, staircases, &c., are provided for the girls and boys.

On the ground floor, adjoining the boys' entrance, are arranged a head-master's-room and assistant master's-room; adjoining the girls' entrance are a female assistants'-room, with lavatory, &c., and a stationery store-room.

The lavatories and cloak-rooms are tiled, and are lined with white-glazed bricks.

On the first floor are arranged a chemical laboratory, lecture theatre, cookery classrooms, special art classrooms, &c.

The chemical laboratory has accommodation for thirty-six students, and is replete with every modern convenience, demonstration platform, fume closets, store-room, &c., and was fitted by Mr. THOMAS STORY, of Leeds.

The seats of the lecture-theatre are arranged in circular tiers, and accommodate seventy-two students.

The cookery classroom has tables, a kitchen range and gas cooking range, scullery, store-room, &c., and has accommodation for twenty-four students at practice and seventy-two at demonstration.

The classrooms throughout have a pitch pine dado 4 feet high, and are well lighted by left hand light, and are provided with STOTT'S patent ventilating sunburners. The heating is by means of SHORLAND'S ventilating grates and hot-water radiators.

The corridors, &c., are heated by low-pressure hot-water pipes and coils.

Separate asphalted open and covered playgrounds and latrines are provided for the girls and boys.

Over the boys' covered playground is arranged a joiner's workshop, with lathe, &c., and bench accommodation for sixteen students.

The contract has been carried out by Messrs. MCADAM & MOORE, contractors, Douglas, for the sum of 4,140*l.*, from the designs and under the superintendence of Mr. THOMAS W. CUBBON, architect, Birkenhead, whose designs were selected in a limited competition.

DOWNSSELL ROAD BOARD SCHOOLS, WANSTEAD.

THIS building, which will shortly be completed, is situated on the detached part of Wanstead known as Wanstead Slip. The western portion of the school, consisting on each floor of three classrooms and a school-room with lavatories and staircase, was erected in 1886; two more classrooms on each floor were added in 1888, and the plans for the completion of the building were sanctioned by the Education Department a few weeks ago. Externally the building is faced with picked stocks and kiln-burnt red bricks; internally also picked stocks are employed above the brown salt-glazed brick dado. When completed the school will accommodate about 1,800 children, and will have cost about 15,500*l.* The two earlier portions of the school were built by Messrs. A. REED & SON, of Burford Road, Stratford, E. The architect is Mr. JOHN T. BRISSEY.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening, Mr. E. W. Mountford, president, in the chair. Mr. R. A. S. Macalister was elected member.

It was announced that the first spring visit would be paid to the Church House, Dean's Yard, Westminster, where probably Sir Arthur Blomfield would meet the members.

Mr. JOHN SLATER read the following paper on

Bricks and Brickwork.

The history of the development of the human dwelling, if worked out thoroughly in a scientific spirit, would not only be a subject of the deepest interest to all who have to do with modern buildings, but would clear up many of the knotty points upon which archæologists have never been able to agree. The first rudiments of building were undoubtedly the cutting down and joining together of substantial pieces of timber, and as men grew more expert in the use of their rude implements, simple patterns would be cut in the timber, the repetition of which would form a band of ornament, and we should have the commencement of a timber style of architecture.

In China and Japan such a timber style has survived with the growth of civilisation, and very picturesque results are obtained from the elaborate carvings and decorations with which these buildings were enriched. But, as a rule, with advancing intelligence and manual skill, and with the discovery of the use of metals, men would not fail to contrast the ephemeral and destructive character of their timber dwellings with the hard, dense and apparently imperishable nature of the rocks and stones which formed the everlasting hills which they saw around them. And you must remember that, although no means of quarrying then existed, nature herself is the most efficient quarryman. Water and frost, heat and cold will in the course of ages break up into manageable sizes the hardest rocks, and I do not think there can be a doubt that the earliest stone buildings were formed of rough pieces of rock picked up haphazard and roughly fitted together, the interstices being filled in with some softer materials, such as clay, earth, or sand. Anyone who has examined the remains of the early British villages which exist in many parts of Cornwall, or the very interesting chapel of St. Piran in that county, which dates from the seventh century, cannot fail to be struck by the fact that, as far as the walls are concerned, the stones had no work on them at all, and were simply brought to the spot just as they were found on the hillside and placed in position as they happened to fit. The probability is that the first enterprising tribesman who built himself a stone dwelling would run the risk of having it pulled down about his ears by his neighbours for his presumption, but gradually his example would be followed, and we should have the rudiments of a stone architecture. But in many places as the population increased communities would settle down in districts where no stone existed and where the soil was chiefly of clay. Here the enterprising builder would find no hard material ready for his use, but he would notice how in summer this clay became exceedingly hard when the sun beat down on it, and the ingenious man would one day be struck with the idea that if he could dig up lumps of clay when it was soft, of a size that could easily be carried, and let the sun harden them, he would be able to transport them where he liked and use them to make a house with; and in this you have the first beginning of a brick architecture.

The use of unburnt, sun-dried bricks dates back to a hoary antiquity; they were made and used for all kinds of building in Egypt; Greece, where the palace of Cræsus and that of King Mausolus were thus constructed, Assyria and Persia, and in hot, sunny countries they are still used to-day. Chopped straw was mixed with the clay in order to give it a consistency, and where very little rain fell these bricks answered fairly well. In fact, they formed the principal material with which the enormous and elaborate Ninevite and Babylonish palaces were constructed. If not very carefully tempered, these sun-dried bricks soon become very friable; and it is owing to this fact that of the majority of these wonderful cities of the East which we read of in history, nothing now remains but a heap of earth and rubbish. But it is also to the fact that the rubbish appeared absolutely valueless that we owe some of the most interesting discoveries of recent years. Wherever any old stone buildings existed that became ruinous or deserted, the neighbouring inhabitants invariably used them as a quarry and carried away the stone for their own use; but in Assyria no one ever thought it worth while to cart away crumbling clay and earth. Some few years ago a Frenchman named Botta obtained the requisite permission to excavate one of these huge mounds in the desert, with only a few straggling huts around it. His explorations were continued by M. Victor Place, and the result was most unexpected, and showed that many of our architectural forms and features have a much greater antiquity than anyone imagined. One can easily understand that in a clay district it would soon become apparent that artificial heat,

such as might be obtained from a cooking-place, hardened the clay and altered its colour, but few can have imagined the use that was made of the knowledge of this property in the clay for the production of decorative effects.

These excavations took place about 12 kilomètres from the Tigris, at a little village the modern name of which is Khor-sabad, which is on the site of the great palace built by King Sargon. Buried under the *débris* of centuries was found a walled city with fine gateways, the palace itself with a magnificent arched gateway of brick, the voussoirs being carefully moulded to the proper shape and enamelled in various tints, forming a beautiful pattern, and as vivid as if they were lately taken from the kiln. Artificially burnt bricks used for paving, and so hard that when struck they rang like a bell, and the discoverers used them as paving for the floor of their temporary stables; arched covers for sewers formed of radiating bricks accurately moulded, and glazed wall-tiles in profusion were discovered. The sizes of the bricks varied considerably, the paving bricks being about $15\frac{1}{2}$ inches square and $2\frac{1}{4}$ inches thick, and these were carefully laid in two courses, breaking joint; their colour was a dull red, approaching brown. The arch-bricks in the conduits or sewers were curiously formed, every alternate course having a keystone of peculiar shape, and M. Place's belief is that the intervals were keyed with ordinary unbaked bricks, thus affording, in case of repairs being required, an easy means of entering the sewer. The height of the walls of the palace was about 15 mètres, or 49 feet, and their thickness 5 mètres, while the height of the encircling wall of the city itself was about 23 mètres, and the thickness nearly 8 mètres. The gateways, both of the city and the palace, were of such a kind as one would never have expected, being true arched openings about 14 feet in width and 21 feet high, the arches being formed of four rows of bricks very carefully laid, with radiating joints. It is a most extraordinary thing to find these old Assyrian builders planning and executing so fine a work as this. There is one peculiarity about these glazed bricks: although their colour was perfect and the bricks themselves uninjured, they were comparatively soft, and the part built into the wall could be dented by the mere pressure of the hand.

Although, as I have stated, bricks were used in Greece, yet the abundance of excellent marble in that country prevented builders having recourse to an artificial material. In Rome, however, and her colonies brick was extensively used, although recent investigations have shown that many of the old Roman buildings which were supposed to be erected of solid brick are really only brick-faced, and that the interior of the walls is concrete of the most admirable kind. Apart from this, however, there can be no doubt the Romans were excellent brickmakers, as is evidenced by the present condition of many buildings which were erected in various parts of Europe and this country during the Roman occupation. Take the Basilica at Trèves, for instance, nearly the whole of one side of which is the original brickwork, as well as the lofty arch between the apse and the main body of the building, and if you examine it carefully you will see that there was no scamping in that work. The excellence of Roman bricks is further shown by the fact that in many parts of this country what are undoubtedly Roman bricks that have been taken from some vanished building and reused in other places, are still found in an unimpaired condition of strength. St. Albans Abbey may be mentioned, where such bricks occur in large quantities, Dover Castle and many other places. It may be interesting to notice the size of Roman bricks, which are chiefly remarkable for their length and thinness. Vitruvius enumerates three kinds of bricks: the pentaduron, $14\frac{1}{2}$ inches square and $1\frac{1}{4}$ inches thick; the tetraduron, $11\frac{1}{2}$ inches square and $1\frac{1}{4}$ inches thick; and the didoron, $8\frac{1}{2}$ inches by 5 inches by $1\frac{3}{4}$ inches, the two former being used chiefly in Greek buildings, and the latter in the Roman buildings of his time. The size of Roman bricks varies considerably; at St. Albans they are found 18 inches by 12 inches by $1\frac{3}{4}$ inches, in the old London Wall $17\frac{1}{2}$ inches by $11\frac{3}{4}$ inches by $1\frac{1}{4}$ inch, while I myself have measured some in Colchester Castle about 15 inches long and barely 1 inch thick. After the close of the Roman dominion, brickmaking, as well as nearly all other arts and sciences fell into decay, and it is a curious fact that, whether in the British Isles or on the Continent, we have very few remains of any brickwork that is not Roman until about the thirteenth century. St. Sernin, at Toulouse, a church of the twelfth century, is partially built of brick, but the convent of the Jacobins at Toulouse, dating from the end of the thirteenth century, is one of the finest examples of brick building in the Middle Ages. As Viollet-le-Duc points out, it is in this part of France that good building stone is entirely wanting, and consequently the architects of the time were compelled to elaborate a style of their own in the only available material, brick. In the thirteenth, fourteenth and fifteenth centuries French bricks were of large size, about 13 inches by $9\frac{3}{4}$ inches by $2\frac{1}{4}$ inches, and the mortar joints were frequently within a fraction of an inch as thick as the bricks themselves. Moulded bricks are but rarely met with, but cut brickwork of very interesting character is found much oftener. It is clear

to my mind that Viollet-le-Duc, with all his wide knowledge and versatility, held brick architecture in somewhat low estimation, for two pages in his *Dictionnaire* dispose of the subject.

In Germany you will find brick largely used in those districts where stone is poor and scarce, but the general mode of treatment in that country is somewhat heavy and uninteresting. There are, however, many fine examples. The Marien Kirche at Lübeck, dating from the end of the thirteenth century, is one of the best specimens of German brick architecture, and this church had a great influence on the style of the surrounding parts of the country. At Brandenburg on the Havel is the fine church of St. Catherine, late fourteenth century, which has one of the most elaborately ornamented exteriors of any brick edifice. I have some diagrams of characteristic German brickwork. One is a gable from Thorn, which is an old fortified town in North-East Germany, on the Vistula. Another is a window from a church at Dobrilugk, a small town on the line from Berlin to Dresden; the third is a mullion of one of the windows of the church of SS. Mary and Nicholas at Frankfort-on-the-Oder. At Preslau, on the Uckersee, is the very fine Gothic church of St. Mary, dating from 1340, but now restored; and there is one from Seebausen. I have noticed one peculiarity in modern brick buildings in Germany, which is this—the joints are left raked out for a depth of about half an inch from the face of the work as if for pointing, but no pointing is inserted. In appearance the effect is not bad, but I should think it must increase the tendency of wet to soak through the walls.

In Spain—my acquaintance with which country is as yet, I regret to say, confined to second-hand knowledge—brick was used extensively and effectively in the Middle Ages, though in a manner quite distinct from that which prevailed in other parts of Europe. Mr. Street has little doubt that by far the larger part of the brickwork in Spain was done by Moorish workmen, who retained their old constructive traditions. The special peculiarity of Spanish brickwork seems to be that it was rarely moulded, and effect was obtained by simple projections, as at Zaragoza, where patterns are formed by setting forward the bricks forming the outlines from $1\frac{1}{2}$ inches to 2 inches beyond the general face of the wall and filling up the spaces with a diaper of small tiles. All the Spanish bricks are narrow—a little over $1\frac{1}{2}$ inches thick—and the mortar joints are half an inch thick. The Torre Nueva, in the same city, used to be one of the very finest specimens of brick architecture, octagonal on plan and the faces covered with diapers; but, unfortunately, as you are probably aware, this most interesting relic of the Middle Ages has very recently been taken down because of its leaning so much out of the perpendicular. At Toledo the churches of San Roman and Santa Magdalena are excellent examples of the simple and proper use of brickwork. One of the diagrams shows the campanile of this church. The construction is rubble stone with string-courses and quoins of bricks perfectly square and with very thick mortar joints. As I have for some time had a great distaste for what is called gauged brickwork, where the bricks are rubbed down and set in putty with as fine a joint as can be made, Mr. Street's opinion on the effect of these thick joints is gratifying as well as interesting. He says of Santa Magdalena:—"The bricks are used very roughly and picturesquely, with a very thick mortar joint, and the consequence is that every part of this work has a value in texture and light and shade undreamt of by those who have never seen anything but our own smooth, smart and spiritless modern brick walls, built with bad bricks and no mortar." And he goes on to say, in a note, "I am aware that, in saying this, I blame myself as much as any one else."

The Netherlands are rich in brick buildings, and I know nothing much more interesting than a ramble through the narrow streets of some old Flemish city where each house seems to try and outdo its neighbour in the quaintness and originality of its steep brick gables. Picturesque, however, as these are, they always strike me as somewhat wanting in grace and refinement. They are the honest and often successful efforts to escape from monotony of a somewhat rough and uncouth race, whose exuberant genius was unrestrained by any knowledge of or love for proportion such as is shown in Classic architecture. The general effect is quite charming, and we, who are accustomed, in the majority of our English cities, to the horrible monotony of a straight skyline formed by a parapet which completely conceals the roofs, can readily forgive the quaint fancy which ran riot in these stepped gables; but the detail is often unsatisfactory, and it is not till we visit North and Central Italy, where the Roman genius and Classic traditions had lingered longest, and where the strength of the northern Gothic was restrained and curbed by the southern love of colour and refinement, that we find the highest development of a brick style in architecture, and an examination of these buildings will, I think, effectively dispel the notion which some people used to be so fond of holding, that brick is a vulgar and inferior material, unfit for use in a large monumental edifice. Street's volume on "Brick and Marble in North Italy" came nearly forty years ago as a revelation to

many, and the swing of the pendulum which, during the last few years, has sent Gothic art out of fashion and has brought to the fore a style which, with all its merits, appears to me to carry in itself the seeds of its downfall and decline, as surely now as at the time of its first inception, in that lack of reserve and striving after the *outré* and the fantastic which speedily swamped what was true and good and beautiful in the Renaissance, and led to all the monstrosities of the Rococo—this late rebound, I say, may very probably have prevented the student of the present day from giving that attention to the Gothic architecture of North Italy which it well deserves. Personally, I know of no more delightful field of study, and can only regret that circumstances have not allowed me to visit it more frequently. The lovely variety of tint of the mingled brick and stonework, the juxtaposition of the circular and pointed arch, and, above all, the charming simplicity with which the most beautiful effects are produced, all combine to make the brick architecture of this district unequalled in attractiveness.

Take Verona, for instance—the city which lives in my recollection as the most picturesque in its surroundings and the most interesting in its buildings of any that I have ever visited. The first thing that strikes the eye here is the noble campanile which rises from the group of buildings at the corner of the Piazza dei Signori to a height of nearly 320 feet, though its lower part is concealed by surrounding buildings. It is built at first in alternate courses of brick and stone and then wholly of bricks. For more than half its height it is quite plain, entirely without buttresses, and pierced by three or four small openings only, and then there is a belfry stage, above which is an octagonal storey of later date. The belfry windows are contained under a large pointed arch, and are divided into three lights, with coupled marble columns, the voussoirs of the arches being alternately of brick and stone. Verona is absolutely full of objects of interest, but I can only mention a few as illustrating my subject. The cloisters of the church of San Zeno are, to my mind, some of the most beautiful I have seen. The arches are of brick pointed on two sides of the quadrangle and round on the other two, and on one side is a small projecting arcade; they are without mouldings, and are supported on coupled columns of red marble.

The arcading of San Fermo Maggiore may also be mentioned; and strolling along the narrow streets of the city numerous interesting bits of brickwork will be discovered. There is one special characteristic of the treatment of brick and stone in Verona, namely, the introduction of narrow courses of bricks between the arch stones and the plain walling, or between two rings of voussoirs. This serves to accentuate the arch and to keep it distinct from the main body of the wall, and is an effect that might well be imitated in our own buildings. Venice, which of course has a charm all its own, is not very rich in examples of brickwork—or rather, perhaps, I should say that the examples are not of such excellence as in other Italian cities. The church of the Frari is one of the most interesting examples, and there are one or two early campaniles in brick, San Giacomo, del Rialto being the best. San Giovanni e Paolo, or Zanipolo, as it is called, has an elaborate cornice. It would be both easy and interesting to devote some time to the description of other Italian cities, such as Brescia, Mantua, and especially Cremona, but these would almost demand an evening for themselves; but there is one Italian city which must not be passed over, as it is built entirely of brick—I mean Bologna. The first view of its heavily-arcaded streets is undoubtedly somewhat depressing, but the student of brickwork will find any number of most interesting details. The magnificent church of San Petronio is almost entirely of brick, both inside and outside, and is most impressive from its grand proportions and the excessive simplicity of all its details. There can be little doubt that this church exercised considerable influence on Street, as is shown in some of the late churches which he built. But it is for its domestic work that I think Bologna most interesting, as it shows us with how little trouble and expense we can increase the architectural effect of our plain brick buildings. The brick cornices and corbel tables show any amount of variety. With these few and very inadequate remarks I must leave the subject of Italian brickwork, strongly advising everyone who has not yet done so to take the earliest opportunity of making acquaintance with it, or if that is impossible at first hand, to study Street's book on it.

In our own country, after the Roman occupation terminated, very little seems to have been done in brick until the fifteenth century, although there is one building—Little Wenham Hall in Suffolk—which dates from the end of the thirteenth century. The bricks here are interspersed with stone and flint courses, and they are of widely different shapes and sizes, and when I visited the building a few years ago with a few architectural friends, we came to the conclusion that it is very probable the bricks were not made purposely for the building. In the Eastern Counties bricks were largely used during the fifteenth and following centuries, one of the finest examples

being Layer Marney Hall, Essex, which has been frequently illustrated. Who was the architect of this building is not, I believe, known, but he was certainly a man of considerable ability, and, I am disposed to think, familiar with some of the Italian terra-cotta work, as not only in the main building, but in the outbuildings also, there are several charming little bits of moulded brickwork. Sutton Place, near Guildford, is a beautiful example of brickwork; but here the influence of Italian Renaissance is manifest, and there can be little doubt that Italian workmen were employed on this building. The detail is pure, the ornament refined.

In Queen Anne's reign English brickwork was under the full domination of the Renaissance, and truly wonderful was the result. As far as workmanship goes, it was admirable. Pilasters, cornices, panels, swags, bunches of fruit and baskets, and, in fact, all imaginable detail was formed of cut bricks with an ingenuity and at a cost of labour that almost excites one's pity. I quite admit the charm of some of the older and simpler forms of this style that are met with most frequently in old country towns where age has given a mellowness to the work, and where nature has so often added to the picturesqueness by the creepers which have overgrown the exterior; but of the later developments of the original style and of the modern imitations of it, what can we say? I am aware that I am on somewhat delicate ground here, and I feel perfectly that my own opinion is a mere personal matter and worth no more than any other person's; but I can only say that much of the modern brickwork in imitation of the Queen Anne style fills me with horror and detestation. When I see pilasters tacked on to a front which not only have an exaggerated entasis at their sides, but come bellying out in front like the sails of a ship, they remind one of the fable of the frog and the bull, and the bricks seem swollen with conceit at having attained to a form utterly foreign to their nature. And it is this, rather than the ugliness, which I so strongly object to. Brick is a hard material, moulded and baked in a kiln, and moulded bricks seem to me perfectly legitimate; but surely the original baked surface is the most fitting to resist the weather, and if you go and rub and cut all the surface off, and then give the material a shape and form utterly foreign to its nature, you are completely reversing the practice of the Mediæval builders, who have left us the most magnificent examples of their skill, and who invariably gave to each material they employed the ornamental treatment which it was best fitted to receive. Much of this modern treatment of brickwork seems to me on all fours with, and just as reprehensible as, the practice which prevailed in the early part of the century in London houses, where we find a small porch carried by what appears to be a solid stone column of the Doric order, but which turns out to be constructed of wood bent to a circular shape and kept there with an infinity of trouble. In each case the material has been tortured, and bears on its face the imprint of its suffering. Having now given you a very rapid and incomplete *résumé* of the historical part of my subject I come to the second portion of what I have to say to you this evening, which relates to the actual materials with which our brickwork is constructed.

I do not think it necessary to occupy your time with any detailed account of general brickmaking, as you can get the information from the various text-books which treat of the subject. You know there are two main distinctions in bricks, viz. clamp-burnt bricks and kiln-burnt bricks; in the one case the fuel being mixed with the clay and all being burnt together, of which kind a London stock is an example; and in the other case the brick being formed of the clay, or rather the mixture of clays and sand and other ingredients—because it is quite exceptional to find a clay that of itself will make good bricks—and then being baked in a kiln, of which there are many different sorts. The thorough tempering of the clay, and mixing it well together, are very important points to be attended to. A very large quantity of brickmaking machinery is now in use, and a great deal of stuff that years ago would have been quite useless is now ground up and made into bricks, and the heavy machine-pressers give a smooth face to many a brick which is really not at all fit for use in a building, at any rate when exposed to the weather. You will often find that a smooth-faced pressed brick will flake off. I have particularly noticed this in the inferior kinds of white Cambridgeshire bricks and in those made near Hitchin and in that neighbourhood; and the reason is, I believe, that the outer layers of the bricks get more consolidated than the inner ones and a loss of homogeneity is the result.

The use of glazed bricks in buildings has very largely increased during the last ten years, and as I have myself been using a very large number in a factory which I am building, I took the opportunity last month of going over one of the large Leeds fire-brick works, and a short description of this kind of brick may not be uninteresting to you. The Leeds bed of fire-clay extends for a distance of six or seven miles only, and is associated with a thin seam of coal. The depth at which the clay is found varies from about 100 to 300 feet, and the seams are about 2 feet 6 inches thick. The following is an average analysis of the material,

and in the diagram on which this is shown I have put alongside it the analysis of an ordinary brick clay, that you may compare the two.

	Fire Clay.	Ordinary Clay.
Silica (Si O_2)	68.74	49.44
Alumina ($\text{Al}_2 \text{O}_3$)	18.94	34.26
Oxide of Iron ($\text{Fe}_2 \text{O}_3$)	1.45	7.74
Lime (Ca O)	0.19	1.48
Magnesia (Mg O)	0.03	1.94
Alkalies	0.05	5.14
Water	2.25	
Organic Matter	8.20	—

The clay, except where found quite near the surface, is almost as hard as rock, and has to be dug with a pick much in the same way as coal. The clay must be exposed for some time in the air to get thoroughly weathered, and then is sorted in order that all the particles of coal, ironstone and shale may be removed, as these spoil the brick. The clay is then crushed in a sort of mortar mill with a perforated bottom, having holes about one-eighth inch diameter. It is then taken to the tempering-pan, where water is mixed with it to the proper consistency. The tempered clay is then taken to the moulder who forms the brick, and then it goes to the drying-floors to stiffen. After that it goes to the presser and is very carefully weighed, because if one brick has more clay in it than another, the contraction during burning would be different and the sizes would not agree. It is then pressed in a small machine worked by hand and gauged and fettled up, and is soon ready for the dip. There are two kinds of material in which the faces of the bricks intended to be glazed are dipped; the first is called the body, and the other the glaze. Different firms have different recipes for body and glaze, but the materials used for body are Ball clay or blue clay, Cornish stone, flint, china clay, and plaster of Paris, in different quantities. These are calcined and ground to the finest possible trituration, mixed with water, and passed several times through a fine brass-wire sieve, having 120 meshes to the inch. The glaze is made of Cornish stone, felspar, flint, whiting, and plaster of Paris. After being dipped in the body the brick is left till the shine goes off in its face, and is then dipped in the glaze.

The materials which I have mentioned will give only an ivory or white brick; if other tints are required, such substances as oxide of cobalt, green chrome, bichromate of potash, or manganese are mixed with the glaze. Some stains, however, will not retain their colour in the heat required for a hard glaze, such as red and deep maroon, and in such cases the bricks are enamelled. In this process the enamel colour is mixed with a flux and ground together, and then, when quite dry, an oil formed of turpentine and resin is mixed with it, and the mixture is applied with a flat camel's-hair brush to the surface of the brick, which has already been dipped in body.

The bricks are then ready for burning, the kilns in which they are burnt holding from 18,000 to 20,000 bricks. Various coloured bricks may be burnt together, and experience shows what position in the kiln is best for the various colours. The glazed face must never be exposed to the flame. The kiln takes roughly about three days to burn and three days to cool, and uses about 25 tons of good coal. The brown salt-glazed bricks are made by simply throwing common salt into the fire when the bricks are burning. I am indebted to the Wortley Fire Clay Company, Leeds, for very kindly supplying me with the information enabling me to give you this short description of glazed-brick manufacture, and they have sent me up specimens of the stuff and the manufactured article.

To return to ordinary bricks. What is a good brick? Speaking generally, the characteristics of a good brick are:—1. Regularity of shape, so that when built into a wall the pressure is equal over its surface. 2. Toughness as opposed to brittleness, *i.e.* it ought not to snap when broken, but should require two or three hard blows. 3. Clearness of ring when gently knocked against another brick, and not a dull, heavy thud. 4. Homogeneity of surface and texture in the interior, and, above all, absence of small stones and pebbles or lumps of chalk; and 5, non-porosity, *i.e.* a slowness in absorbing water. I am very much disposed to think the latter quality the most important, and one that is perhaps least attended to—I mean, of course, with facing bricks. The rate at which a brick—or, for that matter, stone either—absorbs water is a more important element in its goodness than its total absorptive power, because when built in a wall the bricks are exposed only to intermittent wettings, and if in testing two samples of brick I were to find that one absorbed 15 per cent. of its volume of water in the course of an hour, while another absorbed 20 per cent., but took four hours to do it, I should prefer the latter. The crushing strength of a brick is an interesting subject of inquiry; but practically you will find it very rare indeed for bricks to be exposed in walls to anything approaching this crushing strain. Professor Unwin, at the Central Institution, Kensington, kindly tested some bricks for me a few months ago, and it was found that a Leicester brick

was crushed with a load of 245 tons per square foot, a Coventry brick at 217 tons, and a London stock at 125 tons, while a blue Staffordshire brick only cracked under a load of 385 tons per square foot, and could not be broken by the machine. A two-brick wall carried up 102 feet high, which is of course much higher than would ever be done in practice, would exercise a pressure of 5 tons per square foot on the lowest course, and this will show you how small is the chance of a brick itself being crushed; but a brick and brickwork are two very different things, the intervention of the mortar-joints introducing an entirely new element. Brick piers are very awkward things to experiment upon, and require very special machinery; but some practical experiments upon them have been made in the United States, and you may take it that three tons per square foot in mortar and five tons in cement are about the safe loads that should be placed on brickwork.

A gentleman whom I have not the pleasure of knowing has suggested to the secretary that it would be very instructive if I were to show some specimens of bad bricks, and point out how to find them out. The reason why some bricks in a clamp or kiln are good and others bad—irrespective of their position—is very difficult to understand even by practical brickmakers, but the most eminent firms are quite willing to admit that they do get a number of bad bricks, and one gentleman told me that out of a very large number of burnings his experience would lead him to the conclusion that 30 per cent. on an average were of inferior quality. What becomes of this 30 per cent.? One practical point is never to be guided in choice of a brick by colour alone, as it may frequently happen that what looks like an excellent brick may really be as bad as they make them. Knock them together and see how they ring—a bad brick will never ring well—and then break the brick and see its interior. If you see pebbles, or find the interior soft and not of close texture, you may safely condemn the bricks.

Underburning is, I believe, a fruitful cause of inferiority in bricks, as they are then soft and friable; and from my own observation I should say that, if you notice a load of bricks coming on to a job with a large number of broken ones among them, the chances are that the bulk of the bricks are bad ones, and they should be rejected. This is altogether apart from the risk to the work owing to the temptation to the men to use snap headers. To revert for a moment to the question of porosity. I believe if in an ordinary brick wall you were to pour water on the face at a level of about 6 feet from the ground, none of it would run down as far as the ground; the water would get absorbed before it reached so far, and this with very fair bricks. It may be of interest to you to know of an easy method of rendering a brick wall almost, if not quite, impervious to water. Wash the surface over with a solution of soft-soap and water, about half a pound to a gallon, laid on with a soft brush; and, when that has dried in, apply a solution of alum and water, mixed in the same proportions, and the result will be that you have waterproofed the wall.

It goes without saying, that however good your bricks may be you will never get good brickwork unless good mortar is used, and anyone who is in the habit of inspecting old houses will have noticed that in nineteen cases out of twenty it is the mortar which has perished and not the bricks. In fact, I believe a good brick is just as good after one hundred years' use as when it was new. I am sure the difficulty which public officers have with the speculating builder lies more frequently with the composition of this than with the bricks. The stuff which the "highly respectable building man" will endeavour to pass off as sand is of a fearful and wonderful nature. Sometimes he will use sand, but of such a soft, sugary texture, with no sharpness about it, that it is impossible for it to make good mortar. This you can test for yourselves by trying it between your fingers. But I should strongly advise you to look with the greatest suspicion on a heap of brownish grey stuff, which the builder will tell you is road sweepings. I am not saying that in country districts where the roads are mended with granite, if the road siftings lie in heaps for some months and are carefully washed you may not obtain a very good building material, but as a rule there is much organic matter in road sweepings, and it is very easy to mix garden loam with it, which is, of course, utterly unsuitable for mortar. Another thing that men will often try to use for mortar, especially for a building which is to take the place of one recently pulled down, is the siftings of the old lime and plaster which has come from the *débris* of the old houses. Sometimes you may spot this unmistakably by the smell, as I myself once did, a heap smelling very strongly of stale smoke from chimneys. As to lime, it is utterly impossible to discuss this question at the far-end of what I fear has been a terribly long infliction on you—it would take an evening to itself. I can only say I much wish it were more frequently the practice to build with cement-mortar. I am sure that cement and good sand mixed 5 and 1 would make better work than ordinary lime and sand mixed 3 and 1, and the extra cost would not be very great. There is one thing that you should be on your guard against in country districts—never

allow any brickwork to be built in chalk-lime mortar. It never sets in the interior of the joints. As to the joints, except in winter, I should always prefer to have the joints struck as the work goes up, rather than raking them out and pointing afterwards. There is always the risk of not raking the joints out far enough, and the chances are that the pointing will not adhere to the mortar in which the bricks are laid. Whether you have a struck joint or a pointed one, insist upon having it cut in at the top of the joint, and not at the bottom. The men will always do this if they are explicitly told to, but if not they will always cut it in at the bottom, why, I have never been able to understand, giving a lip on which the water collects. In hot weather you must be careful to dip the bricks in water before laying them, or they will absorb the water out of the mortar far too quickly, and prevent it setting properly.

One word in conclusion. In this country it can very rarely fall to our lot to be allowed to carry out a commission under those ideal conditions to which Mr. Brydon alluded last Monday evening in this room, when criticising the students' work at the Institute, viz. where cost is no object. Economy and utilitarianism are the conditions under which much of our work has to be carried out. We must often, therefore, be compelled to give up the use of stone and to fall back on brick. But do not let us on that account despise our material. It is a good honest material, which lends itself to an inexpensive decorative treatment of a perfectly legitimate kind, and I can only hope that in this short paper—the deficiencies of which I am fully conscious of—I may have given you some reasons for not neglecting the study of the history of brick in the past, and I am confident that such a study will be productive of nothing but good in its results on the brick architecture which you will have to construct in the future.

Mr. CLEMENT BROAD, brick manufacturer, Paddington, said that brickmakers were often at a loss how properly to supply architectural requirements. He referred to a specification that required selected stocks for one part of the work and picked stocks for another. Not knowing the difference, after careful consideration he supplied malm cutters, a soft brick. Competition and the system of close tendering was against the supply of good brickwork. Then he alluded to the various kinds of bricks in the market. From the same kiln were drawn shuffs, place bricks somewhat under-burnt, grizzels less under-burnt; next stocks, shippers, so-called because originally exported, and malms. Speculative builders were the best customers for the under-burnt bricks: whether they paid for the goods or not was a question. London stock bricks never decayed, contrary to what happened with some bricks from the Continent.

Mr. H. W. PRATT proposed a vote of thanks to Mr. Slater, and said that the lecturer had treated the subject exhaustively, both from a practical and an historical standpoint. For the substantial and enduring brickwork he preferred a wide to a thin joint. Sound-proof bricks for party walls were a desideratum, but he objected to the too pronounced weatherings so often seen in external brickwork.

Mr. F. T. W. MILLER seconded the vote of thanks. For the best brickwork he considered the universally adopted dimensions of bricks were not the ideal ones. The Roman form of bricks, much flatter, approached nearest the ideal of perfection.

Mr. OWEN FLEMING queried whether it was essential to put the best quality of bricks into internal walls. There was no undue crushing strain on internal brickwork.

Mr. S. BEALE disagreed with Mr. Slater in objecting to rubbed brickwork.

Mr. J. C. STOCKDALE expressed himself in favour of thin bricks for facing purposes, and recommended the use of salt glazed bricks, because they gave a pleasing variation of colour.

Mr. GARBUTT also supported the vote.

Mr. GOLDSMITH described the beautiful brickwork in Holland, which was flatly treated. In choosing bricks they should only rely on the actual results of their examination in the brickfields.

The President put the vote to the meeting, and it was carried by acclamation.

Mr. SLATER acknowledged the compliment, and the meeting adjourned.

A SYRIAN TEMPLE RUIN.*

IT is impossible to visit any of the ancient ruined cities of Syria without a feeling of interest which is intensified by a touch of sadness. The thoughtless traveller looks at the vast ruins, enormous colonnades, huge capitals rich in sculpture, and passes on with a wondering comment. The historian enters deeper into their meaning and they become to him the battle-ground of nation after nation. But to the artistic mind they are the records of a past grandeur and show us what we

* A communication from Mr. Charles A. Rich in the *American Architect*.

must have lost and of how much we have no authentic record in detail.

This thought struck me most forcibly in exploring Baalbek, whose ruins are among the most vast in Syria and of stupendous grandeur. I longed for a Pausanias who might have walked through the old city as he did through Athens, remarking carefully upon the visions of marble and statuary which I know must have stood on every hand, the votive offerings which must have lined the temple walls, the bronze, ivory or even golden statues, or better, giving us some glowing descriptions of the figures still standing in their niches, which might perchance have rivalled an Olympian Hermes or a beautiful Athene.

But no such good luck favours us, and we are obliged to rely upon imagination to people the temples with worshippers and the niches with their appropriate occupants; and yet, with all this lack of life and spirit in detail, Baalbek stands to-day the most interesting ruin in Syria. Oriental writers help us a little in the task, for they describe the ancient city as one of the most beautiful cities of Syria, enriched with palaces of great magnificence, monuments of artistic workmanship, temples of stupendous size and beauty, by virtue of its situation abounding in luxurious trees, and withal a city where, indolence being the result of wealth, studied enjoyment was the legitimate outcome and the natural pursuit of the people.

As I read these descriptions, six tall white columns rise up before my mind and carry me back to a little hotel window in the small village that surrounds the ruins of Baalbek. We had mounted a diligence at Beyruth, and, in company with the genial American consul, Mr. B—, had climbed the mountains which run far back of the Mediterranean seaport and disappear into the distant mist-surrounded snow-capped peaks. No more beautiful road could be imagined than this road over the Lebanon Mountains between Beyruth and Damascus. The road winds up and up in zigzags, which constantly change the view from the mountains to that over the sea away below, until at last, just before passing the brow of a hill which forms one side of the wild and romantic glen of Hummane, we come to a standstill and gaze in wonder at the glorious view. Mountains are on all sides, some snow-capped, and from these the breezes come cool and invigorating. Beyruth lies miles away and hardly distinguishable, and, beyond all, the Mediterranean Sea—a sheet of azure blue, on which specks reveal the presence of ships, but which ends at a soft horizon-line which marks the limit of vision.

In the glen below the little town of Hummane, which once sheltered Lamartine and gave the town its notoriety, nestles in a bower of plantations. We have clambered up 5,000 feet above the sea, and the scenery is wild and grand beyond description, and fragrant with the odour from the huge groves of trees which form the famous cedars of Lebanon.

When we have travelled thirty miles we approach the little town of Shtaurah, which consists of a few straggling houses and two hotels. The low archway of the smaller one is inviting, and a rude staircase winds up over the arch and gives access to a balcony on which stands a Syrian youth who smiles a welcome as we make our choice. The smile grows broader when we accept the welcome, spoken in French, for this lad turns out to be a student in his way, and has been mastering the idioms of the far away and, to him, unknown country.

Entering, we are assigned a large room adjoining the dining-room, whose windows open on the rear court and are at present occupied by a couple of the barn-yard fowl, who also bid us as good a welcome as their knowledge of language will allow.

Thinking to be forehanded in getting a carriage for the morrow to Baalbek, I told the young Syrian lad that we wanted the best team the proprietor could give us, but was dumbfounded when he said there were fifteen people ahead who were to take the large teams and mules, and that we would have to wait a day or so. "Not so," I confidently told him, "for whether anyone else has a carriage or not, I am bound to have the best one you have," and that the getting of it beyond the reach of anyone else meant just a midjidie (or a dollar) to himself. Verily the preacher was no traveller who affirmed that "the love of money is the root of all evil." The love of the dollar won us the day and our team besides; whether the "root of the evil" came to the boy after we had gone we never knew. At one o'clock in the morning the youth knocked softly at the door, laid out his scheme, received one-half his fee, the remainder to be paid when we should enter the carriage. It is needless to say we started early, before our neighbours were astir.

Upon turning off from the main road to Damascus the scenery changes completely. It follows through fertile plains skirting along the base of the Lebanon range. To stir up one's mind, add interest to the trip, and start up a sort of retrospection of time, we come to a building about 210 feet long, which the natives confidently assert is the tomb of Noah. What Mark Twain might have remarked at this point it is hardly possible to guess. Certainly, we argue with our driver, after the adventures of the Biblical mariner by sea, it would be

natural to seek some point away up high, back from invading floods, and, on the whole, tradition may be true. To look with distrust on anything the natives tell one is a sign of arrogance, and we are therefore happy to know that we have seen so remarkable a structure, and are careful also to let the native guide know that we are thus edified.

After several hours' travel away to the east, and at the foot of the Anti-Lebanon range, ruins can plainly be seen with the glass, and passing over the intervening plain we return to the vision which greeted our eyes as we looked out of the little window, and saw the grim acropolis of ancient Heliopolis, and the six white columns which stood out in the moonlight against the soft blue sky of a Syrian night. Almost under our windows, too, was the little circular Temple of Venus, where the goddess of youth and beauty, surrounded by her nymphs, was wont to bestow her favours in the licentious rites instituted by her admirers.

Such a night is enough to make the historian use all his powers to pierce the gloom that seems to envelop the early history and origin of the city which must have surrounded these ruins. But, although legend and tradition has been plentiful, no authentic data can be set down, although undoubtedly the city was known by some other name. Joshua speaks of the "city of Baalgad in the valley of Lebanon under Mount Hermon." This comes pretty close to a good description, but Hermon is fifty miles south of the present location, and this reference to a city 1450 B.C. does not seem to be tenable. Others have affirmed that it was constructed by Nimrod and his giants after the flood. Our guide believes it to be the oldest city in the world, and backs up his argument by the old tomb of Noah near by. His position stumped us to answer, for if old Noah's bones were laid where our good fellow affirmed that they were, it was just barely possible, yes, even probable, that he had planted the ancient city before us.

To Solomon also is ascribed the honour of its birth, since in 1 Kings ix. it is stated that "Solomon built . . . Baaleth and Tadmor in the wilderness . . . and in Lebanon." Now Tadmor is recognised as the city of Palmyra, and it is quite tenable to hold that the two glorious cities of Baalbek and Palmyra were referred to. The date then would be about 1000 B.C.

Such reasoning is easy, but the proof not authentic.

The more reasonable explanation of the name, however, has nothing to do with its ancient name, whatever it may have been. Baal was a recognised god, a deification of the sun, whose sanctuaries were erected in many pagan cities. The plain between Lebanon and Anti-Lebanon was known as Beka'a, and it is more reasonable to suppose that the name Baalbek simply signified that it was a city of Baal in Beka'a. And throughout the Græco-Roman period the city was referred to Heliopolis.

We have just come, however, from Egypt with its wonderful remains. We know that the Egyptians came into the land of Syria, and the Ramesseum at Thebes in its hieroglyphics states that the king journeyed thither and built huge structures and dedicated them to their gods. At Abu-Simbel, also, these expeditions are described minutely, and the districts pointed out correspond to the plain of Lebanon. The foundations of the chambers under the great Baalbek temple are constructed in the same manner as many in Egypt, and the general plan of substructure is much the same. I shall, therefore, beg to believe that Baalbek was made notable, if not founded, by the Egyptians, and furthermore that the old hero of marvellous works, Rameses II., is responsible for the above foundations and substructures of the Temple of the Sun. Surely the sun of such a people, the builder of such marvels of architecture in Egypt, might well have been their author.

Just as these Egyptian finger-marks are discernible in the substructure, so we are certain that the colossal platforms and the bevelled masonry under the peristyle of the Temple of Baal was of Phœnician work. And as we proceed with such deductions history begins to assist us, for we know that under Græco-Roman dominion the whole structure was reconstructed, Julius Cæsar formed a Roman colony, and the Temple of Jupiter and the Temple of the Sun were added to the already magnificent structures of the acropolis.

The ruins having been used by the Arabs as a fortress, parts of them have been built up high above the surrounding plain and form a veritable acropolis. To the eye, from the village, it seems threescore feet high, possibly, and the walls are encircled by a swift running stream, clear as crystal, near which are masses of tall trees with white trunks not unlike our native poplar. The tops just reach the temple platform, and the scene is exquisite and full of poetic feeling.

To the west the character of the work changes materially. Here are the cyclopean walls of the Phœnicians, which are the wonder of everyone who sees them, and call up the question of ancient methods of raising heavy stones. Six gigantic blocks of stone seem to form a sort of substructure to the work above. The stones are 30 feet long and about 13 feet high, cut with perfectly smooth faces, so carefully jointed that

the joint is hardly visible, and even in measuring these stones with the tape-line the joint is passed over by the eye. Above them, next come some stones which measure 64 feet in length and 14 feet in height. The old wall above these cyclopean stones was probably of Græco-Roman work, but it has been more or less pulled down, and all around are evidences of the rough work of Arab fortifications, consisting of column bases, friezes, capitals and bits of priceless detail.

In regard to the huge stones of which I have spoken, the quarry near by is interesting because there is one stone half cut out and left by the ancient builders. It is 69 feet 3 inches long and 14 feet square, and as we look at it we are caught questioning ourselves as to the resources of these unknown masters of past ages. To our modern eyes it would seem no easy task to construct lifting-machines for such weights, and true it is that no modern work has even been erected calling for such gigantic morsels. It is possible, however, that a recent discovery has given light on this point; it is at least an interesting addition to our knowledge. At Salkhat in the Hauran, which is that part of Syria beyond the Jordan, the fragments of an ancient lifting-machine have been discovered. The crumbling decay of ages and the corroding rust of metal has still left its traces on a simple gigantic lever, the fulcrum of which was supported on a huge tripod pedestal. Both of the members were composed of huge trees bound together with straps of metal, and the one found showed a height of 60 feet. The huge pivot was metal, and a large cage of iron chains and bars hung from one end while a gigantic grip was attached to the other end. Fill the cage now with small stones until it balanced the huge single stone, swing the lever around to the required position, and the work was accomplished and the puzzle solved.

But to return to the ruins. Passing around again to the east we enter the acropolis through a rough board gateway, at once plunging into the underground passages under the temple platform. Only a part of them are now open, but Roman inscriptions show that they were at some time occupied by soldiers, and were undoubtedly used as stables. Several hundred feet ahead a glimmer of light gives evidence of the exit on the court side, and on emerging the whole scene of ancient splendour is before the eye. It takes but the magic wand of imagination to fill out the picture. Back of us is the great court, on the right our six white columns, remnants of the Temple of the Sun, and on the left the Temple of Jupiter.

Walking directly east, passing through the great court, and thence through the hexagonal court to the pronaos, the limit of our survey in this direction is attained, for here is the façade of the grand portico of the Temple of the Sun. The broken wall, later built up to insure safety, shows stumps of the twelve columns of the pronaos, and originally a magnificent flight of steps gave entrance to the temple. The measure of this opening shows that the steps were about 150 feet wide, an enormous width, but not out of proportion with the tremendous scale of every part. It is interesting to note an inscription of Roman time on the bases of two of these columns. It was evidently a sort of artistic sop thrown out to the gods for protection, and gives a hint as to the decorative effect of the pronaos. "To the great gods of Heliopolis. For the safety of our Lord Antoninus Pius Felix Augustus and of Julia Augusta, the mother of our lord of the camp, of the senate of the country, Aurelius Antonius Longinus, chief of the First Antonian Legion, of his own free-will caused two brazen capitals of columns to be overlaid with gold at his expense."

The steel tape shows that this porch is 180 feet long by 137 feet deep, including the wings, before which were two Corinthian columns of exquisite detail, with niches and pilasters all around the chamber thereby formed. Statuary must have played an important part of this grand porch, for pedestals are seen on every hand. It would be interesting, indeed, if some of these could be unearthed in order to note their style and value. It is here indeed that we miss our Pausanias.

Three entrances next lead to a court 200 feet across, which, curiously enough, is hexagonal in form, a strange design surely, for the exterior angles do not conform themselves easily to chambers, as they are V-shape and unornamented by sculpture. But the four sides of the hexagon form chapels, as it were, each entered through a porch of four columns, the wall in the rear enriched with corbelled pedestals and niches for statuary.

Three more doorways next give entrance to the great court, and we here see some evidences of Egyptian influence, for on each side are semicircular niches with high stone flanks which are of the same shape and nature as the pylons of Egypt. The great court is totally different from any arrangement that we have seen. No continuous colonnade flanks the sides of the court, but, instead, there are on each side three recessed chapels, two with four columns and one with six columns, and between these chapels are two semicircular niches of exquisite design. The order of these niches is Corinthian, the entablature plain, with highly-enriched cornice, and the huge stones of the shell-like roof are, in many parts, perfect.

Below is a pilastered wall with pedimented niches which undoubtedly contained colossal statues, and it is obvious that the lower part of the wall was enriched with tablets. Traces of a basilica are seen in the centre of this court, and Constantine is named as its builder. Indeed, a huge base with raised platform is still seen, which gives evidence that a sacrificial altar stood there in the old days of paganism, and it was from the centre of this huge court that the smoke of the offering ascended and could be seen from the neighbouring country around.

We stand on this platform and look toward the west. Our six sentinel columns rear their exquisite forms against the blue sky, and the great platform of the Temple of the Sun stretches out with a vastness that is astonishing.

Think of the history that lies beneath those huge stones. For it was here that the great Phœnician Temple of Baal stood, and in its place later came the greatest and most exquisite temple-work of which history gives record. It consisted simply of a rectangular colonnade of fifty-four columns, without a cella. Whether it was ever intended to complete the walls within the colonnade is unknown, but if it was so intended it is strange that no foundation of such a wall can be found. A huge section of the entablature still remains *in situ* and shows what a profusion of ornamentation there must have been in the completed colonnade. The columns are 75 feet high in themselves and the entablature 14 feet higher. The shafts are 7 feet 3 inches in diameter, and the southern side of the colonnade fell outward, so that the huge drums lie like the vertebrae of some huge monster, dismembered but retaining their relative position.

Since the peristyle stood high above the courtyard and some 50 feet above the plain below, the effect from the distance must have been wonderfully impressive. Indeed it is so now.

One can hardly help wondering about the exact ceremonial that took place high up above the plain. Was there some huge stylus centrally located, upon which at a certain hour the rising sun fell and cast its mighty shadow upon the recumbent and reverent body of worshippers? Was there an offering upon the central altar whose fires were kindled daily by the concentrated rays of the sun god, who, rising, caused it to burst into flame and ascend toward the orb which gave it life? Or was there, as at Athens, some colossal statue of a deity standing enthroned in its glory, or through its priests giving out oracles of weal or woe from its capacious interior? The latter idea seems the most probable, as it was an old trick of the gods, known from one end to the other of the pagan priesthood; moreover, remnants of a secret staircase are discernible.

It is impossible to roam around over this area of elevated ground without thinking of the Athenian Acropolis. Here, as at Athens, was a town surrounding this central feature of religious life. In this case the elevated effect was gained partly artificially, while at Athens it was natural. But here, as at Athens, arose before the eyes of the people a grand central lesson, to which their thoughts daily turned, to enriching which their small means went, and to which they looked, in turn, for the favours of the gods. This similarity became the more apparent from the south, where, built up high above the stream below, stand the high walls of the Temple of Jupiter with many of the columns still erect. The temple is larger than the Parthenon, and being in the Corinthian order of architecture is richer, but the distant effect is not unlike that at Athens. It is the best preserved monument of Græco-Roman art in Syria, and is 227 feet long by 117 feet wide.

We climbed around to the east, this being the original entrance, and here, too, are the ruins of a flight of steps seen in a hole of excavation, for the *débris* of ages has filled in around it so that its base cannot be seen. Climbing up on a pile of stone and broken drums a nearer view of the detail is obtained. The entrance must have been of wonderful beauty, for the profusion of ornamentation is here seen in the highest degree of perfection, some say almost to debasement of style; but I do not agree with this view at all, the very style of the Corinthian almost inviting the profusion of detail.

The outer peristyle was upheld by forty-two plain shafts and a rich entablature, but the inner columns of the pronaos were fluted and exceedingly rich. Looking up, it is observed that the soffit between the columns and the cella wall is composed of huge stones divided into hexagonal panels, each one containing a god or goddess enriched amid a mass of sculpture. Thus were the gods depicted as constantly looking down upon the people and noting their very life.

Look at the huge column on the south side; it has fallen bodily against the cella wall, but not even such a shock has served to break the iron-dowelled bond of the drums. The bases of its mates all around lie exposed; enormous stones lie scattered about, and the whole scene is inspiring in the highest degree from its magnitude and beauty of detail.

The entrance portal must have been most beautiful in its perfect state, for its wide architrave, frieze and cornice was a mass of enrichment, and the supporting brackets are well proportioned. It has always been a question how far enrichment

might be carried without detriment, but it seems to me that given the purity of form and proportion of members, purely classical enrichment adds to rather than detracts from the work. This doorway is the best example of this matter, and is here most satisfactorily answered to my mind. The lintel was in three pieces, but the central voussoir being displaced by an earthquake in 1759, it was found necessary later to build a pier under it, which, however, covered up a most interesting carving on the soffit. A photograph taken before the pier was required shows a spirited eagle with outstretched wings, a caduceus in his talons and a garland in his beak, which is held at the ends by genii. What the significance of this enrichment was, if any, I do not know.

The interior of the temple is choked up with *débris* of cornice and column, but the two divisions are marked by a screen with steps entering the sanctuary beyond. The length is 125 feet and the breadth 68 feet.

The dividing screen must have been very beautiful, for on each side was an enormous slab with figures in alto-rilievo, which told of the sacrificial processions that undoubtedly took place from within its walls. Back of the slabs were massive enriched pillars and from the *débris* it seems to show that an arch sprang from the pillars.

Before entering the sanctuary, however, note that the side walls of the temple were formed by engaged columns of the Corinthian order, between which were niches with pedimented hoods, under which are the bases for statues. Again it is shown how large a place sculpture occupied in the minds of these builders, and one longs to know more in regard to their characters.

Return now to the entrance and people the sanctuary in the rear with the crowning feature of this temple. It could have been no other than the colossal statue of Jupiter, for it was here that the people assembled to consult the oracle and receive the response of the god. As in the Temple of Isis at Pompeii, a secret stair led to the interior of the image, and it was from the lips of the statue that the priests spoke. This passage is still seen. That this fact was known to the people, however, is not at all sure, for the priests acted upon the supposition that the gods spoke through them, and undoubtedly so taught the people. Herodotus remarks that, "These priests assert, though I cannot credit what they say that the god himself comes to the temple and reclines on a bed, in the same manner as the Egyptians say happens at Thebes in Egypt; in the same way, also, the priestess who utters the oracles at Pataræ in Lycia, when the god is there is shut up during the night in the temple with the god."

But at any rate we have only to build up once more in our minds these broken walls, fill the niches with statues, and rear the colossal god in his sanctuary; then approach with the multitude, and we can better understand the enthusiasm of the people, who, resting their faith upon the promises of the gods, saw the incense ascend from the altar, and heard the voice from the sacred shroud of smoke. The decision of fate was accepted, and the destiny of a nation oftentimes hung upon its interpretation.

We leave the temple enclosure, retrace our steps through the passages of the great court, and are soon at the hotel once more. The sun has set, the moon has risen from over the long range of distant mountains, and as we look from the windows once more, the six white sentinel columns stand out from their soft background and rear their heads heavenward.

GLASGOW ARCHITECTURAL ASSOCIATION.

AT a meeting of this Association, held on Tuesday evening in the rooms of the Philosophical Society, 207 Bath Street—Mr. A. N. Paterson, president, in the chair—Mr. S. Herbert Capper, architect, Edinburgh, delivered a lecture on "The Monks and their Abbeys in Olden Days." At the outset Mr. Capper spoke of the difference between the monastic life of the East with its rigid asceticism, and that of the West, where the monks lived together for a common end. When the Benedictines fell away from a strict observance of their early rule, the lecturer pointed out how a reformation towards more primitive austerity was begun at Cîteaux by Robert, of Champagne, and was continued and spread by St. Bernard, of Clairvaux. The Cistercian order, to which St. Bernard belonged, also became popular all over Europe, and was especially so in this country. In the Cistercian monastery the lay brother played an important part, and Mr. Capper explained how his appearance there modified the architectural conditions of the abbey buildings. By the aid of limelight a large number of typical examples of Benedictine and Cistercian, abbeys, and churches were thrown upon the screen and their points of difference explained. Views were likewise shown of cloisters, kitchens, refectories, &c., and of the internal arrangements of the churches and cloistral buildings. There was a crowded audience, who followed the lecture with the greatest interest. On the motion of Mr. Wm. Connes, vice-president, a vote of thanks was cordially given to the lecturer.



Memorial to the Late Rev. John Foy.

SIR,—It is proposed to erect over the grave of the late Rev. John Foy a plain but suitable marble cross, and if possible at least a memorial tablet in the church of St. Thomas of Canterbury, at St. Leonards-on-Sea, of which mission he was for thirty-five years the esteemed rector. To perpetuate this, and also to record his indefatigable labours and kindness of heart, it has been decided by some friends of the late rev. Father, with the approbation of the Rev. Fr. Ottley (the present rector), to appeal for funds to carry out the above proposed memorial. Subscriptions will be received by Mr. J. Klee, Audley House, 17 Church Road, St. Leonards-on-Sea; or to yours obediently
E. BONIFACE.

43 Southwater Road, St. Leonards-on-Sea:
January 21, 1895.

GENERAL.

The Late Earl of Orford has bequeathed a portrait of James Stuart, the Pretender, by Largilliere, to the National Portrait Gallery.

Alderman Bell on Tuesday laid the foundation-stone of the new building for the Commissioners of Sewers. The plans were prepared by the late Colonel Haywood. Messrs. Chessum & Sons are the contractors, their tender being 32,266*l*.

M. Natalis Rondot, of Lyons, has been elected a corresponding member of the Académie des Beaux-Arts, in succession to the late Sir Charles Newton.

Mr. Walter Gay, the American painter, has been nominated a Chevalier of the Legion of Honour.

A Design by Mr. W. L. Carruthers, architect, has been selected for the new church in the Barnhill district of Inverness. The church will accommodate 400, and will cost about 2,000*l*.

Subscriptions amounting to 300*l*., from a number of Scotch Presbyterians in Australia, have been sent to the Rev. Dr. Cameron Lees towards placing a memorial to John Knox in St. Giles's Cathedral, Edinburgh.

Dr. F. J. Waldo, medical officer of health of St. George's, Southwark, and of the Inner and Middle Temple, has been appointed tutor in public health to St. Bartholomew's.

The Dublin Arts Club Exhibition was formally opened on Monday afternoon by the Lord-Lieutenant.

Mr. A. Marshall M'Kenzie, A.R.S.A., has designed a pulpit for the new Crathie Church. It is being erected in different kinds of Scotch granite, and Princess Louise has sent a collection of Scottish pebbles and marbles for the ornamentation of the pulpit, collected by her on the island of Iona.

The Cambrian Archæological Society have been invited to hold their next annual gathering in Cornwall.

Mr. T. W. Baker, of Oakfield House, Balsall Heath, has been appointed architect for the proposed extension of the Warwickshire County cricket pavilion.

Lord Mount-Edgcumbe, as Lord-Lieutenant of Cornwall, will on Monday, February 4, present the testimonial to Mr. Silvanus Trevail, mayor of Truro, for which subscriptions have been given in recognition of important public services.

The Society of Cardiff Architects meet at 3 P.M. this afternoon for the purpose of considering the desirability of drawing up a memorial to be presented to the Corporation, with a view to asking that body to have an open competition among the architects of the county borough of Cardiff for the proposed new museum and art gallery in Park Place.

Mr. A. M'Gibbon, architect, on Tuesday delivered a lecture in the Glasgow Corporation Art Galleries on "The Design and Arrangement of the Mediæval Church."

Messrs. Baker & Sons have sold by auction ground-rents amounting to 400*l*. per annum secured on ninety-eight small houses and shops at Peckham, Camberwell, Dulwich and Clapham, which realised 12,000*l*., being an average of thirty years' purchase.

Mr. Charles Bartholomew, C.E., died at his residence at Ealing on the 12th inst. in his eighty-ninth year. In early life he was engaged in constructing a portion of the Aire and Calder Navigation. Subsequently he was employed in railway work and became engineer in chief of the River Don Navigation and South Yorkshire Railway, of which combined enterprises he was subsequently a director. He also took part in opening up the coalfield of South Yorkshire, and to the time of his death actively participated in the management of the collieries with which he was connected.

The Architect.

THE WEEK.

THE last circular issued by the Science and Art Department may instigate a reform in the science schools, for what is proposed is a stoppage of the cramming which has made the schools, or rather, the teachers and students, ridiculous. Every year examiners like Professor HUXLEY have protested against the system, but in vain. As long as payment on results prevailed there could not be a change. In theory the principle appeared satisfactory to the British mind, but when manipulated as it was by officers of all grades, it merely aided in producing a mockery of science. It is now proposed that payment by results is to come to an end in May, and will be superseded by payment on inspection. There are now competent inspectors, and Mr. ACLAND considers that with their aid he can make the change. The rule will apply to about 120 science schools. It remains to be seen whether the new system can be loyally carried out. It may not at first bring any increased emoluments to the teachers, and the compilers of the departmental returns will not be able to expatiate about the amazing increase in the number of trained students in science which are turned out in the classes. But if instead of a sham success there is a little genuine knowledge extended among the people, the country will not be a loser.

A SPECIAL meeting of the Cardiff, South Wales and Monmouthshire Architects' Society was held on Friday afternoon in Cardiff, for the purpose of considering the question of throwing open to competition the plans for the new museum and art gallery. It was unanimously resolved that the following memorial be sent to the Cardiff museum committee:—"That the Cardiff, South Wales and Monmouthshire Architects' Society memorialise the Cardiff museum committee to the following effect:—That unless they have already pledged themselves to any architect, they should invite a public competition for designs for the new museum buildings proposed to be erected in Park Place, the competition to be under the rules of the Royal Institute of British Architects." It was stated that Mr. EDWIN SEWARD, a member of the Society, claimed to have been already retained as architect by the museum committee.

THE following declaration of the status of an architect was adopted at a meeting of the Royal Institute of Architects of Ireland on Saturday:—(1) The present well-defined legal relation of the architect to the employer is that of servant, agent and adviser; and to the builder of arbiter between him and the employer. The position of the architect confers on him no claim to dictate as to his employer's expenditure, nor as to the materials, workmanship, or manufactured goods he elects to spend his money on. The architect's privileges are limited to persuasion and protest against anything injudicious which might be credited to the architect by the general public. An architect, in his fiduciary capacity, who, for any private motive whatever, permits materials or workmanship or goods of any kind to be charged against his employer, without his special consent, at a higher cost than the like could have been obtained for elsewhere in open market, commits a grave breach of trust. (2) The relations of the architect to the contractor are limited to insistence on good and sound work, and that all goods supplied are up to contract standard, and that the contractor is justly paid, and the work finished up to time. It is not open to the architect to concern himself with the economic management of the contractor's business, on the profits of which he lives, nor to control his purchases or relations between him and his men. The discussion by architects with outside persons on such matters as lie within the liberty of action of employer or contractor is an impropriety. (3) The foundation principle of this Institute is the advancement of architecture in Ireland. While it is daily more incumbent on every Irish architect, in view of the extraordinary development of architecture and building resources, to acquaint himself by travel and diligent study with newest inventions,

construction and materials, so as to keep architecture in Ireland abreast of its progress in other countries, the unanimous preference of Irish architects is for workmen and products of Ireland, and to employ them within their rights, limited as before defined. It should further be the policy of Irish architects to introduce to Ireland all newest ideas of construction, building appliances and materials, and make them known, and to encourage the development of native product of all such novelties or improvements, with superiority if possible. It is desirable that the Institute should resume its functions, somewhat neglected, of professional discussion, &c., of all economic questions affecting the progress of architecture, and that it should invite from master builders, tradesmen, manufacturers and others interested in architecture, communications in writing on debatable questions which have not a personal tendency; and that the deliberate opinion of the body of architects on controverted subjects should be published in the Press.

THE new building of the Royal United Service Institution, which adjoins INIGO JONES's banqueting-hall, is now ready for opening. The building is constructed of brick, Portland stone and granite, and is fireproof both in roof and floors. The principal or western front is towards Whitehall, but it has also an elevation facing Whitehall Gardens, on which the lecture theatre abuts. The heavy exhibits are housed in the crypt, while the arms, armour and models are arranged in the upper hall. The staircases are adorned by trophies of arms. At the levels of the lower gallery of the hall and of the upper galleries sliding doors of communication connect the old building with the new one, which comprises, on the first floor, an entrance-hall, porter's-room, service stair and passenger lift to the principal floors, clerks' office and lavatories for members, staircase hall, a large lecture theatre capable of seating nearly 400, and a lecturer's-room. The theatre has a separate exit towards Whitehall Gardens. On the main floor, at the level of the banqueting-hall, there are, facing Whitehall, a council-room and secretary's room with loggia, overlooking the theatre. On the first floor there is a large newspaper-room, running the whole length of the Whitehall front, and reference library over the theatre, with accommodation for about 30,000 books, and librarian's room adjoining. On the second floor, at the level of the banqueting-hall gallery, there is a large waiting-room over the newspaper-room, and the staircase hall on this floor opens into the gallery of the reference library. On the top floor is a large topographical room and also caretaker's quarters. In the basement is the boiler-room, from which the building is warmed with hot water, and storage cellars of various kinds. The architects are Messrs. ASTON WEBB & E. INGRESS BELL. It is estimated that the cost of the new buildings and of preparing the banqueting-hall and crypt for the museum will be about 25,000/.

A MEETING of the consultative council of the Building Trades Exhibition was held at the offices of the exhibition, 222 Strand, W.C., on Wednesday, the 30th ult., Professor BANISTER FLETCHER in the chair. There were also present Messrs. E. W. MOUNTFORD, T. LOCKE-WORTHINGTON, H. H. COLLINS, GILBERT WOOD, H. GREVILLE MONTGOMERY, G. M. CALLENDER and T. FREEMAN, hon. sec. It was resolved that popular lectures should be given by architects and others as last year, upon subjects of interest to the manufacturer, and that the competitions in handicraft by workmen in all branches of the trade should be continued and still further developed. It was suggested that various experiments in the crushing strain of materials should take place, and that the Council should take upon themselves to make tests of such materials as exhibitors should care to submit to them. The affairs of the exhibition were stated to be in a very flourishing condition, the number and variety of exhibitors already far exceeding those of many years past.

FEW men were more closely associated with archæology in Lancashire than Mr. JOHN PARSONS EARWAKER, who died on Wednesday. He was born in Manchester in 1847. His most important work was the superintending of the reproduction of the records of the Court Leet of Manchester, which was entrusted to him by the Corporation.

DOMESDAY BOOK AND HOUSES.

A GREAT change has taken place in the manner of judging the famous Survey or inventory which was ordered by WILLIAM THE CONQUEROR. It is no longer supposed to have been an inquisitionary document which would enable the strangers to exact an undue share of the property of the natives. The Survey was inspired by a desire to insure the equitable taxation of Englishmen as well as to bring in such a revenue to WILLIAM as would be beyond the dreams of avarice. The account which LINGARD gives of the origin of the Survey, although very brief, is sufficiently correct to be quoted:—

It could not be supposed that the Normans in the provinces, foreigners as they were, and indebted for their possessions to the sword, would respect customs which they deemed barbarous, when they thought them prejudicial to their interests. But while they tyrannised over the natives, they often defrauded the Crown of its ancient rights, and the king, treading perhaps in the footsteps of the great Alfred, to put an end to all uncertainty ordered an exact survey to be made of every hide of land in the kingdom. Commissioners were sent into the counties, with authority to empanel a jury in each hundred, from whose presentments and verdicts the necessary information might be obtained. They directed their inquiries to every interesting particular, the extent of each estate, its division into arable land, pasture, meadow and wood, the names of the owner, tenants and sub-tenants, the number of the inhabitants and their condition, whether it was free or servile; the nature and the obligations of the tenure, the estimated value before and since the Conquest, and the amount of the land tax paid at each of these periods. The returns were transmitted to a board sitting at Winchester, by which they were arranged in order and placed upon record.

It was the policy of WILLIAM to make as few changes as possible in the Saxon laws, and in the survey for Domesday a similar respect was shown for ancient arrangements. There are in it no novel divisions of England or of its inhabitants. Shires (which were not always counties) and boroughs, hundreds, tythings or decennaries, wapentakes and wards are employed just as they were in the time of EDWARD THE CONFESSOR. The feudal distinctions between freemen, foreigners, strangers and villeins are recognised. The tenures are mentioned and the obligations they imposed. Domesday Book is, therefore, not a memorial of Norman innovations, but a record of what had survived after many centuries of regular government, and which helped to distinguish England from the rest of the world.

The Survey was accordingly of much more importance in the eleventh century than a general collection of the poor law union assessments, which are the nearest approach to it, would be in our time. The two volumes suggested to WILLIAM and his councillors what guarantees existed for the preservation of order. We should remember that in Saxon England an effective, if primitive, method was adopted which enabled the rulers to dispense with a police force. The reeve, sheriff or præpositus was an influential officer in preserving the public peace, but the main part of his business was to see that every man within his jurisdiction was, as it were, bound over not only to keep the peace himself, but was part surety for the keeping of it by his neighbours. A foreigner could not enter the country unless one or more freemen became responsible for him. A man could not leave his own shire or lordship without authority. That restriction was relaxed in course of time, but that it prevailed when the Survey was in progress is shown by the occasional entry, "he may go where he will," as an indication of the possession of a privilege which was worth attention.

The great ALFRED, when he ordered the Survey to which DR. LINGARD refers, divided England into counties, hundreds and tythings. A tything or tenth was the origin of our word town, for, says FINCH, "A town is a precinct anciently containing ten families, whereupon in some countries they are called 'tythings,' within one of which tythings every man must be dwelling, and find sureties for his good behaviour, else he that taketh him into his house is to be accused on the Leet." HENRY, following what is said by WILKINS in the "*Leges Saxonice*," affirms also that "All the members of each decennary were mutual pledges for each other's obedience to the laws, and answerable with some equitable restrictions for their disobedience. Whoever was not a member of some decennary was considered as a vagabond who could claim no protection or benefit from the laws of the country." Domesday accord-

ingly enabled the authorities to realise to what extent the tythings or towns were an obstacle to the increase of the "Vagrant Lackalls" which continue to be one of the miseries of England. The tythings were no less serviceable to the Normans in preventing the hatching of conspiracies. The Survey enabled the invaders to estimate the strength and weakness of their position, and that so great an undertaking was accomplished in the short space of four years testifies, as CARLYLE says, what kind of under-secretaries and officials WILLIAM appointed — "silent officials and secretaries, not wasting themselves on parliamentary talk; reserving all their intelligence for the silent survey of the huge dumb fact, silent consideration how they might compass the mastery of that."

To consider the references to the houses throughout the Survey would be a stupendous task: we must limit ourselves to a few of those which are found in the returns from the boroughs. In the first place, it is to be regretted that the system of classification which must have been prepared for the use of the surveyors is unknown. It is impossible to say how the collection of low, irregular buildings, court-yards and enclosures of CEDRIC the Saxon, of which we read in "*Ivanhoe*," would be described. There are entries in Domesday which must puzzle a modern valuer or assessor. We find, for instance, that in Nottingham ROGER DE BUSLI paid 4s. 7d. on account of three mansions, which contained eleven houses. Were the latter chambers? In the same town RADULPH, the son of HUBERT, is said to have eleven houses, in which three merchants dwell. It might be concluded that the three merchants were tenants or sub-tenants for the eleven, but it is not improbable, according to modern notions, that they occupied no more than three shops, and that the remainder of the property was let to knights. For in the same folio we read of WILLIAM PEVREL having twelve houses of knights and forty-eight of merchants, while RALF DE BURUN held thirteen houses of knights, and in one of them a merchant lived. In all ages merchants were important agents in upholding society, and at a later time they became the most influential of the inhabitants of towns. But the especial way in which they are designated in Domesday suggests that they were assumed to be either foreigners or pedlars, and therefore it was well to keep a watch on them. Whatever was the cause they do not appear to be included among the burgesses. We also find distinctions between houses and halls. Thus, in Lincoln, the hall of one individual is free from all customs or dues, whereas another, it is noted, has a house without a hall and pays dues. In that city a burgess possessed the privilege of selling his house and removing elsewhere. But the disposal of interest in property and especially land was no easy undertaking. Small proprietors were puzzles to the officials. It is recorded with amazement that in the vill of Bideham, in Bedford, one GODWIN held half a hide of land which "he was able to give to whom he willed." Another burgess, named ORDU, could dispose of half a hide and the fourth part of a yardland, and ULMARUS could give two parts of a yardland. Bedford evidently was undisciplined, and must have given trouble to the surveyors.

As the people were held to be responsible for the good conduct of their neighbours, they were also compelled to be no less careful in looking after houses. Every building was of importance in the eyes of the State, and it was unlucky for those who allowed fire to approach one. In the survey of Shrewsbury it is stated that if the house of a burgess should be burnt by any accident or event, although there was no negligence, he was to forfeit forty shillings to the king and two shillings to each of the adjoining neighbours. It was accordingly the interest of every burgess to aid in preventing fires from spreading, for a few sparks might ignite other houses, and the tenants were fined in addition to their losses. In Chester, the rule was that the man who owned the house in which the fire commenced should pay three ores of money and three shillings to his nearest neighbours.

The king's highway had, in those days, a signification which we cannot understand. Interference with it was a serious offence. We can imagine it brought about much inconvenience to a culprit, for it is recorded among the customs of Canterbury that if a man were to dig a

trench or set up a paling without authority, the king's reeve was to pursue him whithersoever he fled, and obtain from him satisfaction for the king. It was probably owing to the stringency of the regulations concerning public ways in boroughs that so many of the inhabitants were induced to set up their residences in the ditch near the walls. A lawsuit in the time of EDWARD I. is evidence that several were then existing in the Canterbury ditch, but it was not unhealthy, for it was said to be 150 feet in width. There were also houses in the ditches at York and Nottingham. It is possible the houses belonged to people who were connected in some way with the defence or reparation of the walls or ramparts. The Survey records that in Oxford the king possessed twenty mural mansions, which were free from all dues except work on the wall. It is stated that if the holder of the house neglected the work, he must either pay a fine of forty shillings to the king or forfeit his house.

There were various other obligations. In Hereford a tenant was to pay $7\frac{1}{2}d.$ and $4d.$ towards hire of horses, to give four days' help in mowing and one day in gathering the hay, if the sheriff ordered. If he possessed a horse he was to accompany the sheriff three times a year, and whenever the king went a-hunting a man from every house was to stand in the wood. Six smiths were allowed in the city; each paid a penny rent for his forge. Each was to make 120 nails from iron supplied, for which they received three-pence. The seven moneyers of Hereford (one was an episcopal officer) gave each eighteen shillings for the coinage die, and twenty shillings a month for the privilege. They were obliged to coin as much money as the king required when he came to Hereford, and they followed the sheriff in expeditions to Wales. If any of them was afraid to go, he was fined forty shillings. Many other customs prevailed by which services were accepted in lieu of rent.

There is a statement of INGULF that ORDERIC confirms, which shows that WILLIAM's commissioners were often deceived. We cannot credit that the number of houses given as waste or unprofitable was correct. The coming of the Normans could not have given an extraordinary impulse to speculative building, yet in almost every town many houses are returned as useless. In York there are 50 inhabited mansions, 400 uninhabited, and 540 from which no money can be derived. There were also broken-down burgesses, or "burgensēs minores," who generally escaped with the moderate tax of a penny a year. In spite of all the deductions and evasions, WILLIAM could not complain of his incomings. If his ambition was to become the wealthiest of European monarchs, he succeeded. It was calculated by one of his contemporaries that his revenue amounted to 1,061*l.* 10*s.* 1*½d.* per day, and the equivalent of that sum in current coin appears so incredible, there is always some hesitation in announcing it.

The money question is undoubtedly of primary importance in Domesday Book, and is continually asserting itself. For example, the phrase "a guildhall of burgesses" very often occurs in the folios. Imagination need not picture those places as picturesque buildings in which stout burghers debated. They were only the offices where the tax collectors were to be found. "Guildan" then meant paying, not a guild, a municipal corporation or a body of craftsmen or devotees; and WILLIAM and his officials were eager to be assured that no inhabitant could plead ignorance of the place where he was to pay all his dues to the State, which, in most instances, included rent, or be able to complain of having to trudge a long distance to reach the collector.

There was no part of England from whence WILLIAM was likely to derive more money than from London. Yet in the whole of Domesday there is no return relating to it. Sir HENRY ELLIS suggested that the reason of the omission was that, prior to the Survey, London was graced with peculiar and extensive privileges, and if so it could not come under the same sort of classification as other towns. Winchester also was excluded, but it is known there was a separate Domesday for that city called the "Book of Winton." There may have been also a London Domesday which no longer exists. The absence of the record deprives us of information concerning the houses which were the most interesting in the country.

THE BRIDGEWATER GALLERY.

IT may be assumed that when a winter exhibition of works by old masters is opened, the first question with many amateurs is whether any pictures from Bridgewater House have been secured? It seems unaccountable that year after year one of the very few great collections in London should be kept intact, in spite of all the entreaties of the Academicians, and one, too, which is so close to Burlington House as to remove any apprehension about the safety of pictures while on the way to an exhibition. The great obstacle to the appearance of any of the examples on the walls of the Academy is a clause in one of the deeds which prohibits the removal of any of the pictures from the galleries for even a brief period. It is true that in 1857 there was apparently a departure from the prescribed rule, for about half a dozen of the pictures were exhibited at Manchester, but we suppose the exceptional liberality arose out of the intimate connection of the BRIDGEWATER family with Lancashire, and, moreover, the pictures in question, which were not the most valuable in the collection, may have been acquired under circumstances which would allow them to be gazed on by the public without diminution of their interest.

The most valuable part of the Bridgewater collection was acquired on terms the recollection of which must always excite envy in the minds of amateurs. The pictures we refer to belonged to the Orleans or Palais Royal collection. They had become the property of PHILIPPE D'EGALITÉ. To serve his own interests, he was stirring up disaffection in France, and under the guise of patriotism was plotting against LOUIS XVI. Money was needed for his agents, and, as he was indifferent to art, it was no sacrifice to sell the pictures he had inherited. They were gathered by the Duke of ORLEANS, who was Regent of France during the minority of LOUIS XV. For twenty years he employed agents throughout Europe to acquire masterpieces for him. In that way he was able to secure the pictures which belonged to CHRISTINA of Sweden, the Cardinals RICHELIEU and MAZARIN, the Duc de GRAMMONT and others, amounting altogether to 485 works. The majority were paintings by Italian masters, and VOLTAIRE refers to the Regent's collection as being one of the causes which gave a tendency to French taste. Some of the pictures were displeasing to the Regent's son, or rather to the moralists who surrounded him, and were ordered to be destroyed, but with all deductions the collection, when it passed into the possession of PHILIPPE D'EGALITÉ, was worthy of any king's gallery. Owing to the need to obtain money the pictures were sacrificed. The German, Flemish and Dutch examples were sold to THOMAS MOORE SLADE, representing an English syndicate, for 350,000 francs; a banker from Brussels secured the Italian and French pictures for 750,000 francs, but becoming apprehensive resold them for 900,000 francs to LABORDE DE MEREVILLE, who wisely despatched them to London. BRYAN, the author of the "Dictionary of Painters," saw them, and persuaded the Duke of BRIDGEWATER to invest 42,000*l.* in purchasing the three hundred and five paintings. Afterwards BRYAN made a valuation in detail, which worked out to 72,000*l.* The Duke retained ninety-four. He allowed his nephew (afterwards Marquis of STAFFORD) to purchase one-fourth of the selected number, and conferred a similar favour on Lord CARLISLE. The duke's share of forty-seven pictures, at BRYAN's prices, would cost him 42,313*l.* The two quarter shares amounted to 21,300*l.* The remaining pictures were offered for sale at an exhibition which was held in the Lyceum in the Strand. On the first day Mr. ANGERSTEIN gave 3,500 guineas for the *Raising of Lazarus*, which is now in the National Gallery. During the time the exhibition was open pictures to the value of 33,544*l.* were sold. The sums paid for admission amounted to 7,500*l.* The surplus works were sold by auction and realised 4,273*l.* It will thus be seen that after reserving ninety-four works which were the most valuable, a sum of 45,317*l.* was derived out of the remainder. In other words, the duke and his two privileged friends were enabled to obtain the pictures most admired by them without any expense. It is commonly said they paid about 2,000 guineas for their good fortune, but the supposition is only a concession to the commercial spirit of the country, which prefers a debit and credit to a one-sided account.

The forty-seven pictures from the Orleans galleries were added to those possessed by the Duke of BRIDGEWATER, and a great many others were afterwards purchased. The collection is therefore considered by some authorities to be the most valuable in England. But the market value of paintings, and especially those belonging to the Italian school, is so uncertain, it is difficult to say what price would be obtained for the pictures if, let us suppose, they were brought into the market in order to obtain money to advance the prosperity of the Manchester Canal. Four pictures by RAPHAEL, five by TITIAN, with the examples by CLAUDE, REMBRANDT, CUYP, TENIERS, BERGHEM, if those by the CARACCI, N. POUSSIN and GUIDO were out of favour, would attract competitors from all parts of the world.

There is, however, degradation for it when the worth of a picture is determined by a dealer's standard. The majority of the pieces in Bridgewater House are to be prized for other reasons. The large *St. Gregory attended by Angels*, which was painted for the Monastery of San Gregorio in Rome by ANNIBALE CARACCI, has an interest for all who find a pleasure in smuggling. It was among the spoils which were destined for the Louvre, but somehow an Englishman and an Italian became joint proprietors of the altar-piece. It was concealed in the cellar of a house. A rule was made that every painting which was to be sent from Rome should be scrutinised in the presence of a cardinal, and stamped by him. To evade the rule a scheme was arranged. An artist was obtained to paint a distemper copy of GUIDO'S *St. Michael* over CARACCI'S work. Then an Englishman was discovered to whose lodgings the dual painting was sent. He represented to the cardinal that he had purchased a copy of the *St. Michael*, but as it could not be easily removed he would be grateful if the examination could be gone through at his lodging. The cardinal was willing to oblige all Englishmen, and agreed to the proposal. He imagined he was dealing with a gentleman. By that dodge the picture was allowed to be taken from Rome. It reached England in 1801, and found its way to a place among the Duke of BRIDGEWATER'S Italian works. The annals of most collections are full of similar stories, but whether they are creditable to the men who were the actors is another question.

It is not the only picture with a history. The *Cupid* by PARMIGIANO was originally painted for the Chevalier BAYARD. RAPHAEL'S circular *La Vierge au Palmier*, one of his earlier works, was inherited by two sisters, who preferred to break the panel in two and each to possess a fragment rather than agree to possess it by turns. The picture must have been injured in the operation, for the late Sir A. H. LAYARD considered that the figure of St. JOSEPH was the work of an inferior hand or was entirely painted over. The *Madonna del Passeggio* was presented to PHILIP II. of Spain by the Duke of URBINO. It found its way to Prague, from whence it was carried off to Sweden by GUSTAVUS ADOLPHUS. Queen CHRISTINA bequeathed it to one of her favourites, who sold it to an Italian prince. Next it passed to the Duke of ORLEANS, and eventually to Cleveland Row. POUSSIN'S series illustrating the seven sacraments was purchased by the Duke of ORLEANS for 120,000 francs. BRYAN'S valuation of them was 4,900! REYNOLDS considered them to be typical of POUSSIN'S later manner, which was much softer and richer than his earlier and drier style, and as showing more union between the figures and the ground.

The examples by TITIAN justify VASARI'S epithets, *Judicioso, bello, e stupendo!* The *Diana and Calisto* and *Diana and Actæon* were completed in the master's eighty-second year, and are marvellous in the skill with which figures and background are combined in colour effects. At one time it was supposed the two were painted for HENRY VIII., and that they belonged to CHARLES I. HAZLITT says that in them, "tone, not form, predominates; there is not a distinct line in the pictures, but a gusto, a rich taste of colours is left upon the eye, as if it were the palate." The *Venus à la Coquille* is not a goddess according to the Greek type, but what is seen of the form is beautiful, and the sea in which she stands is of a blue which is only visible in the south. The *Four Ages*, like the *Sacred and Profane Love*, is one of TITIAN'S enigmas which are as obscure as any of DÜRER'S. GUIDO'S *Assumption* is one of

his great works, and ROMANO'S *Infancy of Hercules* is superior to any example of the master in England.

It is a pity that so many noble examples of the Italian school are not to be seen and studied, if it were only by instalments. The Flemish and Dutch pictures are also valuable. If artists, students and amateurs were enabled to realise the importance of the BRIDGEWATER collection, and were to urge the advantages which would arise if the pictures were allowed to become as visible as those in other private galleries, their desires might be granted. English law courts are powerful, and of late years a rational interpretation has been taken of many deeds which, when considered literally, were exacting in their precautions. If the documents which create a trust in the pictures in Bridgewater House were examined in the modern judicial spirit, they also might be found to be serviceable to the community.

THE STUDY OF MÆDIEVAL DOMESTIC ARCHITECTURE.*

THE most neglected phase of Mediæval archæology is that which relates to the dwelling. Architectural histories are scarcely better, down to the time of the Renaissance, than histories of religious architecture. With the Renaissance, the dwelling-house in its many forms assumed so important an aspect that it has been absolutely necessary for our historians to give some attention to it. But for the time previous to the Renaissance little has been done. Of English books there is almost less than nothing in the way of literature. Fergusson, who, notwithstanding his many obvious faults, has produced the most considerable history of architecture in England, refers to the quantity of ancient domestic architecture, especially that in France, but makes no use of it. Von Reber, in his admirable handbooks, scarcely does more than mention domestic architecture by name, while Mr. Moore, an American writer, does not refer to this phase of architecture at all in his work so broadly titled "Character and Development of Gothic Architecture." Certain phases of ancient domestic architecture in England have been well studied and published, and there is, perhaps, little to be done in that country, save in the direction of publishing further detail.

But it is not altogether correct to say that nothing has been done; a good deal has been accomplished, and is being accomplished, which is important to remember, but as yet there has been no general survey of the whole field of domestic architecture from the earliest times down to the end of the last century. My object in the present note—for it is much too fragmentary to deserve the name of paper—is simply to direct attention to this somewhat neglected phase of architectural history and to suggest one or two plans for work in it.

Personally, I have no actual acquaintance with ancient domestic architecture outside France, and I am therefore chiefly concerned with that country. Last summer I visited many out of the way places in France, and was quite unprepared for the enormous number of houses of all sorts that I met with in my wanderings. Not all of these were of historical value; many of them were without special artistic or picturesque value, though their general effect, when seen up narrow streets or in small bits, was intensely picturesque; a good deal has been injured by restorations, by rebuildings and by repairs, until sometimes only a window-frame or a huge column remains to tell or to suggest what the original structure was like. By far the larger part of these ancient buildings are unstudied and unknown. Even the photographic series of the Commission of Historical Monuments contain but a few of them.

For example, the new catalogue of M. Robert, the official photographer to the Commission, which has just been published, contains but seven photographs of the old buildings of the town of Montferrand, and two of these are details of whole structures included in the other photographs. This town of Montferrand, which is not inaccessible at all, being reached in a few minutes by electric railway from Clermont, is full of old houses, scarcely any buildings of importance having been erected there since the sixteenth century. I do not wish to hint that all its structures are of great interest; many of them are not, but several are very important, with interesting courts, and which well deserve attentive study. Of Sarlat, which is one of the most picturesque and strange towns in France, in some respects the most striking place I have seen, M. Robert offers but four photographs, though I am sure he could have gathered forty easier than the trouble it must have been to have picked out the four. Of Mirepoix, M. Robert has but one photograph, and while that, fortunately enough, is the most striking and interesting house in the town, there are many others interesting, perhaps more singular than interesting,

* A paper read before the Archaeological Institute of America by Mr. Berr Ferree.

and the great square of the city is certainly one of the most remarkable in Europe. And I might take up fifty towns and make the same report on them; scarcely a village in France that does not contain some type of ancient house architecture of more or less interest. And while speaking of the subject of photographs, it may be well to mention that almost nothing is done by local photographers. In some few localities where there are well-known curiosities that are visited by occasional tourists, small photographs can be had of scarce more value than the simplest souvenirs. Anything like adequate photographing by local photographers is quite unknown.

It is entirely natural that France, and, indeed, all the less visited and therefore less changed parts of the Continent, should abound in examples of ancient domestic architecture. For a single church there would be, and is, a hundred or more houses. So far as volume goes, there is no comparison between ecclesiastical and domestic architecture, though the quality is necessarily different. Houses, as works of art, do not approach churches in this respect, and in those attempted histories of architecture in which the study of form is made the dominant question, it is perhaps natural that the more ornamental structures should receive more attention than the more useful though the less ornate. Still, though the reason for this difference in treatment is apparent enough, there is no reason why, in this enlightened epoch, when everything that throws light on the development of human culture is eagerly studied and investigated, we should continue to close our eyes to the quantity of domestic architecture that has come down from previous times.

Obviously the circumstance that many of these dwellings have been repaired almost beyond recognition, that many of them are still inhabited, that many of them have lost their real artistic interest, has had much to do with the neglect with which they have been treated. The traveller who goes among them needs no imagination to reproduce the life of the Middle Ages, save the costume of the people. Climb the hill of Le Puy to its strange cathedral, and in its vertical streets one can almost smell the thirteenth century. Walk along the streets of Tulle and of Sarlat, and you can feel the intense cold dampness oozing out of the houses as it has oozed for hundreds of years. Go into Sisteron and see the narrow, ugly alleys, arched over until, in broad daylight, one has almost to feel one's way, and you will realise what life in the Middle Ages must have been so far as the dwelling-house was concerned.

But I am not arguing for a revivification of the Middle Ages; all I wish to do is to point out this neglected phase of archaeological study and to hint at its exceeding richness. I have already referred to the relatively slight attempts to perpetuate this work in the photographs of the Commission of Historical Monuments. What has been done otherwise?

In some respects, a good deal. That is to say, French archaeological literature contains a good number of monographs on Mediaeval houses of one form or another. But these are mostly important houses. Now this is not what I suggest studying at all, but the unimportant ones, and I am sure the student who ventures into this field will have rich returns for his labours. But these monographs are scattered through the many publications of the French archaeological societies, which we in America scarcely see at all and which even in France are not well circulated. And, furthermore, these studies are undertaken without any special reference to system, to locality, to bearing upon other studies, or even to the history of domestic architecture as a whole. The great desideratum is systematic study on an extended scale.

My chief suggestion is briefly this. Nearly all the more important cities of the French Departments have an archaeological society, whose special purpose is the study of the archaeology of its immediate vicinity. Now, if these societies were to divide up France into a series of districts for the study of its domestic architecture, if each would take its own neighbourhood, and institute or encourage extended study of its domestic monuments, it would be possible, with systematic and organised work, to accomplish a vast deal in a few years, even though each society only took up a few buildings at a time. Most of these organisations publish bulletins or memoirs, and it would add no greater cost to their expenditures to publish reports on these buildings, and thus make common property to the whole world of a rich field of study whose value they as yet scarcely know themselves. Such work should include, first of all, photographing the building in every important aspect, or in any aspect which could, in any way, be considered important or useful. Even if these photographs were never published, the fact that somewhere they could be found, and that negatives were in existence, would be something of value. Important dwellings should be measured and be carefully drawn to scale; and all, important or not, should have their plans drawn. Wherever possible, life histories should be collected—that is to say, repairs, alterations and changes noted, and an actual record made of their present condition. Photographs, drawings and notes must be ample and complete for work in this neglected field to be valuable or worth undertaking.

I suggested at the outset the making of these studies down to the close of the last century. Archaeologists who are more familiar with events prior to the birth of Christ than with those that transpired after it may think this too wide a limit for archaeological study. But archaeological study should not be incomplete if there are later works to supplement it, and the archaeologist who will devote his time to the study of the house may well be asked and expected to continue his research down to the latest times. The architecture of the seventeenth and eighteenth centuries, even in the ecclesiastical form, is scarcely studied; how much more important is it therefore that we try to make the most of its houses. Here again France is very rich, two cities, Toulouse and Bordeaux, and especially the former, being exceedingly rich in monuments of these dates. No one studies these; their forms, their relations to previous dwellings, their influence upon the form of our own dwellings is scarcely known. The architectural type is not beautiful, and in many instances scarcely pleasing; I would rather call it interesting, as every sort of structure must be that illustrates any phase of human culture.

While speaking of Toulouse, I may be permitted to refer to a work recently published in that city that illustrates, in one aspect, the sort of work we need to see applied to every town in Europe. In "L'Album des Monuments et de l'Art ancien du Midi," of which the first part was brought out by the Société Archéologique du Midi de la France, of Toulouse, in 1894, there was printed an archaeological map of the city, in which the houses of different dates were carefully marked, so that the student can, at a glance, tell exactly what buildings of each century are in Toulouse and where they are situated. It is needless to point out the utility of a work such as this. A series of such maps for the chief cities of the Continent would be of the greatest value and interest.

I have no doubt but that those familiar with the architecture of Europe outside of France will agree with me that much the condition I have outlined for that country is true of the balance of the Continent. These conditions, to repeat what I have before stated, are:—(1) an enormously rich field, which (2) has scarcely been worked; (3) many important individual monuments have been studied, especially those of the Renaissance period; (4) what work has been done has been diffuse and without system; (5) a necessity for extended systematic study.

How far work of the nature I have suggested can be carried out by American students I am not prepared to say. It cannot be hastily done, and to be properly performed must entail more or less drudgery. American architectural students may almost be counted out of the race, though their assistance should be welcomed and valued. Earnest as many of these young men are, they want something striking to show for their work; it is the beautiful and the picturesque they are in search of. I doubt if much can be expected from them through the uninteresting nature of much of the material to be studied. It is, further, work that requires long-continued labour to bring adequate returns. A study of a single building is scarcely likely to have the value that the study of a group in the same vicinity would have. It is therefore hardly possible, as the archaeological outlook now is, to hope for much in this department from any but the French themselves. Whether it is in good form to suggest to them that this work needs to be done, whether it is advisable to advocate the general study of European domestic buildings throughout the whole Continent, I must leave to others to determine. My present purpose will have been accomplished when I repeat that in this one subject is an archaeological field, close at hand and ready of access, of most amazing richness. And further, that each day detracts from its volume; each day sees new repairs, new restorations, new changes by people who have no thought of art or of archaeological value. The longer this work is postponed the less there will be for the future historian of this architecture to concern himself with. It would be easy for me to say I know no more important division in archaeological work than this, because I am not familiar with any phase of archaeology save that which relates to the Middle Ages. But I trust the importance of this work, yet to be done, will be recognised, and I earnestly hope the day is not far off when the beginnings will be made. Meanwhile, it would be well for some enterprising person to find out what has already been done. A bibliography on the subject would be enormously helpful, and would have the twofold value of preventing the duplication of work already done, and of showing by contrast how little has been done.

One word on the general method of study. Architecture is not, to my mind, a bare recital of forms; architecture is the result of the efforts of the human mind to provide shelter for the human body, primarily; and, secondarily, to make these shelters as beautiful as possible. The study of domestic architecture is, therefore, a study of human life. Properly undertaken it brings out the meaning and reality of architecture in a way impossible when it is a mass of descriptions only. Two advantages follow from this. The subject is given a real and live interest it could not otherwise have; and, secondly, it puts

architecture before the general public in a living way, before people who now look upon it as the dullest and stupidest of subjects. I am not sure but that this last aspect of the question is the more important; at least, it suggests possibilities from the study of old, and in many cases broken-down houses in Europe that may not be apparent at first thought.

OLD V. NEW LONDON BUILDING ACT.

ON Monday the first important case under the new Building Act was heard at Bow Street before Sir John Bridge, and it revealed a serious flaw in one of the sections. Mr. C. F. Hayward, district surveyor for the parish of St. George, Bloomsbury, was summoned by the building owners of Bedford Court Mansions, who set forth in their information that the defendant had served them with notice of objection to the proposed erection of a certain building, and they called upon him to show why the decision should not be reversed.

Mr. Horace Avory for the complainants explained that the object of the complainants was to obtain the ruling of the Chief Magistrate as to the meaning of section 212 of the new London Building Act of 1894, which came into operation at the beginning of the present year. It was an Act to repeal the various Building Acts of the Metropolis and to simplify matters. Unfortunately, simplification had not been one of the results up to the present. In 1890 his clients entered into a contract with the then Duke of Bedford to take the lease of a piece of land in what was now called Tavistock Street, but which was at that time a mews, at a ground-rent of 2,000*l.* a year. They undertook to erect buildings on the land, after taking down the then existing structures, and erect certain flats in accordance with plans approved by the Duke of Bedford, or his representatives, and complete them before June, 1895. The building was to be erected in blocks. One block had been erected, and it was now proposed to go on with the erection of the other blocks. The complainants had paid since 1890 2,000*l.* a year for the land. They had given notice to the surveyor of their desire to finish the building, and he had intimated that it now came under the new Act. The importance of this to the complainants was that under the new Act the Council could require a much larger area of air space than they could under the earlier Acts. Therefore, if the contention of the Council were good in law the complainants would have to curtail the size of their buildings, and there would be a corresponding reduction in the rents to be obtained. There were two questions to be decided—(1) Whether the building the complainants proposed to erect was in progress when the new Act came into force at the beginning of the year; and (2) whether, supposing it was not a building in progress at the time, it was not a building which had to be carried out under a contract entered into before this new Act. In support of his argument Mr. Avory quoted the following sections of the Act:—(Section 210)—“A building, structure, or work erected or constructed before the commencement of this Act, to which no objection could have been taken under any law then in force, shall (subject to the provisions of this Act as to new buildings or the alteration of buildings) be deemed to be erected or constructed in compliance with the provisions of this Act.” (Section 212)—“Notwithstanding anything contained in this Act, a building, structure, or work which has been commenced before and is in progress at the commencement of this Act, or which is to be carried out under any contract entered into before the passing of this Act, may be completed subject to and in accordance with the provisions of the Acts relating thereto as in force immediately previous to the passing of this Act.” He added that during the present month the Council had consented to the addition of bay windows and balconies to the building. Evidence was then given as to the agreement between the complainants and the Duke of Bedford.

Mr. Freeman, for the County Council, said the case was one of very great importance, as it was the first under the new Act. He contended that the buildings it was now proposed to erect were new buildings under the new Act. It was quite true that block A had been erected, but that did not throw a protection over blocks B, C and D. He submitted that they were separate buildings, and that the agreement between the complainants and the Duke of Bedford was not a contract within the meaning of the Act. It was obvious that the duke and the complainants intended from the first to treat these blocks as separate buildings. Under the agreement block A was to have a lease given to it directly it was finished, and so on with the others. If Mr. Avory's contention were correct much inconvenience would be caused, and work might be delayed for ten, fifteen, or even twenty years.

Sir John Bridge remarked that there were two grounds on which Mr. Avory argued that he ought to give a decision in favour of his clients. The first was that the whole of these four blocks were one building which had been commenced and was in progress at the commencement of this Act. He was inclined

to think that Mr. Avory was wrong on that point, but it was not necessary to decide that. The great point to be decided was whether this was a work to be carried out under a contract passed before this Act. In his opinion it was, and the building came under the old Act. He must give to each word in the Act its ordinary meaning and its ordinary construction. It might have been better if the section he was asked to decide upon had been made clearer; but, as he said before, he could only give to words their ordinary construction, and his decision was in favour of Mr. Avory's contention.

Mr. Avory asked for costs, as the complainants had had to come for an interpretation of the County Council's private Act, and were found to have been right. Sir John Bridge said he did not think he could allow costs in a case of the kind. Mr. Freeman intimated that the case would be taken to a higher court.

TESSERÆ.

The Temples at Pæstum.

FEW buildings are more familiar than the temples of Pæstum, yet the moment when the traveller first comes in sight of works of untouched Hellenic skill is one which is simply overwhelming. Suddenly, by the side of a dreary road, in a spot backed indeed by noble mountains, but having no charm of its own, we come on these works, unrivalled on our side of the Adriatic and the Messenian Strait, standing in all their solitary grandeur, shattered indeed, but far more perfect than the mass of ruined buildings of later days. The feeling of being brought near to Hellenic days and Hellenic men, of standing face to face with the fathers of the world's civilisation, is one which can never pass away. Descriptions, pictures, models, all fail. They give us the outward form; they cannot give us the true life. The thought comes upon us that we have passed away from that Roman world out of which our own world has sprung into that earlier and fresher and brighter world by which Rome and ourselves have been so deeply influenced, but out of which neither the Roman nor the modern world can be said to spring. There is the true Doric in its earliest form, in all its majesty. The ground is strewn with shells and covered with acanthus leaves, but no shell had suggested the Ionic volute, no acanthus leaf had suggested the Corinthian foliage. The vast columns, with the sudden tapering, the overhanging capitals, the stern square abacus, all betoken the infancy of art. But it is an infancy like that of their own Hēraklēs, the strength which clutched the serpent in his cradle is there in every stone. Later improvements, the improvements of Attic skill, may have added grace. The perfection of art may be found in the city which the vote of the divine assembly decreed to Athēnē; but for the sense of power of simplicity without rudeness the city of Poseidōn holds her own. Unlike in every detail there is in these wonderful works of early Greek art a spirit akin to some of the great churches of Romanesque date, simple, massive, unadorned like the Poseidōnian Doric. And they show, too, how far the ancient architects were from any slavish bondage to those minute rules which moderns have invented for them. In each of the three temples of Pæstum differences, both of detail and of arrangement, may be marked, differences partly of age, but also partly of taste. And some other thoughts are brought forcibly upon the mind. Here, indeed, we feel that the wonders of Hellenic architecture are things to kindle our admiration, even our reverence; but that, as the expression of a state of things which has wholly passed away, nothing can be less fit for reproduction in modern times.

The Gothic Revival.

It was the love of Mediæval lore, of old English traditions of border chivalry which, by the magic power of association, led the more romantic of our sires and grandsires first to be interested in Gothic architecture, and then to discern its beauties. Horace Walpole, both as an author and a virtuoso, may be said to have sown the seeds of this taste, but it is to the writings of Sir Walter Scott that we must refer its further development. Even in his day it was but a sentiment. The grossest ignorance still prevailed concerning the practical adaptation of a Mediæval spirit to masonry and sculpture. One of the chief merits of the Pointed style is, that the origin of every decorative feature may be traced to a constructive purpose. Thus the stone groining over a cathedral aisle not only presents a vista of graceful curves to the eye of the spectator, but covers the area below it with an almost imperishable roof. The earliest promoters of the Gothic revival appreciated the superficial effect of such features without recognising the utility which justifies their adoption. Accordingly the glories of the “fretted vault” were not unfrequently imitated in lath and plaster. Nor were there men of taste wanting to praise the wretched parody. Pugin was the first who deftly expounded the true principles of what he not inaptly named Christian art. No man of his day was better fitted to undertake the task. He

was by profession an architect. He wrote with considerable ability. He entered on the subject with the full information of an earnest student, and with the zeal of a religious enthusiast. There was, however, one drawback to his efforts. He blended his theological convictions with his theories on art, and the result was that the two became identified in the public mind. He had both causes deeply at heart, but he would have served both better by keeping the subjects distinct. As it was, he sometimes offended the communion he had left by needless allusions to his faith and sometimes alarmed his fellow-churchmen by the undue importance which he attached to the style of ecclesiastical decoration. Time has proved that the revival of Gothic architecture is due no more to the teaching of Rome than that of Geneva, and at the present day the Pointed arch is almost as much in vogue among Dissenters as it is with Ritualists. The decision of a Parliamentary Commission in 1836—that the new houses were to be Mediæval in character—gave great impetus to the growing taste; and though the Palace of Westminster may not have realised the highest qualities of the architecture which it is popularly supposed to represent, it has, at least, proved an excellent school for the encouragement of ancient art. It has educated many a sculptor, stone-mason, metal-worker, decorator and cabinet-maker, who would otherwise have grown up ignorant of every phase of ornament save that which had reached him by a perverted tradition. Barry, to whose talent are due the merits of the general design, wisely entrusted to Pugin the fashion of those details which were to enrich his structure. Judged by the light of a maturer taste they may appear deficient in artistic quality. But it is certain that at that time no one could have designed better.

Vastness in Architecture.

In historic art of all periods we find certain picturesque features ever recurring, such as colonnades, arcades, buttresses, recessed openings to massive walls, towers, spires, domes, mouldings and sculptures that grow out of the mason's art. It is by the universal adoption of the same, or analogous, means to attain the same artistic results that the unity of the art is declared. The methods employed may vary at different times, yet the quality aimed at is much the same. Take, for example, the various means adopted at different times to render vastness or sublimity. At one time it is the vastness of mass in the Pyramids, and the impression of solidity and durability that they are so well calculated to give. At another time it is the vastness of the rock-cut tombs and temples (as the Elephantia rocks at Bombay) that chill the marrow with their mysterious gloom, huge columns and colossal deities counter sunk in the rock. At another the vastness of a gigantic columnar edifice that shall give the sense of infinite space, as at Karnak; at another, the ring of monster monoliths at Stonehenge; at another, the vastness of grand scales in the Coliseum at Rome; at another, the vastness of height in the French cathedrals; at another, the vastness of proportions, as at Seville, or Milan, or St. Peter's at Rome; at another, the vastness of long-drawn aisles with monotonous columns and flat roofs, as in the Italian basilicas, or Ely and St. Albans. In most of these examples it is sheer weight and vigour of masses that is employed as an attribute of expression—the undivided weight of solid stone, colossal scale, broad sunshine and unrelieved gloom. The Hypostyle Hall at Karnak is one vast oblong, 380 feet long by 170 feet wide, that has 116 huge columns, and that covers more than 88,000 feet. No artist has been able to reproduce its form so as to convey to those who have not seen it an idea of its grandeur. A flood of light beats down from the clerestory formed by the taller central piers, and the smaller pillars fade away into deep obscurity. Or to speak of that characteristic French way of using vastness of height, in those "soaring miracles of stone" at Beauvais, Le Mans, Tours, &c. And here, though this be the leading purpose of the architect's design, it is combined with other manifest attributes of mechanical power, fertile invention and that conformity to rule which governs the constructive side of perfect architecture; while the higher and spiritual side is proclaimed in a bright imagination, noble proportions, sublime audacity, and the restless, half-sad, half-gay humour of a spirit that yearns after the unattainable.

Philippe le Bel's "Hystoire Saynte."

In the Burgundian Library of Brussels is a Bible written on vellum, with illuminations in gold, silver and colours. It belonged to Philippe le Bel, King of France. For *naïveté* of design, utter neglect of perspective, contempt of probabilities and anachronism of costumes, the vignettes are unmatched. Imagine Elijah mounting into heaven in a long cart, much resembling that in which criminals are conveyed to the guillotine in a highly decorated state, with tongues of bright red flame symmetrically disposed along the sides and wheels. This eligible vehicle is drawn by a horse which a London costermonger would be ashamed to own, lashed, however, into a state of extreme excitement by the efforts of a singularly ill-favoured angel in dirty white garments, who bestrides him

to his evident discomfort. The prophet himself sits meekly in his chariot of triumph, with lifted hands, contemplating the Pegasus by whose efforts he is to reach the favoured and celestial regions, indicated by a line of intense ultramarine blue, and wearing on his face (by some curious and novel process presented to the gazer's view in defiance of all the laws of nature) a very natural and excusable expression of doubt and distrust of ever getting there. The whole concern is just rising, in a highly perilous and perplexing manner, from a pale green ground, upon which, at the foot of a rock, kneels Elisha, decidedly astonished, as he well may be. Like his master, he has performed upon himself a *tour de force* of unparalleled cleverness, for, as he kneels, his limbs, from the knee downwards, are stretched out by his side instead of behind him, a position quite incompatible with modern ideas of anatomy. This is one among a thousand similar examples. Solomon is depicted staring with a look of indescribable horror and dismay, mingled with contemptuous surprise, at three flame-coloured cherubim, who are huddled together in a most undignified heap in a corner of the picture. The monarch is habited in gorgeous robes, blue and gold, and sits upon a hard chair, with an uncomfortably low canopy, in a room, or rather on a sort of background of a mosaic pattern in black, red and gold. But what shall we say of the cherubim? Heads there are indeed, and wings, but little else save a brick-dusty mist; the heads aforesaid being at least twice the size of Solomon's, and the points of the wings serving as feet, or at least supports, to them. These celestials bear a decidedly stupid countenance and look somewhat like schoolboys afraid of a flogging, and neither they nor the wise king seem to know what to make of each other, at which no sensible individual can be astonished. The two angels sent to Sodom and Gomorrah are seen approaching a pinky town, of which the walls and ramparts just reach their heads; the walls (garnished with towers like pepper-boxes) are ornamented with lambent tongues of fire, in the midst of which, and attached to the walls by some mysterious agency, hangs in a very animated attitude a wild, little, black imp, supposed to represent the promoter of evil hovering over the devoted city. One of these vignettes occurs every fourth or fifth page, and in the others every capital letter is blazing with the richest and most elaborate designs, and stiff with gold leaf. And round many a page are rolled the most graceful patterns of leaves and branches in fanciful wreaths, of an elegance and delicacy which furnish a most singular contrast to the agonising stiffness and wooden outlines of the human figures.

Ventilation of Hospitals.

So wide is the difference between the wants of a ward filled with the sick and wounded with respect to ventilation, and the wants of every other kind of apartment in which people in health congregate or lodge, that the means which are found sufficient to maintain the purity of the one fail in maintaining the purity of the other; and an architect who has not submitted to make himself familiar with the state of the atmosphere in, for example, the crowded wards of a badly constructed hospital, at those hours of the day and night when the admission or the exclusion of air is left to the nurse and patients, is ill-qualified to form an opinion on ward ventilation. Until the architect will consent to give his organ of smell a few minutes' practical training, about six or seven o'clock in the morning, in a crowded surgical ward, he can never realise the importance of a truth which can hardly be enunciated with too great emphasis—that not merely must a ward, if it is to be kept sweet, be ventilated in the ordinary sense of the term, but it must be so ventilated as to secure for it the constant renewal of the contained air, the displacement of the foetid effluvia ever being emitted from the bodies of the sick and wounded, and the substitution instead of air not drawn from cellars, corridors and passages, but admitted direct from the store of the unpolluted heavens.

Eastern Art.

The superstition of the East seems to have thought human beauty too mean an ornament for a god. Human beauty requires the human form; but the Eastern religion and art, unable to show superior strength by Herculean muscles, resorted to the rude expedient of indicating it by gigantic size or by many hands; and the sculptor who could not represent divine intelligence in a face attempted to express it by four heads. There are traces of these notions in the Grecian mythology sufficient to show its descent; but at last, after art had been toiling in India, in Persia and in Egypt to produce monsters, beauty and grace were discovered in Greece. It is probable that the quantity of labour employed in England on docks, canals and other useful works during fifty years was greater than that employed on all the boasted works of Asia, from the Wall of China to the Pyramids. To pierce a country in all directions with canals was, in truth, a greater work than any of them. But our public works being dispersed, unornamented and for purposes of obvious use, want the qualities that impose on the vulgar imagination.

NOTES AND COMMENTS.

THE election of Mr. GEORGE CLAUSEN as an Associate of the Royal Academy is satisfactory. As a painter he is slow in production, and it must be said he has avoided the common ways of gaining notoriety. When Mr. CLAUSEN left the South Kensington Training School he promised to be one of the foremost decorators of our time, and when he joined an industrial establishment as designer he seemed to be in his right place. If he abandoned that class of work there was an excuse for him which does not avail in nine-tenths of the cases where designers are ambitious to become painters. Mr. CLAUSEN possesses pictorial ability. His drawings and paintings do not appeal to the multitude, for he is indifferent to that prettiness which is better adapted for boxes of confectionery than for pictures, but which is admired by publishers, dealers and their patrons. Yet we are not certain that Mr. CLAUSEN has yet discovered his line. He has the courage to be realistic and sympathy with the pathos of humble life. He shows himself to be the worthiest follower of BASTIEN LEPAGE, but now that he has gained position it would be well to be more true to his own genius.

IN the "Sketches of Durham," by the Rev. G. ORNSBY, we read:—"There is every reason for supposing that an apse terminated the eastern extremity of the cathedral as finished by the Norman architects. Mr. RAINE supposes the choir and aisles each to have had apsidal or semicircular terminations, but there appears much plausibility in the reasons which Mr. BILLINGS alleges for his suggestion, that the aisles were carried round the apsidal ending of the choir." BILLINGS'S theory of the ambulatory has generally prevailed, but a discovery by Canon GREENWELL a few days since proves that Canon RAINE made a nearer guess to the original arrangement. While some men were engaged in the excavation for a heating apparatus at the east end of the south aisle, Mr. GREENWELL perceived that the outer wall against which they were working was ashlar faced, and as such masonry was strange in foundations, he asked the men to dig a little to the east, when he discovered that the aisle had an apsidal termination and did not form one side of an ambulatory as was generally believed. The discovery led to a similar excavation being made in the northern aisle of the nave, which was also found to have an apsidal termination. The wall of the apse in each case is of immense thickness and solidity. It is planned in semicircular form on the inside and square on the outer or eastern side, and measures from its curved face to the square face no less than 12 feet. Canon GREENWELL considers the solidity of this foundation work implies a superstructure of heavy masonry, but as to what CARILEPH intended in this direction nothing is disclosed. The excavations are in progress, and it is hoped that the apsidal end of the choir will also be discovered, and then the ground plan of CARILEPH'S east end can be traced.

AT the annual meeting of the managers of the London Board Schools on Tuesday the growth of defective eyesight among the pupils was mentioned, and it was suggested that a special inquiry into the causes should be undertaken. The Secretary of the Education Department, who was present, told them that a committee had been appointed with the same object, and in addition to the services of Mr. SHARPE, who was the senior inspector of schools, and of some of the ablest officers of the Department, Mr. BRUDENELL CARTER'S were also available. The inquiry should be comprehensive: Twenty years ago it was assumed that the children suffered through the inadequate and haphazard lighting of schools and the awkwardness of their position when writing, owing to the defects of the desks. Although the rules prescribed for the size and position of windows are observed, and the angle of the desks is different, yet there seem to be as many weak eyes as formerly. It cannot be said any longer that either architects or school furnishers are responsible for the defects. It might be an advantage if children were not obliged to employ white paper when writing, and if their books were not printed on white paper. When Sir JOHN MACNEILL, the engineer, printed his "Earthwork Tables," which forms the largest volume of its

class, he consulted Mr. BABBAGE, the mathematician; about the best means to avoid fatigue to the eyes of calculators. After experiments it was ascertained that with toned paper the pages of figures could be consulted for many hours with ease. The type used in them was sharply cut. Much of the type used in cheap school books imposes a strain on the eyes, but the worst of all is the type used in printing the periodicals which are most often read by children in Board schools.

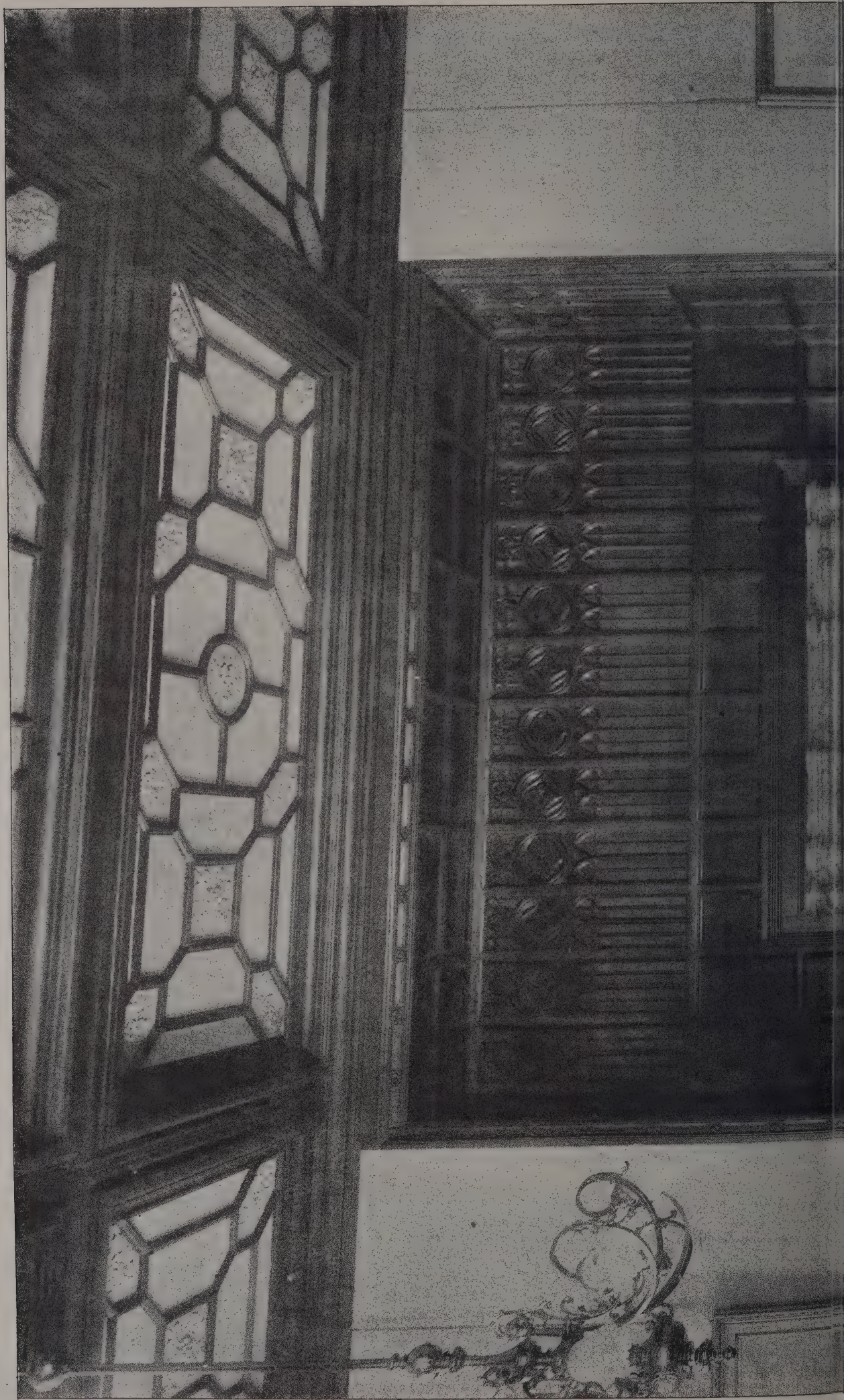
THERE are so few opportunities for erecting buildings on a large scale in Ireland, there is a risk that architecture may soon become like one of the lost arts of the Celts, which are so often deplored. Although it is only on a lunatic asylum, the proposed expenditure of 200,000*l.* must be satisfactory intelligence for architects as well as for contractors and building workmen. The competition for the Portrane Asylum, near Dublin, was limited to fifteen Irish architects, but as three retired, only twelve sets of plans were sent in. The Board of Control obtained the aid as assessors of three English experts, viz. Sir A. MITCHELL, Mr. G. C. HINE, architect, and Dr. MOODY. They came to the conclusion that the designs marked "Luna," "Mens Sana" and "Aspect" were equal in merit. They were prepared by Mr. GEORGE C. ASHLIN, Messrs. RAWSON CARROLL & BATCHELOR and Mr. W. KAYE PARRY. There are two bodies who have an interest in the undertaking, viz. the Board of Guardians and the Board of Control for Asylums, but we believe the final selection will depend on the latter. The estimates of cost which are being prepared will of course have an influence on the decision. It is not often three out of twelve plans are placed so high, and the award suggests that in spite of the dearth of opportunities for practice the Irish architects are skilful in planning, and with a class of buildings of which the examples in their own country are only adapted to serve as warnings of defects.

AMONG the paintings added to the Luxembourg collection is the *Benedicite*, by Mr. J. H. LORIMER, the Scottish painter, and the *Cigarreras*, by Mr. WALTER GAY, the American. From a Fleming M. BAERTSOON, a *Canal Scene*, and from M. LUND, a Swede, a *Landscape*, have been also purchased. Paintings by the French artists, MM. CORMON, CAZIN, GENEUTTE, TATTEGRAIN, PERRET, AGACHE, GUIGNARD and BOUVOT are also among the additions. There is more room for statuary than for paintings in the Luxembourg, and six new examples now appear, besides some that belong to industrial art.

THE French painter of rural scenes, M. GASTON GUIGNARD, has succeeded, it is said, in the employment of water-colours on the sort of canvas commonly employed in oil-painting. This is done without any coating which would prepare the surface. But M. GUIGNARD employs a varnish which, although not adapted for use on paper, increases the effect of the colours in several ways, and especially imparts brilliancy to them. The French *aquarelle* differs from the English drawing on coarse or smooth paper, and is better adapted to be utilised for the production of mysterious effects. Although M. GUIGNARD'S treatment may find many admirers in France, we doubt if it will achieve conquests in England, where the old-fashioned ways of applying colours are not obsolete.

SOME of the French papers have been reviving the legend about the burial-place of ALEXANDER THE GREAT. Not long since a fine sarcophagus was found, which is now in Constantinople, and from the inscriptions it was declared to be the tomb of the conqueror. But there are many who believe in the tradition that ALEXANDER'S body was carried from Babylon to Alexandria and buried beneath a hillock. In order to keep the spot sacred MEHEMET ALI erected a mosque over it. One of the walls, it is said, has settled, and a glimpse is obtainable of the subterranean part, that contains massive masonry, which, it is concluded, must enshrine ALEXANDER'S tomb. The Egyptian Government will not allow any exploration to be undertaken. The story may be only another of the imaginary grievances which are supposed to arise out of the English control in Egypt.

The Architect, Feb. 1st 1895.





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DRAWING ROOM, THURLAND CASTLE, KIRKBY LONSDALE.
Messrs. PALEY & AUSTIN, Architects.



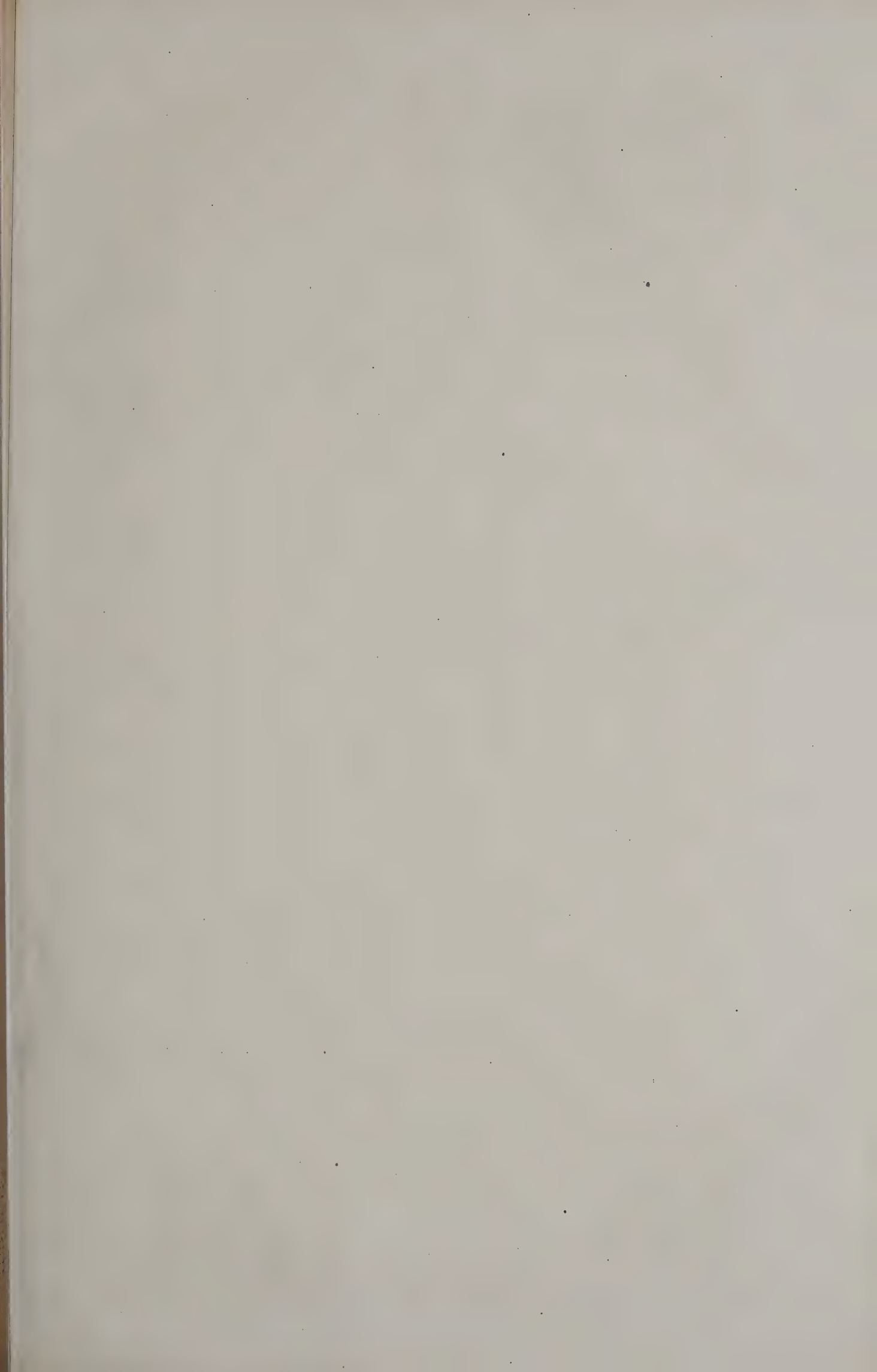
NORTH AISLE OF THE R.D.
The late ANDREW

Feb. 1st 1895.



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BAPTISTS' CHURCH, PERTH.
TON, Architect.



The Architect, Feb. 1st 1895.





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THE SUN ASSURANCE OFFICES, GLASGOW.
WM. LEIPER, A.R.S.A., Architect.

ILLUSTRATIONS.

THE SUN ASSURANCE OFFICES, GLASGOW.

DRAWING-ROOM, THURLAND CASTLE, KIRKBY LONSDALE.

NORTH AISLE OF THE REDEMPTORISTS' CHURCH, PERTH.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute of Architects was held on Monday evening, Mr. Aston Webb, vice-president, in the chair.

Mr. J. A. STRAHAN, barrister, read a paper on

The Legal Position of Architects in Relation to Certificates and Awards.

Mr. Strahan in his preliminary remarks noticed there had been a tendency to settle disputes outside of the Law Courts. The former system of giving a salary to a judge instead of levying fees had made a change. The need of settling disputes that arose under contracts without having recourse to litigation had long since been felt by architects. Two methods had been suggested: one in short might be called settlement by certificate, the second by reference to a third person—in other words arbitration. In settlement by certificate it must be shown in the contract as a condition precedent, or the contractor could take no action. Even then certificates given during the progress of the work only enabled a contractor to claim the amount certified for. A final certificate could include extras, but it could not hinder a final readjustment in the case of extras improperly ordered. The certificate when a precedent condition, to right of action, on the part of a contractor, constituted a final certificate conclusive both against the contractor and also in favour of the contractor. Arbitration was not necessarily made a condition precedent to the right of action. If made a condition precedent, there was no alternative but to arbitrate, and the Courts could do nothing till an award was made. In case of disputes the position of the architect was that he acted as a certifier or as an arbitrator. In arbitration the architect acted in a judicial capacity, in certification or valuation the architect was merely the skilled servant of his employer. The Courts had power over an arbitrator, but no power over a certifier. As certifier an architect could proceed as he liked. He was not bound to hear any evidence on either side. His decision, though erroneous, if *bona fide* and honest would be valid. The architect would be liable to his employer for the result of his certificate, but though an action was taken by the employer it would not shake the certificate, nor would there be liability from the architect to the contractor. Mr. Strahan then considered the advantages and disadvantages of each method, viz. certification and arbitration. He gave his reasons for thinking that though it probably depended in some cases on the merits of any actual contract, in a general way, no doubt, settlement by certificate was the best for parties all round.

The CHAIRMAN in inviting a discussion intimated that the Institute would at an early date revise the conditions of contract.

Professor KERR proposed a vote of thanks to Mr. Strahan. The result of the reading of the paper would be to create alarm. As architects, they considered it was unfair for an architect to be an absolute judge without appeal. An architect gave his decision loyally, and it was as a rule loyally accepted, for the architect as a judge was absolutely impartial. Under litigation, lawyers had no half-way. One party must be wholly right and the other party wholly wrong. In arbitration, each party appointed their own agent, and these appointed a third. These three talked the matter over and an equitable settlement was arrived at.

Mr. E. T. HALL seconded the vote. Many great corporations preferred to have the architect as final referee. No final certificate of completion should be given. They should leave contractors to the Statute of Limitations. The Builders' Institute were in favour of that procedure.

Mr. WOODWARD said an architect should not be judge in his own case. A builder should have protection against an architect in case of an architect's negligence or ignorance.

Professor BANISTER FLETCHER considered that no builder should have a responsibility hanging over his head for years, and the architect have none. An architect was not a third party in a dispute. He held a fiduciary position, and should hold liability equally to client and contractor, or else have no liability to either.

Mr. WM. WHITE and Mr. RICKMAN supported the vote, which, having been passed, the meeting adjourned.

Mr. Fellowes Prynne has designed a new carved case for the organ at St. Mary Church, near Babbacombe Bay, which will be carried out in oak.

WELLS CATHEDRAL.

AT Toynbee Hall on Sunday night Mr. Edmund Buckle, diocesan architect for Bath and Wells, contributed a description of Wells Cathedral to the course of Sunday evening lectures on English cathedrals now being held at the hall. With the aid of the oxy-hydrogen lantern he gave a large number of interesting views of the more prominent features of the cathedral, and described its architecture in detail. He observed that Wells was by no means the grandest or most magnificent of English cathedrals, but it had a peculiar interest of its own and contained many striking features, noticeably in its statuary. It was one of the few cathedrals which had retained its Mediaeval surroundings. In close proximity to it were a number of buildings with which it was connected and which, for the most part, were still used for the purposes for which they were originally intended. The actual foundation of the cathedral was of a very uncertain date—the year 700 was given by tradition. All that was really known was that a portion of the older building came into existence at the time of Edward the Elder. The font was the oldest remnant of the earlier church, and dated from the twelfth century. All the earlier portions were in a style known as the local Somerset style, the later addition on the eastern side being in the Early English style, and of a far more decorative character. A remarkable feature was the St. Andrew's arches supporting the main central tower. At the extreme east was a large window known as "the golden window," on account of the large amount of gold and green glass used in it. It still contained the original glass. The clock was another feature of interest. It originally had wooden works, which had now been removed and could be seen in working order at South Kensington. It dated from the fourteenth century. The sculpture on the western front of the cathedral was very beautiful and elaborate. There was also a lady chapel, a chain gate, a vicar's close, and a large number of very ornamental chantries. The lecturer concluded by describing the bishop's palace adjoining the cathedral, which, he said, was one of the few remaining specimens of a thoroughly-protected and fortified bishop's house to be found in this country.

ST. PAUL'S CHURCH, MORLEY.

THE new nave of St. Paul's Church, Morley, has been dedicated. The edifice occupies the site of the old church, which was consecrated in 1877 by the Bishop of Ripon. The church had only sittings for 275 persons. The building committee sought the advice of Mr. G. H. Fellowes Prynne, F.R.I.B.A., of Westminster, who submitted a report to the effect that the old building could not be enlarged in any way to meet the requirements of the district. Mr. Prynne prepared plans of a new nave, with side aisles and transepts, to afford accommodation for 800 persons. The complete scheme, however, includes the erection of a chancel, a tower with spire and a baptistery. The cost of the whole scheme is estimated at 10,000*l.*, and the cost of that portion which has this week been completed is estimated at 6,300*l.*

The new church is a large and commodious stone building of the Early English Transitional Period. The nave, which is entered under a massive archway, is lofty and broad, 95 feet in length and 28 feet in width, divided into five bays, the nave itself giving accommodation for 446 adults in front of the chancel and altar. The roof is of ribbed barrel vault frame. Massive stone pillars support the arches of the nave, the main spandrels over the arcade being surmounted by clerestory quatrefoil windows. The north and south aisles abut against the three western bays of the nave, the northern aisle being reconstructed from the north aisle of the old church. The porch leading to this is the old porch rebuilt.

A double transept is thrown out on either side terminating in a chancel aisle. The north transept consists of a portion of the old nave rebuilt in a new position and terminates in choir-vestry and organ-chamber. A western exit is supplied to each transept. A clergy and choir vestry, with a good sized heating-chamber under, is placed at the eastern side of the choir-vestry and is connected with it by a door, both entrances having separate entrances for a porch and to the church. The materials of the old church have been re-used to the utmost possible extent. The seats in the nave and transepts consist of chairs.

The hot-water system of heating the church has been adopted, the apparatus being supplied by Mr. de Ridder, of Liverpool.

The tower and spire has been designed to be placed at the south-west end of the south aisle, and it may be built in future without injury to or interference with the new church. The whole of the work in connection with the erection of the nave has been carried out in a satisfactory manner by Messrs. J. & J. Sugden. Mr. J. Wornell has been clerk of works, and Mr. R. H. Hale quantity surveyor.



ST. GEORGE'S CHURCH AND PARSONAGE, BARROW-IN-FURNESS.

E. G. PALEY'S CHURCHES.

IT is not always possible to determine the proportion in which the members of a firm of architects contribute to the preparation of designs. The individuality of the late Edward Graham Paley was, of course, merged in the work of Paley & Austin, of which there are a great many examples. It is right, however, that a younger generation of architects who are acquainted with the firm's churches should be aware that Mr. Paley for years was without a partner, and was able to make a reputation as an architect. We have therefore produced views of a few of the Lancashire churches which were produced from his designs. It will be observed that they were intended to meet different requirements, and most of them were "cheap churches," but they all have a distinct character.

When the church at Barrow-in-Furness was erected the town had not attained its present importance. The money for the building was given by the Duke of Buccleuch and the Duke of Devonshire. The church had room for over six hundred people, and cost about 4,000*l*.

The church of St. Mark, Preston, is the largest, for it can accommodate about a thousand worshippers. The nave, it will be seen, is large, measuring 91 feet by 41 feet, with a chancel of 36 feet by 27 feet 6 inches. On one side of the latter are the tower and vestry, and on the opposite side the organ chamber. The walls are of Longridge stone lined in the interior with red bricks. The principal entrance is by a porch at the west end, over which is a large five-light window.

The church at Over Darwen was erected at the expense of two individuals. The stone was from local quarries. It cost about 6,000*l*.

Trinity Church, Bury, was erected on a site given by the Earl of Derby. In designing it provision was made for future enlargement. The nave measures 75 feet by 25 feet, chancel 28 feet by 22 feet, and the height to ridge is 43 feet.

A bequest of 12,000*l*. for the building and endowment of a church, parsonage and schools was the origin of Allithwaite Church. All that could be expended on a church to hold three hundred and fifty people was 2,500*l*.

The *Lancaster Guardian* of Saturday last contains the following interesting memoir of Mr. E. G. Paley:—

Mr. Paley was not a native of Lancaster, though he has for nearly sixty years been closely identified with the town. He was born in September, 1823, at Easingwold, near York, and was the fourth son of the Rev. Edmund Paley, vicar of that place, and grandson of the Ven. Archdeacon Paley. He was principally educated at Christ's Hospital, London, and whilst there had the honour of being presented, as the grandson of Archdeacon Paley, to the Duke of Wellington, who gave him a golden guinea, which memento of his interview with so notable

a person Mr. Paley long retained in his possession. He came to Lancaster in October 1838, and became a pupil of the late Mr. E. Sharpe, by whom, at the completion of his articles in 1845, he was taken into partnership. The firm speedily acquired an extensive practice, the excellence of their designs and the thoroughness with which the works undertaken by them were carried out enabling them to attain a reputation second to no other firm of architects in the North of England. More particularly was this the case in ecclesiastical architecture, and there is probably no other architect in the country who has for so long a period occupied the prominent position enjoyed by Mr. Paley in regard to Church architecture. Monuments to his skill and versatility in designing and to the excellence of workmanship, for which he early acquired fame, are to be found all over Lancashire and Yorkshire, and there are few dioceses in the country which do not contain one or more churches erected under his supervision.

In 1851 the late Mr. Sharpe retired from the firm, and from that time up to 1868 Mr. Paley carried on business on his own account, and during this period he designed many new churches in Lancashire and Yorkshire, as well as other public buildings. Perhaps the most noteworthy specimen of the work carried out by him at this time in the Lancaster district is St. Peter's Church, with the presbytery, schools and convent, which were erected in 1859 at a cost of 15,000*l*. Amongst the public buildings designed by him during this period, and erected under his supervision in the immediate neighbourhood are the Royal Albert Asylum, the Royal Grammar School, the Cemetery buildings, the old Savings Bank, the Waggon Works, and many smaller buildings of a more or less ornate character.

In 1868 Mr. Paley became associated with Mr. H. J. Austin, and at a still more recent date Mr. H. A. Paley became a member of the firm. Since 1868 the firm have been responsible for the architecture and construction of no less than forty churches in various part of the country, many of them in the immediate neighbourhood of Lancaster. Though, however, ecclesiastical architecture may be said to have been the chief character of the business carried on by the firm, their efforts were not infrequently directed in other channels. The mansions of many of the principal landowners in Lancashire and Westmorland have either been built or at one time or another undergone restoration and renovation at their hands, amongst other county residences to which additions and alterations have been made in comparatively recent years being those of the late Lord Winmarleigh, the late Earl Bective, Sir J. Ramsden, the Duke of Devonshire, Sir Gilbert Greenall and Mr. John Fell, whilst many schools and public buildings have been erected under the supervision of the firm. One of the latest works in which Mr. Paley took the greatest interest was the erection of the Storey Institute at Lancaster, a building not

only architecturally beautiful and an ornament to the town, but remarkably well adapted to the purposes for which it was designed. In the matter of ecclesiastical architecture it may be mentioned that Mr. Paley's firm have designed and erected episcopal churches costing 300,000*l.* in the Manchester diocese alone. Mr. Paley was a member of the Council of the Royal Institute of British Architects, and was this year one of the examiners of the Institute.

Although from time to time taking a very active part in the management of many institutions and associations of a more or less public character in the town, Mr. Paley seems to have steered clear, except for a very brief period, of actual municipal work. For three years only he was a member of the Corporation. For many years the deceased gentleman discharged the duties of County Bridgmaster of the Hundred of South Lonsdale, and in that capacity regularly presented reports to the Court of Quarter Session as to the repair and maintenance of bridges in this district. The new bridge over the Lune at Caton was designed by him, and was carried out under his supervision by Sir Abraham Woodiwiss, of Derby.

Mr. Paley took the greatest interest in archæological and antiquarian researches, was for many years a member of the Royal Archæological Society, and so far back as 1858 he, along with the late Mr. E. Sharpe, conducted the members of the Society through the parish church, the castle and to various spots of antiquity and interest in the neighbourhood. He was also a member of the Cumberland and Westmorland Archæological Society, and took part in many of the excursions and meetings held by this Society in recent years. Locally there are few public organisations of which Mr. Paley was not at one time or other an active member. He was one of the founders of the Lancaster Choral Society, and being himself an accomplished musician, has always taken a keen interest in the progress of the Society and in the culture of music in the town. For many years he was a director of the old Athenæum Company, and he was one of the promoters of the recently defunct Philosophical Society. In the work of the old Mechanics' Institute the deceased gentleman was a very active participator, taking an especial interest in the School of Art, for many years held in the Institute. He successively filled the offices of secretary, treasurer and president of the school, and at the time of his death was a member of the committee of the Storey Institute, taking an especial interest in the culture of art as applied to industries. He was also for many years a member of the Lancaster Charity Trust, having been elected in October, 1879, in succession to the late Mr. Richard Hinde. In early life Mr. Paley was a prominent oarsman, and along with Mr. Sharpe was chiefly responsible for the formation of the Lancaster Rowing Club. In 1844-47 a crew composed of Messrs. Sharpe, Paley, T. Austin and Buck achieved some notable victories over crews from Liverpool, Chester, Preston and Fleetwood. Throughout his busy life Mr. Paley continued to take an active part in the management of the club, and at the

Jubilee banquet in October, 1893, humorously offered to "find a crew of old 'uns to compete against the young members." Mr. Paley married in June, 1857, Fanny, the third daughter of the late Mr. F. Sharpe, of Knutsford, Cheshire, who, with one son and three daughters, are left to bewail his loss.

Mr. Paley was an active member of the central committee of the Royal Albert Asylum; in fact, he was one of the original ten members of the committee who held their first meeting on November 14, 1864, to consider "the offer of Mr. James Brunton, of Morecambe, book-keeper, to give the sum of 2,000*l.* towards the establishment of an asylum in or near Lancaster for the reception, care and training of idiot children, and to confer on the advisability of making an attempt to establish such an asylum, and as to the practicability of raising funds for that purpose." At that meeting there were present Dr. E. D. de Vitre (chairman), Messrs. Ross, Harrison, Sharp, Howitt, Milner, Brunton, Seward, Paley, Grant. It was then resolved that these gentlemen, with Mr. Thomas Storey and Mr. Wm. Roper, should form the provisional committee. When the project began to take shape, and plans for the building were talked of, Mr. Paley retired from the committee, and he was appointed architect on April 25, 1866. In May, 1878, Colonel Thornhill, on leaving Lancaster, resigned his membership of the committee, and Mr. Paley was invited to take the vacant place. From that time until his death he took a most earnest interest in the management of the institution, and he attended the last meeting of the committee on the 11th inst., though he then complained of feeling a little out of sorts. As may be supposed, there was no scheme for the enlargement or extension of the asylum (of which he was the able architect), which had not his thoughtful consideration in its incipient stages, and its oversight in being carried out seemed to have his constant and loving care. Mr. Paley will be greatly missed at the Royal Albert Asylum, he was so genial and courteous; he attended the committee meetings so regularly and he was always deeply interested in the training and progress of the patients. He was chairman of the Branch Establishment for private patients at Brunton House.

The announcement of Mr. Paley's death will come as a shock to many outside Lancaster, by whom he has been known as one of the most eminent architects of the country; but in Lancaster his decease will be deeply regretted, not merely because he was one of the foremost of our citizens, but on account of his geniality, kindheartedness and readiness to help in every good work. He was one of nature's gentlemen, always cheerful and kindly; and he was deservedly esteemed and respected by all with whom he came in contact. Immediately on the news of his death being circulated flags were hoisted half-mast at the Town Hall, Royal Albert Asylum, Ripley Hospital, Parish Church, County Club and other public buildings, and regret was very generally expressed that death had removed one who had lived so active and useful a life from amongst us. The remains of the deceased gentleman were interred on



ALLITHWAITE CHURCH.



TRINITY CHURCH, BURY.



CHURCH, OVER DARWEN.

Saturday morning, service commencing in the parish church at eleven o'clock. The Mayor and Corporation assembled at the Town Hall at ten o'clock, to pay the last tribute of respect to the memory of the deceased.

LIST OF PRINCIPAL WORKS DESIGNED BY MR. PALEY'S FIRM.

Messrs. Sharpe & Paley.

In 1845 Mr. Paley became a partner with Mr. Sharpe, and the firm carried out the rebuilding of the parish church at Wigan, new churches at Knowsley, Lever Bridge, Rusholme, and other smaller ones; new halls at Capernwray, in Lancaster, and Ince, near Chester; large additions to the County Lunatic Asylum and Castle at Lancaster, &c.

Bank, Royal Grammar School and several smaller buildings. At Barrow-in-Furness, large ship works and jute mill, schools, new bank, old railway station, &c. For Furness Railway Company, stations and hotel at Furness Abbey, Grange, &c.; hotel at Grange; mansions at Abbotswood (for Sir James Ramsden), Wennington, Dalton, Newfield Halls, Browhead, Windermere, and numerous smaller buildings, schools, parsonage, houses, &c.

Messrs. Paley & Austin.

Mr. Paley became associated with Mr. H. J. Austin in 1868, and since that date the firm have designed and carried out above forty new churches, many large and important, viz.:— Mossley Hill, Liverpool (with parsonage); Kirkby (for Lord Sefton); the Saviour's and All Saints at Bolton-le-Moors; St. Mary's, Beswick; Higher Broughton, and St. John's, Cheetham Hill, Manchester; St. Clement's, Salford; Millom; Bettws-y-



ST. MARK'S CHURCH, PRESTON.

Mr. E. G. Paley.

From 1851 to 1868 Mr. Paley practised on his own account, and designed and carried out several new churches, viz.:— St. George's and St. James's, Barrow-in-Furness; St. Peter's Catholic Church (with presbytery, schools and convent), at Lancaster; Poolstock, near Wigan; Ringley, Allithwaite (with parsonage house and schools); Aughton, St. Thomas's, Blackburn; Bradford (Holy Trinity); Bury, Bradshaw, Hoddesden, Higher Walton, Penwortham, Ince, Wrightington, Lowton, Walton, in Cumberland; Walney Island, Rossall School Chapel, Penny Bridge, Blawith, Singleton, Quernmore, Woodlands, Over Darwen, Thwaites, Livesey, St. Mark's, Preston; Stockton Heath; new Parish Church, Bolton-le-Moors; Catholic churches at Garstang and Yealand Conyers, &c. Restoration and enlargement of the parish churches of Winwick, Cartmel, Lancaster, Burnley, Easingwold, Crayke, Ulverston, Kirkby Lonsdale, Poulton-le-Fylde, Penn, Caton and others. At Lancaster, the Royal Albert Asylum, Waggon Works, new Cemetery buildings, Savings

Coed; parish church, Leigh; St. Laurence, Morecambe; Atherton, Winmarleigh; Howe Bridge, Cross Crake; Cuthbert's, Darwen; Walton, near Warrington; St. John's, Greenock; Halliwell, Daisy Hill, St. Anne's-by-the-Sea, Halton; St. Cross, Knutsford; Hutton Roof, Mansergh, Thornton, and Leck, near Kirkby Lonsdale; Largho, Scorton, Pilling, Westleigh Mill, St. Barnabas, Crewe; parish church of Dalton-in-Furness, Lower Ince, mission chapel at Scarborough, Grimsargh, Burnage, Finsthwaite, Torver, Burton-in-Lonsdale, Cloughfold, &c. Restoration (and enlargement in some cases) of the parish churches of Bowness, Heversham, Lytham, Great and Little Ouseburn, Melsonby, Alderley, Broughton-in-Furness, Penn, Bolton-le-Sands, Daresbury, Eskdale, Great Harwood, Halsall, Kirkby Malham, Llanwrst, Fleetwood, Melling, Orton, Ormskirk, Fawley, near Henley-on-Thames; Weston and Wilming-ton, near Eastbourne; Sedburgh, Dent, Colne, Prestwich, and other smaller ones. Grammar schools at Sedburgh, Skipton, St. Bees and Giggleswick. Mansions: New wing at Holker (for the Duke of Devonshire), new tower and enlargement of

Underley Hall (for Lord Bective), Thurland Castle, new wing and terraces at Fawley Court (Henley-on-Thames), Dane Ghyll, Oak Lea, Dunningwell, Chapel Ridding, Windermere; Walton Hall (new offices and enlargements, &c., for Sir Gilbert Greenall), new hall, with stables, lodges, &c., for Lord Winmarleigh. Banks at Barrow and Lancaster, for Lancaster Banking Co., and bank at Barrow, for Cumberland Union Banking Co. The Storey Jubilee Institute at Lancaster.

THE TOLBOOTH OF EDINBURGH.

THE Edinburgh Dean of Guild, Mr. Miller, in connection with the proposed extension of the City Chambers, has drawn up for the Corporation an account of the various places in which the Town Council of Edinburgh has taken up its abode during the last 500 years. The sketch contains much which will be altogether new to most Edinburgh men, says the *Scotsman*, and not a little which will be fresh even to local antiquaries. It will help to solve some points which have been a puzzle to those who have given much time to the study of the sites of the well-known houses, and the general condition of the city, of the times of the Reformation and of the Covenant.

There is one fact that must impress the reader of the record—the smallness of the Edinburgh of history and its abounding poverty. The tale of municipal life is the old Scottish story of how to support a great deal of pride and dignity on a handful of oatmeal. Verily, it was not its population, or the grandeur of its buildings, or the opulence of its inhabitants which made Edinburgh one of the renowned cities of Europe three centuries ago, nor could it be its wealth or size which drew to it the homage of the learned in so marked a manner in the days of Robertson and Scott. Census returns won't explain the fact, and the inquirer must seek for some other explanation than the mere counting of noses.

The Dean of Guild gives his story in brief when he begins by telling that "the municipal buildings of Edinburgh during the seven centuries in which their history can be traced have occupied various sites, but of all these within a stone's-throw of the same spot." This spot which has focussed our Edinburgh life is of course the church of St. Giles, the old town church. It is the only building within the line of the old walls which remains where it was 500 years ago; all else is changed, even the level of the King's High Street has been altered during the centuries. The story refers shortly to an old council chamber which stood in the end of the fourteenth century somewhere near the site of the present police chambers. Of this, the oldest of the town-houses, nothing is known. The fact of its existence is proved from an old Latin charter of St. Giles's Church. It then goes on to relate the founding of what is known as the Tolbooth of Edinburgh, the building which Sir Walter Scott has made famous in "The Heart of Midlothian." This historical building found a site in consequence of one of those accidents which happened to the town periodically—its burning by the English. In 1385 the town was burned and pillaged a little more thoroughly than usual, and of necessity the rebuilding had to be more thorough than was wont. Advantage was taken of the clearance which the fire had made to give the town a better site for its town-house than the old one on the south-east of St. Giles's. A year after the sack, Robert II. granted to the Town Council a site 60 feet by 30, immediately adjoining St. Giles's on the north-west, for a town-house or Tolbooth. The old Scottish term Tolbooth means the booth or office in which the tolls or taxes are gathered, and no better position could be found for the Tolbooth of the town than this, for it was not only beside the town church, and therefore in the centre of the town, but it was on the market-place, from which the "octroi" duties were to be gathered. At this time and onward to 1528, we have proof that the ground to the west of St. Giles's, now partly open and partly occupied by the old County Buildings, was the market square of the town. It was covered with closes in the sixteenth century and again cleared about 1817. Here, then, the Town Council built for itself a house, its southern wall being in line with the northern wall of St. Giles's, before the Albany aisle was added to the church on the north. No record of the building of the Tolbooth remains; it was probably done at two different times and by different masons, for it originally consisted of two parts—Bellhouse and Tolbooth—and these two were of so very different strengths, that while the former lasted into this century the latter was condemned as ruinous and dangerous in 1560, and had to be rebuilt. The name Bellhouse, or belfry, recalls the town belfrys of the old cities of the Low Countries, and the purpose for which they were built—that their bells might summon the citizens together, whether for purposes of peace or war. This town-house of Edinburgh, built some time in the early years of the fifteenth century, cannot have been very large—the size of the site prevented that; it was

probably not very magnificent—at least, the portion which survived into the nineteenth century was not; but it was fated to play an important part not only in the history of the town, but of Scotland. In the Tolbooth during the fifteenth century the Scottish Parliament usually sat when it met in Edinburgh; here, too, were the courts which the royal deputies held for the administration of justice; and here, in 1532, the Court of Session was inaugurated by James V. In the old Tolbooth and in succeeding municipal buildings the Supreme Court sat till the beginning of this century, when the Crown undertook the duty of finding an abode for justice. There is a strange minor key to be struck along with these more stately notes. Upstairs, statesmen were debating or judges administering justice; downstairs, velvets were being measured, or maybe the temper of sword blades tried. A Corporation which had but small funds and much to do with its money had to be thrifty, and so it let the basement of its Corporation buildings for shops; it was so in the fifteenth century, it continued to be so until the end of the eighteenth: Leonard Horner's father, for instance, was a silk mercer in the old Tolbooth.

The Tolbooth, or at least its eastern portion, the Bellhouse, was probably built by the masons who had been employed in extending the church of St. Giles in the year succeeding the great destruction of 1385; but of its building there is no actual mention in Town Council minutes until 1501, when it is noted that the tower of the Tolbooth is being built or rebuilt. The next notices are of a different kind. By the middle of the century the Tolbooth is declared to be ruinous, and the Lords of Session have left it and taken refuge in the Blackfriars Monastery in the Cowgate. Whether it had suffered when the English burnt Edinburgh in 1554, we know not; probably it had, for not a house escaped unhurt, according to the English account of the event. The Town Council repaired the house as well as funds permitted, and it was sufficiently water-tight to receive within its walls the celebrated Scottish Parliament of 1560, which disestablished the Roman Catholic and established the Presbyterian Church.

The Reformation affected the question of accommodation for municipal work in a strange way. The Town Council was strongly Protestant, and it shared the disrespect for church buildings common to the Protestants of the time; so when, in June, 1560, the Reforming party were supreme in Scotland, the Town Council found itself free to do what it chose with St. Giles's Church, in which Roman Catholic worship had been abolished. The Council resolved to screen off the eastern portion of the church for its high school, and the western end for ordinary municipal purposes—for law courts, for town clerk's chambers, and for prison accommodation—considering the rest of the nave and transepts as sufficient for worship. Times were very unsettled, and the city purse very empty; so the carrying out of this resolution was not quickly gone about. The dividing up of the church seems not to have been begun when, in February, 1562, the Town Council received a missive from Queen Mary, instructing it to take down the old Tolbooth as dangerous to the lieges, and build another. At the same time the judges of the Court of Session did their part to quicken the action of the Council by threatening to leave the town and establish the court in the town of St. Andrews. Accommodation for the court was found at once in the Holy Blood Aisle of St. Giles's; and in April the Corporation Master of Works was ordered to pull down a portion of the Tolbooth, and use timber and stones for the building of municipal offices within the western portion of the church. The idea of placing the school in the east end of the church was abandoned. The work was now actually carried out, and the Town Council took possession of the church, nor did it altogether remove the town's offices from it till 1829. Different portions of the building were utilised and for very various purposes. The western portion of the nave, which was partitioned off by a stone wall, was made into a two-storey building, and was afterwards connected with the new Tolbooth about to be built. In this appropriated part of St. Giles's Queen Mary's first parliament met in 1563, the Queen attending in great state. The upper floor was used regularly by the College of Justice, the lower was occupied in different ways at different times—now we read of the Bailie Court sitting in it, at another it is a lumber-room, in which the gallows and the "maiden" are stored. Then in the "roof of the kirk" looms were erected, and here the town's "wobsters" pursued their calling. The "re-vestry," now the Chambers Chapel, was assigned to the town clerk, who retained possession of it until 1811, and extended his domain into the north transept. A charter-house, too, was found for the town's valuable documents over the old south door, in a portion of the church taken down during the alterations of 1830. But even a worse fate was in store for the old town church, when a prison was fitted up on the north side for those taken in adultery. This portion of St. Giles's was for years afterwards used as a lock-up; in the latter days of its degradation it was known as "Haddo's Hole," from Sir John Gordon of Haddo, who had been confined in it, and when it was restored for worship in 1856, the name "Haddo's Hole"

passed to that one of the three churches to which this portion of St. Giles's was assigned.

The Town Council, although it had taken possession of so much of the old town church, did not neglect the Queen's command to build a new Tolbooth. The Queen seems to have insisted on its being done, and we can quite understand how she was impelled to press the Town Council, owing to the dislike which she, as a good Catholic, must have had to the secularisation of a consecrated building. A site for a new Tolbooth was found adjacent to the south-west corner of the church by buying up sundry houses. When the old Tolbooth had been erected, in the beginning of the preceding century, this ground to the west of St. Giles was an open space, the market-place of the town, but since then it had been covered with houses. The building was finished with remarkable expedition, money being raised by a special levy on the citizens and by the mortgaging of the town mills. The fabric of a church was utilised, too, by the purchase of a chapel of the Holy Rood which stood in the churchyard of St. Giles, but was now in ruins, its stones being used for doors and windows. The new Tolbooth, of which no drawing seems to be extant, was occupied by the Town Council in December 1564. It stood where the entrance to the W.S. Library is now, and was a building three storeys high, containing a hall in each of its two lower flats, with other rooms above, which were often let for non-municipal purposes. The lower hall was the usual meeting-place of the Town Council, the upper was used by some of the Law Courts. There the Justiciary Court continued to sit until 1809, long after the other courts had removed into the new Parliament Hall. But the new Tolbooth was used for many other purposes. It was for over seventy years the usual meeting-place of Parliament; in it the General Assembly of the Church sat occasionally, and the Convention of Royal Burghs regularly. Here the Merchant Company was inaugurated in 1681, and here it met until it acquired a hall for itself in 1691. Although it served so many and so various purposes, it appears to have been a small, shabby building. The new Tolbooth was entered from a lane which led along the west wall of the church to what, in 1560, was the churchyard of St. Giles, and afterwards became the Parliament Close. It covered this lane which passed under it through a "pend," and seems to have been built against the west wall of St. Giles. Through this gable a door was made on the level of the second storey, and this formed the communication between the portion of the municipal offices in the west end of the church and the portion in the new Tolbooth. In fact, the name "New Tolbooth" is applied indiscriminately to both, and they were looked upon as forming together the town-house. While the Town Council was building this new Tolbooth, partly in and partly outside St. Giles's Church, the old Tolbooth proper was standing in ruins, a portion of the western end having been pulled down so that its stones and timber might be used for the new Tolbooth. In ruins it remained for half a century, the Town Council being too poor to rebuild it, and needing money too much to pull it down altogether, as that meant expelling its tenants from the shops in the basement and losing the rents they paid. So matters drifted for years; the more dangerous parts of the ruins were taken down, and the tenants were allowed to make their "booths" water-tight—one of these tenants being the father of George Heriot, the founder of the Hospital. At last the Town Council moved in the matter. The country had enjoyed thirty years of peace under the rule of "our Scottish Solomon," James VI., and the town had got a shade less poor; besides, new ideas had sprung up as to the necessity of providing better prison accommodation. The old Bellhouse—the eastern portion of the old Tolbooth, which, being of superior masonry, had not been condemned along with the Tolbooth proper—had been used as a "lock-up" under the name of "The Thieves' Hole;" and in 1610—half a century after it had been condemned by Queen Mary—the ruins of the old Tolbooth were cleared away and rebuilt. To the western gable three "krames" or booths were afterwards attached. These became ruinous, and in 1678 their occupiers got permission to erect where they stood a two-storey building—the Tolbooth being five storeys high. Then the old Tolbooth was made as it appears in all the sketches which we have of it, the roof of this low house being used for years as the place of public execution.

The old Tolbooth, as rebuilt in 1610, was intended for a prison, and as such it remained to the end. It was a quaint old building as described by Sir Walter Scott, or as portrayed in Wilson's "Old Edinburgh" or M'Gibbon and Ross's "Domestic Architecture."

The next extension of municipal buildings after the rebuilding of the old Tolbooth gave Edinburgh a building of which it is still justly proud—the Parliament Hall. The project of building it is first mentioned in a minute of Town Council of March 13, 1632. It relates that "a great number of the honest neighbours of the said burgh" had conferred with the Council, and "regretting that a part of their great church,

which was appointed for divine service, should be applied to secular uses, and withal considering that the lack of convenient and fit rooms within the burgh for keeping of Parliament, Session and Council-house, and other public meetings may procure the same to be abstracted furth of this burgh," the meeting resolved to erect "such specious and necessary houses" as the Town Council shall see fit, after consultation with the most skilful architects. A subscription was at once opened to assist in defraying the cost, and James Murray, master of works to His Majesty, was appointed architect. A site was found by taking down the ministers' houses—the manses of the ministers of St. Giles's, which had been confiscated to the Crown after James VI.'s famous quarrel with them in 1586. The building cost about 10,600*l.*, 3,800*s.* of which was raised by public subscription, the balance coming out of the common fund of the city. The list of contributors with the sums given is still in the hands of the City Chamberlain. The Parliament House was finished in 1639, when Parliament met in the hall. The building was of the Gothic of the time, and consisted of the hall, running north and south, and a wing at the south end running eastward. In the hall the Scottish Parliament sat; in the wing the Law Courts. The building remained unaltered until 1810, when it was faced and the present façade built. In 1640, the year after it was finished, we find it used for a thoroughly municipal purpose, for convening the "whole neighbours" of the town to consult about "the public safety and weal"—it was a stirring time, for the Scottish Presbyterians were at open war with Charles I. In the newly-erected building the College of Justice has sat ever since, although, as was before stated, the Justiciary Court remained in the new Tolbooth until the beginning of this century. In it, too, until the Union, the Scottish Parliament and the Privy Council met. The "Laigh Parliament Hall"—the fine old room below the Parliament House—has been used for many purposes. Cromwell used it to confine his prisoners of war; in it the Covenanters were tried and tortured; part of it was used to preserve the Scottish records; and in 1700 the Town Council granted another portion to the Faculty of Advocates for their library, which now fills the whole and has overflowed into new buildings besides. But the town retained a portion of the Great Hall for its own purposes; for here, until 1798, the Bailie Court was held in one of the strange apartments into which the hall was divided. To the town fell the duty of maintaining the hall and court-rooms until this was taken over by the Crown in 1816. One municipal purpose the hall regularly served—it was used for public meetings called by the Corporation. Cockburn relates how the king's birthday banquet took place in it on June 4, and here many of the principal Edinburgh events were celebrated. As late as 1863 the Corporation banquet in honour of the marriage of the Prince of Wales was held in the old hall, which the city still claims as its property.

After the extension of 1632-39, the municipal buildings remained until the beginning of this century much the same as they were then made, save that the Corporation offices were all turned out of St. Giles's, except the town clerk's department in the north transept. But during this time a great change had come over the conditions of the country, for the Union of 1707 had changed all things in Scotland; the Crown had increased its power, and, unlike the old Stuart kings, could now afford to provide both salaries and house room for the College of Justice. A revolution came, too, after the second half of the century began, on the feelings of the citizens with regard to their places of abode. Of the need for a new council chamber there could be no doubt. The old room in the new Tolbooth is described by Lord Cockburn in his "Memorials," and the picture is not inviting. "It was a low, dark, blackguard-looking room, entering from a covered passage which connected the north-west corner of the Parliament Square with the Lawnmarket." "The chamber was a low-roofed room, very dark and very dirty, with some small dens off it for clerks."

The contemplated improvements, embracing as they did new court-rooms, a hall for the Society of Writers to the Signet, more accommodation for the Advocates' Library, a new prison, besides a town-house for the city, were extensive, and took many years to discuss before they were entered on. There were many parties to please, and among others the Treasury, which was not easy to bleed during the great French war. The beginning of the end of the old Tolbooth was intimated when the foundation-stone of the New Bridewell on the Calton Hill was laid in November 1791, the occupants of "The Thieves' Hole" being transferred to it on its completion. But the other residents in the old Tolbooth were allowed to remain for some years, for the Felons' Prison on the Calton Hill was not finished till September 1817. Then the old Tolbooth was rendered tenantless; the old door and padlock went to Abbotsford, while the cage or "Iron House" was bought by the town of Portobello as a "lock-up" house for that fashionable seaside resort. The old Tolbooth was pulled down. During the same period the new Tolbooth had met a

like fate. It had received warning as far back as 1790, when a plan was drawn up for improvements which included the clearing it away along with the other quaint old buildings, Goldsmiths' Hall, George Heriot's shop, and the closes which blocked the west front of St. Giles. But destruction showed that it had a "slow foot" in this case also, and the negotiations went on without result until 1809. Then the clearance of the space between the Cowgate and High Street from St. Giles's Church westward to Liberton's Wynd was finally agreed on, the new Tolbooth was also condemned, and the Town Council had to seek new quarters for itself. The fact is that for years the accommodation afforded by the new Tolbooth had been found much too narrow for the town's offices, and rooms had been taken in different parts of the High Street. Ever since the Reformation the town clerk had kept possession of the portion of the town's church in which he had then settled, and during the eighteenth century other departments found premises in one place and another. The most curious of these plantations is "The Burrow Room," to which the Dean devotes a short chapter. It was a room which the town held from 1701 to 1741 in one of the high tenements in the south-east corner of the Parliament Close. It was primarily used by the Convention of Royal Burghs, but it served other municipal purposes, and a very strange document is quoted in the Dean's sketch throwing very clear light on the character and habits of Captain John Porteous, who gives his name to the famous Porteous Mob.

The Town Council acted very sensibly in the emergency caused by the destruction of its chambers—it took possession of premises which had been in its hands for years, on the north side of the square, which is still called the Royal Exchange, and there it abides unto this day. How the Royal Exchange was built, and how the north side of its square fell into the hands of the Corporation, is fully told in the account now presented to the Town Council. It is a quaint story of the middle of the last century. It would appear that during the burst of enterprise which followed shortly after the suppression of the Rebellion of 1745, the Convention of Royal Burghs started a movement—intended to be national—for improving the capital of Scotland. Among other improvements it was resolved to build for Edinburgh an Exchange, in which her merchants could meet. Meetings were held, subscriptions collected and a site for the Exchange found on the north side of the High Street, by buying up Mary King's and Stewart's Closes, both of which were ruinous, and neither having a very good repute. Then, in 1753, an Act of Parliament was got, which authorised the scheme and appointed a board of thirty-three directors to control the undertaking, the directors being partly chosen from the subscribers of 5% and upwards, and partly from public bodies, the Town Council having a controlling voice in the matter. The cost of the scheme was about 31,500*l.*, and of this the Town Council was to advance 16,000*l.*, and to receive the north side of the square, which it had been arranged was to be taken over by the Government for a Custom House. Proceedings were commenced on September 13, 1753, by a great masonic and military spectacle, in laying the foundation-stone on the south-west corner of the square, the magistrates gracing the occasion in their velvet coats, as appointed for them by their "kind and gracious gossip," James VI. The building went on slowly, and splendid mason-work the old Exchange was really made. The square was completed, save that the old land in Writers' Court was allowed to remain. But the scheme was not a success financially. The buildings were sold as they were got ready, and the Town Council, although it had not been able to advance more than 4,100*l.* out of the 16,000*l.* promised, retained the side overlooking the Nor' Loch, and let it to Government for a Custom House at a rent of 360*l.* per annum. So the Royal Exchange remained for years, until in the beginning of the century the Government bought a new Custom House, and the Town Council needed council chambers, owing to the Tolbooths, old and new, being doomed to destruction. Quite naturally, the Town Council bethought itself of its property in the Exchange, and so after the matter had been carefully gone into by a committee, and a very clear and sensible memorandum drawn up on the subject, as much of the town property on the north side of the square as was required was fitted up for the Corporation business, and on May 14, 1811, the magistrates and Council took possession of their new place of abode. Here the town-house of Edinburgh still remains, but of late years the Corporation has very properly been steadily buying up the remainder of the square as it comes into the market. The Municipal Buildings require still further extension, and the Town Council seems to be taking the only sensible course in planning improved buildings in the Royal Exchange, rather than in seeking a new site elsewhere. A town like Edinburgh, which depends so much on its traditional importance, cannot afford to break the chain of its historical continuity by removing the home of its municipal life from the centre which it has known as long as its history can be traced to a new town and new surroundings.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.

A PAPER was read at this Association on Friday evening, January 25, by Mr. Horace R. Appelbee, of London, entitled "Preparation of Drawings for the R.I.B.A. Prizes." Mr. Appelbee gave hints as to the best method of preparation, and suggestions on the order in which the various competitions should be taken, so that the study done for one competition might be of assistance in the following year if the student chose to compete for another of the prizes. Mr. Appelbee advised all students under the prescribed age to enter for the competitions, not only for the sake of the prizes, but because of the benefit derived from the necessary study. The paper was illustrated with drawings kindly lent for the occasion by Messrs. W. H. Bidlake, Arthur Bolton, George Kenyon, Frank Verity, and others. After the meeting Mr. A. G. Dunn was entertained at supper by a number of fellow-students of the Association and School of Art, to celebrate his success in gaining the Fugin Studentship.

SCHOOL BUILDINGS.

Blackburn.—In connection with St. Stephen's Mission Church a new, substantial and commodious infants' school has been opened to accommodate 270 scholars, with separate babies' room at one end. An improved glazed folding partition divides the two classes of infants. At the main entrance cloak-rooms and lavatories are provided, the inner walls being lined with white glazed bricks. A special feature has been provided in having the school well lighted, sufficiently heated by hot-water and ventilated on the most modern system. The school is built with Yorkshire parpoints and dressings. The cost, including furnishing, is upwards of 1,000*l.* The whole of the work has been ably carried out by Mr. T. P. Wilson, of Lower Darwen, and local sub-contractors, under the superintendence of the architect, Mr. J. A. Shorrocks, of 3 Simmons Street, Blackburn. Mr. Billington was clerk of works.

GENERAL.

Mr. Howard Pentland, architect, has been elected a constituent member of the Royal Hibernian Academy.

Messrs. Bailey & McConal, of Walsall, have been successful in the competition for the new swimming, Turkish and slipper baths, engine house and laundry, which are to be erected in Walsall at a cost of 7,500*l.*

The Designs by Mr. G. G. Hoskins have been adopted in a limited competition for the new schools to be erected in the parish of Holy Trinity, Darlington, and have received the approval of the Education Department.

A Meeting will be held at Assouan to-morrow between Mr. W. E. Garstin, Professor Sayce, Messrs. Naville, Farmer, Hall, Somers-Clarke, Hogarth and Lyons, to consider the best means of preserving the portion of the temples on the island of Philæ which will be partially submerged by the proposed waterworks.

Mr. Gleeson White will give an address at the meeting of the Applied Art Section of the Society of Arts on Tuesday, the 5th inst., on "Drawing for Process Reproduction," Mr. Lewis F. Day presiding.

Mr. C. H. Godfrey will read a paper at the meeting of the students of the Institution of Civil Engineers, on "The Construction and Maintenance of Roads."

The Surveyors' Institution meet on Monday, the 4th inst., when the adjourned discussion on the paper read by Mr. H. Blackburn on "The London Building Act, 1894," will be resumed.

Mr. J. T. Cackett will, at the meeting of the Northern Architectural Association in the Art Gallery, Newcastle-on-Tyne, give an address entitled "An Evening of Notes," with limelight lantern illustrations.

Mr. Percy Fitzgerald, F.S.A., will lecture on "Adam Architecture in London" at the meeting of the Edinburgh Architectural Association on Wednesday, the 6th inst.

Mr. G. B. Bulmer delivered a lecture on "Ancient Rome" to members of the Leeds Architectural Society. He described the venerable buildings, explaining their construction and good and bad points.

Whittington Church, of which Dr. Pegge, the Derbyshire antiquary, was for many years rector, has been completely destroyed by fire. The cause is supposed to be the overheating of a flue. The church possessed considerable historic interest, and the deeds, registers and plate therein were of great value.

A School of Architecture is proposed to be founded by the Turkish Government in Constantinople, in order to enable the natives to dispense with the Armenian architects.

The Leicester Town Council on Tuesday resolved to expend about 25,000*l.* on an art and technical school, which will be erected on a site belonging to the borough.

The Architect.

THE WEEK.

THE week was not favourable for builders in the law courts. On Monday application for leave to appeal brought by Messrs. GREGAR & Co. in a case where 200*l.* damages were awarded against them was refused. A foreman moved a plank, and a bricklayer who stood on it fell and was injured. The Court held that the mishap was caused by the foreman's act, and that there was ample evidence for the jury when the damages were awarded. On the same day Messrs. LYSAGHT & Co., of Bristol, were sued for 50*l.* damages. Their men were using some hoisting tackle for raising girders, and during dinner-hour a labourer who was employed in carrying planks was tripped by a wire rope and was seriously injured. The jury found for the plaintiff with 30*l.* damages. Mr. WILKINSON, a builder who had been carrying out alterations in a house at Bayswater, failed in his defence of an action brought by a lady. The coal-cellar, it was alleged, was utilised in connection with the work, and the plate being left insecure, the lady in slipping on it was injured. The builder contended that he was not liable, as he had in no way been negligent, and that the action had been brought against the wrong person. He denied that he or his servants had ever dealt with the iron plate which occasioned the accident. A special jury, however, found for the plaintiff, and awarded 85*l.* damages. On Tuesday an injunction was granted (but suspended for two months) by which Mr. BAILEY, a builder at Bushey Heath, was prohibited from using circular saws because they were declared to be a nuisance by a resident.

WHEN Mrs. THORNYCROFT, whose death occurred a week back, began to practise as a sculptor, there were fewer lady artists than in our time. But as the daughter of JOHN FRANCIS, who was one of CHANTREY's assistants, she must have become acquainted with clay and stone at a very early age. After her marriage with THOMAS THORNYCROFT she visited Rome, and became acquainted with JOHN GIBSON. It was through his recommendation Mrs. THORNYCROFT obtained the patronage of HER MAJESTY and the late PRINCE CONSORT, and idealised portraits of princes and princesses are the works with which her name is associated. Figures of four of the royal children as *The Seasons* were among the attractions of the Exhibition of 1851, and at the Paris Exhibition of 1855 the *Girl Skipping* found admiration on account of its technical excellence. Mrs. THORNYCROFT was no admirer of mere prettiness in sculpture, and owing to the scepticism which exists about the merits of works which are used for the adornment of an English palace, her power as an artist was not appreciated as it deserved. She was happy in being able to see that the ideal to which she aspired was realised in the works of one of her sons, Mr. HAMO THORNYCROFT, R.A.

On Friday last an interesting event took place in Edinburgh. The City Treasurer lodged 295,303*l.* with one of the banks in order to discharge so much of the debt on the city as had been incurred prior to 1833. In 1658 Edinburgh owed 54,761*l.* Forty years afterwards it had increased to 73,000*l.* In 1798 the debt exceeded 160,000*l.*, in 1817 the amount was 212,000*l.*, and in 1833 no less than 241,000*l.* In those days the Corporation was an *alma mater* in the fullest sense of the term. Religious instruction, education, the care of the poor were provided and paid for. Large sums were expended in building city churches. St. George's cost the city 38,626*l.*, exclusive of the site. The cost of the four New Town churches, St. George's, St. Andrew's, St. Mary's and St. Stephen's, including the value of the sites, and a sum of 7,626*l.* expended in the repair of St. Giles's Cathedral, amounted to 104,000*l.* That ecclesiastical property is still possessed by the Corporation. The improvement of Leith was also a burden on the city. The University and

High School should also be reckoned among the cares of the Corporation, although the expenses from their modesty would astonish the authorities of Oxford and Cambridge. For many years the college revenues were not sufficient to meet the expenditure, and had to be supplemented by payments out of the Corporation revenues. An investigation in 1835 revealed that the annual expenditure amounted to 2,093*l.* The college revenue, including the interest on a sum of 13,000*l.* lent to the city out of college mortifications, averaged about 865*l.*, leaving a deficiency of 1,200*l.* per annum to be provided by the Town Council. The salaries and expenses of the High School and other schools amounted to 400*l.* a year. An Act which was passed last year has enabled the Corporation to make financial arrangements by which the debt of the city will be reduced by 295,000*l.* The benefit to the ratepayers will be only about $\frac{1}{2}$ *d.* per pound, but Edinburgh is "relieved from an undignified position with regard to a part of her property and revenues," and the keeping of the municipal accounts will become a simpler task.

THE seventeenth annual general meeting of the members of the Royal Scottish Society of Painters in Water-Colours has been held in Glasgow. The annual report stated that the exhibition in November was the most successful exhibition, financially and otherwise, ever held by the Society. The statement of accounts showed the income to be 430*l.* 13*s.* 11*d.*, and the expenditure 382*l.* 15*s.* 5*d.*, leaving a balance at the credit of revenue account of 47*l.* 18*s.* 6*d.* Balance at the credit of capital account now amounts to 888*l.* 13*s.* 7*d.*, an increase of 89*l.* 18*s.* 6*d.* during the year. The following officers were elected:—President, Sir FRANCIS POWELL; vice-president, W. M'TAGGART, R.S.A.; treasurer, A. K. BROWN, A.R.S.A.; auditors, W. YOUNG, R.S.W., and GROSVENOR THOMAS, R.S.W.; members of Council, R. M. G. COVENTRY and WELLWOOD RATTRAY representing the west, and JOHN MUIRHEAD and ROBERT ALEXANDER representing the east of Scotland.

THE position of architects when "Ireland has her own again" may be anticipated from an action which was brought on appeal before the Queen's Bench Division in Dublin on Monday. Mr. THOMAS BERRY prepared plans for labourers' cottages, and did other work in connection with the Act by which money is granted for those most needed of structures. His services extended over several years. The employers were the Guardians of the Shillelagh Union, a name that must inspire terror in all men who have frangible skulls. When the bill, which amounted to 314*l.*, was sent in, they refused to pay it, and when brought before the Courts they contended, in a characteristic way, that it was within their rights to dismiss an architect whenever they pleased and withhold all his remuneration. However, they lodged 90*l.* out of deference to English law, and, we suppose, congratulated themselves that a good time was coming when equity of another class would prevail. The claim was assigned to the consideration of one of the masters, who allowed 78*l.* in addition. Mr. BERRY will therefore receive a little over a half of the sum he earned, and we suppose creditors of the well-armed people of Shillelagh would say he ought to consider himself to be unusually lucky.

THE Spring Exhibition of works in black and white and water-colours will be held in the Walker Art Gallery, Liverpool, during March, April and May. There will be a special room for architectural drawings which will be arranged by Professor SIMPSON, the principal of the School of Architecture and Applied Art. The limit of wall space in the room allowed to each exhibitor will be 30 square feet. The following are admissible:—Drawings to scale, plans, elevations, sections, &c., mounted on strainers; drawings to scale, framed and glazed; perspectives, if accompanied by plan or plans, either on strainers or framed and glazed; photographs of executed work, if accompanied by plan or plans; measured drawings or sketches of old work, mounted on strainers. All works are to be delivered not later than the 20th inst.

WHAT IS ART?

THE claim to have acting "classified officially among the fine arts," which Mr. HENRY IRVING advocated at the Royal Institution, may have compelled some among the auditory to ask themselves what is art, and how are the fine arts differentiated from the useful arts and the dramatic art? If so, the querists must soon have discovered that a reply was not readily forthcoming. Probably to no men are the questions more puzzling than to artists and those who possess familiarity with the theory and history if not with the practice of the arts. The late Sir DIGBY WYATT came the nearest to mastership of the arts of all men in England during the present century, yet when he was called upon to answer them, with all his ability and experience he shirked the duty. In his introductory lecture as the first SLADE Professor at Cambridge, he said:—"In attempting to answer the question of 'What is fine art?' it would be unwise and unprofitable to lead you into any metaphysical fogs; and it is preferable to seek a solution of the question in the observation of man's practice, rather than in an investigation of his perceptions and intellectual affinities." Where Sir DIGBY WYATT feared to tread it is, of course, hazardous for a weaker man to enter. But as long as metaphysical fogs prevail, it is perhaps allowable that unexpected claims for recognition as artists should be uttered by men who used to be known by different titles, like the needy tailor who lately startled the Chief Justice by describing himself on oath as "an artist in cloth."

Mr. IRVING can therefore claim excuse for any lack of precision which may be found in his definition of fine art, or in his ideas of the advantages which would arise to himself and his brethren by any formal and official recognition. It is evident that, like Sir DIGBY WYATT, he prefers to seek solutions of the questions in men's practice. According to Mr. IRVING, acting is part of human nature, and is the method of education established by nature; like the recognised fine arts, it implies a knowledge of the powers of nature, and the systematisation of them in such a way that effects might be recurrent as required. Whatever was essential to poetry, music, sculpture and painting was also essential to acting, and it seemed irrational that HOGARTH's *David Garrick as Richard III.* should be accepted as a work of art, while to GARRICK's interpretation of the character that title was denied.

We suppose Mr. IRVING will allow that GARRICK was indifferent to the distinction which is now coveted. He looked on himself as a greater man than HOGARTH, and as superior to his old tutor, SAMUEL JOHNSON. If it had been proposed that GARRICK was to be attached to the Royal Academy as professor of posing and grouping he would probably feel aggrieved. A man who was able to look forward to a funeral in Westminster Abbey, surrounded with all the pomp the art of the undertaker could devise (there were six black horses to each coach, says the chronicle), was not likely to covet association with the notabilities of St. Martin's Lane any more than with the notabilities of Grub Street. Both classes of men were eager to flatter him, or as GOLDSMITH said, to be-ROSCIUS him. The arts in those days were not much esteemed, and we are inclined to doubt whether, if they were now as then, Mr. IRVING would be ambitious to be classed officially with their representatives. The great question, however, is, Would GARRICK have been a better actor if some official stamp were placed upon him or his name entered in a record of some circumlocution office? Was it not worthier to be represented with his arm round SHAKESPEARE's bust as if he were the guardian of the dramas, and to expect that one day "Old SHAKESPEARE would receive him with praise and with love"?

The question still remains to be answered why a picture may be more important than its subject, or how a painting of a cabbage may attain the value of many acres of cabbages. We must esteem, in the first place, the victory which the arts of painting and sculpture gain over time. Vegetables and actors, like other living things, are doomed to vanish; art furnishes a substitute for them, although the artist himself must share the common doom. The actor, it is true, holds the mirror up to nature, and, it may be, more faithfully than any painter, but the representation is only evanescent.

According to contemporary accounts GARRICK's attempt to realise King RICHARD was very impressive. Unfortunately, it cannot be recalled. The traditions of his interpretation are so vague as to be valueless, for no actor or professor of elocution would venture to say how he expressed the terror of the tent scene; while HOGARTH, on the other hand, has recorded one of his attitudes, and with the aid of fate and reproductive processes that attitude has gained immortality. Other painters and engravers have preserved for us his appearance in different scenes, and copies have gone the round of the world. But the voice that was so varied, natural and affecting is for ever dumb. There is the real pathos, the tragedy of the actor's life, the true paradox of the comedian. The booth outlasts him. SCHILLER, in that noblest of all prologues, excites sympathy by the contrast between the player and his surroundings. The old Weimar theatre had been furbished up for "Wallenstein," or, as he said, it had rejuvenated itself, and was destined to witness the triumphs of many young performers, as it had in past years. But of the wonderful art of which it was the temple no trace was to remain, no crown of immortality awaited the actor; the magic was only for a moment. As poor ADRIENNE LECOUVREUR is made to say by SCRIBE, "Rien ne survit à nos autres—rien que le souvenir." That souvenir has been preserved by art and literature. IFFLAND will always appear to lovers of SCHILLER as "ein edler Meister," unless they read the actor's sentimental dramas. ADRIENNE continues to be pitied, and GARRICK remains the glory of the English stage. But how was death conquered? Mr. IRVING would say through the merits of the performers. Is not ROSCIUS, he asks, a name that lives in history, though he was neither poet, nor sculptor, nor painter, nor architect, nor musician? He forgets that the comic actor owes his fame to an oration of CICERO. There must have been more of the antique Roman in ÆSOPUS, but as he was connected with no big financial case, he is as a phantom to us. On how many actors has one essay of CHARLES LAMB conferred immortality? JACK BANNISTER, MUNDEN and ELLISTON found other eulogists, but without ELIA who in our time would recall BENSLEY, DICKY SUETT, DODD, KING, the PALMERS and the rest? Who can now forget them?

Mr. IRVING made merry over the works of the artists among whom there is no formal and official recognition of actors. He asked in his most withering tone:—"Where is the mighty city Babylon, with its walls and temples and gardens?—gone. Where is the mighty statue of *Olympian Fove*, the triumph of PHIDIAS?—gone. Where is the Temple of Diana?—gone. Where is the Mausoleum of Artemesia?—gone. Where is the Pharos of Alexandria?—gone. Where is the Colossus of Rhodes?—gone. Ay, and gone with them millions of art works by myriads of workers in countless ages—men now nameless, but once full of honour, and whose work was and is placed in the existing category of the arts." That is the inevitable law, but if the works he mentions are now in exactly the same position as the art of the actors who have made their exits, they at least survived for ages, and for that we ought to be thankful. Where all the odds are against us, the smallest gains are welcome.

The truth is Mr. IRVING put the actor's art on its worst basis when he attempted to compare it with works in stone or bronze, on canvas or paper. They are records of men's power enduring for a time if not for all time. We might say the artists who produced them, like the authors of books, were actors, who were not compelled, like those who trod the stage, to be avaricious of the present, as there was no future for them. REYNOLDS advised the Academy students to imagine they were MICHEL ANGELOS and RAPHAELS when about to treat a pictorial subject, "as if the tragedy were played in jest by counterfeiting actors," and that sort of simple histrionics, the putting oneself in the place of some supposititious man, is common enough in all the artists. It was a facility which M. TAINE found to prevail more generally among young artists than any other. But there is something more than applause as the record of so fine a frenzy, for by its means works of art are produced. The painter, the sculptor, the architect, even the musician, can create. Their works are not baseless fabrics which dissolve like a dream, while the glorious creations of the actor are as unsubstantial as PROSPERO's pageant,

"cloud weavings of phantasmal hopes and fears." When there is so vast a difference between the results of their art and those of other men, how can actors expect to be classified officially with painters, sculptors and architects?

When he says that a sculptor's talent can be as well exhibited in modelling a piece of butter as with harder materials, Mr. IRVING we fear will make the judicious grieve. If sculpture were produced only in stuff that was easily dissolved, the art would be in the same category as acting. Men would grow weary of the failure of their endeavours to preserve the creations. They treasure wax models by great artists on account of their rarity, and the care that had to be taken to keep things so frail from succumbing to time; the models also have the advantage of being the genuine, the unaided works of their authors; but a sculptor who insisted on abandoning the use of all materials except wax would soon discover his patrons were only to be found among the showmen. Ours is a material world, and the arts like most mundane things must be subservient to the omnipotent principle of property—

Proputty, proputty's ivrything 'ere, an' Sammy, I'm blest
If it isn't the saäme oop yonder, fur them as 'as its the best.

When the art of the tragedian or comedian has attained a money value in CHRISTIE'S rooms, it will be time enough to hanker after official classification.

But if their art is not embodied in a form that can be assessed for probate and other duties, the actors have compensations enough. They have the exalted privilege to be the interpreters of dramatists, and, as there can never be any official classification for those mysterious or miserable beings, how can actors expect a different fate to their inspirers? They should remember, also, how limited is the scope of all the official fine arts. The majority of those arts can only gratify the eye. But the actor, with the aid of the writer, can sway men's feelings and intellects. To anyone who saw GARRICK as RICHARD III., HOGARTH'S picture must have been as cold and disappointing as MACLISE'S *Macready as Werner* now appears to all who can recall the old master in his declining days, when he played to empty benches, manfully struggling against himself to discharge a duty and conquer the weariness of life. No painter's work can express a tithe of the sadness which MACREADY imposed on all who saw him in that character. On such occasions, the actor who has the genuine gift becomes a magician. Then it is, as JULES JANIN finely said, "Est deus in nobis"—each of the spectators is the god who kills or who saves, who holds the sceptre or the thunderbolt, each submits to the great art, because it has its principle in the soul and touches whatever is in the heart of man, however deeply concealed. At such a time how powerless is painting or sculpture! If to represent the two brothers who ruled in Denmark portraits by RAPHAEL and TITIAN were hung on the canvas wall, would the scene between the son and the mother become more terrible? If a genuine polychrome statue by "GIULIO ROMANO" were placed in the niche in PAULINA'S house, would anyone care to see the remorse of LEONTES before it? Or, to leave imaginary cases, can we believe that the *Polyeucte*, when seen lately in the great Roman theatre at Orange, moved spectators more than when played in the Théâtre Français? Painting, sculpture and architecture must hide their diminished heads before the Tragic Muse, yet knowing this we see one of her priests forgetful of her importance, and craving to be "classified officially among the representatives of the fine arts." If MELPOMENE forgives him she also has become one of the decadents of the end of the century.

NOYON CATHEDRAL.

THE importance of Noyon Cathedral in the history of Gothic architecture was suggested by DE CAUMONT nearly sixty years ago, when he described it as an excellent example of the Transition style belonging to a time when Gothic architects made use of forms and accessories which were Romanesque. No less emphatic is FERGUSSON'S judgment, and what he says is the more remarkable because of his bias against Gothic:—"The cathedral of Noyon is one of the best and most elegant Transition specimens in France, having been commenced about the year 1137, and

completed as we now see it in 1167. Here the circular arch had not entirely disappeared, which was owing to its early date, and to its situation near the German border and its connection with the see of Tournai, with which it was long united. Like the sister church of that place, it was triapsal, which gave it great elegance of arrangement." There is, we need hardly say, a difference between the two buildings (which are ninety miles apart) in the position of the apses. The choir or chancel at Tournai is almost double the length of the Noyon choir, and as the apsidal ends of the transepts are so far from the chancel apse their relation is likely to be overlooked at Tournai, whilst at Noyon it becomes evident from a cursory glance. There is no less important a difference in the manner of constructing the apses, which M. CORROYER describes as follows:—

In France we shall find no example more deeply interesting than Noyon, which at the date of its construction (the last quarter of the twelfth century) formed, as it were, an epitome of the advance so far made by the architects of the Ile de France. In this curious building we find a fusion of the antique tradition developed by the Normans in their triforiums, and of the Angevin methods, as manifested in the groined vaults derived from domes; methods further protected by the example of La Ste Trinité at Angers; in other words, by the adoption of intersecting arches planned on a square, the thrusts of all being received on the main piers, reinforced by an intermediate transverse arch. And we note the appearance of the detached semi-arch beneath the roofing of the inferior aisles merging at its springing into the lateral *arc doubleau*, and so resisting the thrust of the intersecting arches and transverse arches of the nave. It has been said that Noyon was suggested by Tournai, doubtless on account of their superficial affinities. But the likeness is merely in general aspect, the methods of construction being wholly different. At Tournai the apsidal transepts are vaulted upon transverse arches of great strength, and upon radiating semi-arches united where they meet by a ring of voussoirs set horizontally, and at their springing by vaults keyed into their mass, an ingenious arrangement which recalls the vaulting of the "Salle des Capitaines" over the porch of the monastery church at Moissac. At Noyon we have groined vaults, the intersecting arches of which demand the reinforcement of abutments either concealed or apparent, to sustain the thrust of these vaults over the lateral *arcs doubleaux*.

Although the building possesses so much interest as an example of construction, it is less known to students of architecture outside of France than it merits. Noyon suffers from its position. Amiens, Laon, Coucy, Beauvais and Rheims, which form a sort of circumference for the circle of which it is the centre, are held to be more attractive, and by most strangers are first visited. Noyon is left over and then it is found there is no time for the study of the building. The exterior of the cathedral is rather sombre, and the two towers are suggestive of defence. The prelates were sometimes of a militant class, and at Noyon they possessed the power of feudal lords. The arching of the windows does not suggest the buoyancy which those of a later period generally inspire. The porch is vast, and appears to be adapted for ceremonies no less than for sheltering a crowd. The first sight of the interior is impressive. The piers and arching are rigorous in their plainness, and the sculptured ornament is generally strictly conventional, but the proportion of the parts is satisfactory, and there is an expression of repose about the nave which can hardly be disturbed by glimpses of chapels with the tawdry decoration which pious people admire. The alternation of square with cylindrical piers does not appear discordant, but rather as an effort to secure quietness of effect. What appears surprising is that, unlike the majority of buildings, the progress of development is not easily to be traced as we ascend. The lower arcades have more analogy to pointed arches than those which are found at a higher level. It is not easy to understand how the peculiarity has arisen, unless we imagine that we see in the round arches the work of a time of which they were not the characteristic. Is there any evidence to support the theory that the builders of Noyon, like those of our day, sacrificed the present to the past?

As a city Noyon resembled those people who are not born for good luck. It might have given its name to a special variety of misfortunes, for it was not only left defenceless to invaders, but it was periodically subjected to fires which arose within its own buildings. If it were argued that the gloomy views of life which were always before the most distinguished of the citizens, JEAN CAUVIN, were the consequences of belonging to a family that had suffered much in Noyon, believers in heredity and the

influence of exterior circumstances on thoughts would be likely to agree with the conclusions. The earliest bishop of the see who was a historic character was Saint MEDARD, who lived in the early part of the sixth century, and he gained his fame by his efforts to save his flock in Noyon from the onslaughts of barbarians. Saint ELOI, who was one of the bishops in the next century, was a famous metal-worker and professor of art. He was, moreover, prime minister to DAGOBERT, but, however busy, he was compelled to spend a part of his time in trying to raise money in order to free slaves from captivity, and the last circumstance suggests the risks which awaited residents in Noyon. In the ninth century Bishop IMMON was among the victims who were massacred during one of the invasions of the Normans. We hear of elections of bishops by the people and of other bishops they opposed. So constant were the quarrels between the inhabitants and the cathedral authorities, it was a stereotyped entry in the capitular records that peace had been again entered into between them, "*de pace facta inter nos et burgenses Noviomenses*," and the number of entries about a truce is evidence that peace was not enduring. In 1108 Bishop BAUDRY granted a sort of charter to the townspeople. A few years afterwards there was a tumultuous conspiracy on their part, "*turbulenta conjuratio factæ communionis*," to coerce one of his successors to accept their interpretation of the conditions.

The fires were numerous in Noyon, and the cathedral was sure to suffer. In 1131 the building was destroyed. In consequence of that catastrophe the see was separated from Tournai. Twenty years afterwards there was another fire. A new building was commenced in the episcopacy of BALDWIN II., who was a friend of Saint BERNARD, and would as such believe in the necessity of severity in churches. The building was completed in the time of STEPHEN I. In 1293 there was another fire, when nearly all the churches of Noyon were destroyed. During the sixteenth century there were three conflagrations, the last being on the occasion when the Spaniards attacked Noyon, which was valiantly defended by a band of Scotsmen, but they were overcome by numbers. All the canons had abandoned the cathedral. Apparently some of the inhabitants believed it was sacred and fled to it as a sanctuary, but there was slaughter within it, and it had to be purified when the canons returned.

It may be assumed that no part of the building can be of an earlier date than 1151, and it is doubtful whether any important part was erected at a much later period. The fires after the twelfth century, which appear so terrible on the records, cannot have caused much injury to the building. If there was rebuilding the customary practice was not observed, for in Noyon there is no variety of styles. With the exception of some of the side chapels the building may be described as representing no more than two styles; it would be more correct to say it consists of two phases of a Transitional style, and that the later first appeared. It is held that the notion of motion should be excluded from geometry, and that it is unworthy to imagine that a geometrical line is formed by the revolution of a geometrical point. It is considered also that we must not think of contests in connection with masses of masonry. But at Noyon it might be supposed that the tendency towards thirteenth-century lightness was arrested; columns and arches consequently show opposing influences, and finally the newer fashion was compelled to succumb to the more ancient. If we could believe that the new designers were laymen while the elders were clerics, the peculiarity of Noyon would be explained. As we have seen, it was a place where conflicts were known. The civilians and the canons were in opposition, while on the bishop, as a sort of combination of spiritual and secular power, devolved the troublesome office of arbitration. Does not the architecture of the cathedral suggest compromise as well as contests? There are parts of the building which in other districts of France at the end of the twelfth century would be considered as obsolete in style, and it is plain that the men who designed the work were aware it was obsolete, but they submitted to some power which could control them.

The apses of the transepts are examples. Possibly in the more ancient cathedral of Noyon that arrangement

existed, while some suppose it was retained out of affection for Tournai. It is evident, however, there was no symbolic or ritualistic advantage in making the transepts end in a semicircle, for otherwise the examples would not be so few in France. When we find marked peculiarities of that sort we are justified in supposing that some exceptional influence held sway, and for that reason we consider that the cathedral of Noyon has an interest which is absent from later, and it may be more beautiful, examples of French Gothic.

YORKSHIRE ARCHÆOLOGICAL SOCIETY.

THE thirteenth annual meeting of the members of the Yorkshire Archæological Society was held on January 31, at the Town Hall, Leeds. Colonel Wilson presided. The following is the annual report:—

The Council of the Yorkshire Archæological Society, in presenting their thirtieth annual report, feel that much good work has been done during the past year, which has seen the issue of the fiftieth part of the Journal. The Council look upon this with legitimate pride, and feel sure the volumes will be an invaluable help to all students of Yorkshire antiquities. In the forthcoming part will be commenced a new translation of Domesday Book for Yorkshire, which will be accompanied by copious indices of persons and places—a work which cannot fail to be of great use. During the past year a new departure was made in having a two days' excursion to York. This experiment proved eminently successful, and the thanks of the members are due to the Right Honourable the Lord Mayor, the Hon. and Very Rev. the Dean of York, F.S.A., the Rev. Chancellor Raine, D.C.L., and the Town Clerk, as also to Mr. W. H. St. John Hope, Mr. J. T. Micklethwaite, F.S.A., and Mr. John Bilson, F.S.A., for their lucid explanations of York architecture and glass. The Council of the Royal Archæological Institute propose to make Scarborough their centre for excursions in the present year. Your Council have been invited to join them, and it has been decided to accept the invitation. In the list of additions to the library will be noticed the important gift by the Harleian Society of forty-five volumes of their publications. The library is also increasing daily by the addition of the volumes received in exchange from the corresponding societies. This, and the rapid growth of the Society generally, render it imperative that steps should be taken to obtain rooms in some central position in Leeds, where the library could be housed and meetings held. During the year 37 new members have been elected into the Society, which now numbers 4 honorary members, 177 life members, 428 annual members and 27 corresponding societies—a total membership of 636. With regard to the Record series, only one volume has been issued during the year, namely, Volume XVI., containing the Yorkshire portion of the Lay Subsidy, collected 25 Edward I. This volume has been edited by Mr. W. Brown, who has another volume of Yorkshire Lay Subsidies in hand for the Society. Mr. Brown is also preparing another volume of inquisitions for publication, and it will probably form one of the volumes for the year 1897. The next volume of Lay Subsidies will, it is hoped, be issued in 1896. The second volume for 1894, Mr. Baildon's volume of notes relating to Yorkshire monasteries, is nearly ready for issue. It was hoped that this volume would have been in the hands of subscribers some months ago, but unexpected and unavoidable delays have arisen, for which the indulgence of subscribers is asked. The volumes for 1895 are now in hand. They will be (1) a further instalment of the "Index of York Wills," which has been prepared by Mr. A. Gibbons, and will be edited by Dr. Collins; and (2) a further instalment of the "Royalist Composition Papers for Yorkshire," which will be edited by Mr. J. W. Clay. It is hoped that both of these volumes will be in the hands of subscribers before the end of the year. It will be seen from the balance-sheet that the York Wills Fund is now nearly exhausted. After paying for the volume of index, now being prepared by Mr. Gibbons, and for the alphabetical arrangement of the volumes, the balance in hand will be very small. Further subscriptions, therefore, are needed in order to carry the index up to the year 1636, as suggested in the report for 1893. The number of subscribers to this series does not increase, and the average number (about 170) is far less than was expected when this branch of the Society's work was instituted. It was then confidently hoped that 250 subscribers would be obtained without difficulty, but this hope has not yet been realised. If all the patrons and all the members of the Council would become subscribers, there would be a substantial increase in the number. At present the subscriptions barely pay the cost of printing and postages, and therefore there is no fund available for copying purposes. The Society, therefore, is dependent on the kindness of friends for the preparation of the volumes issued to subscribers, and if, unfortunately, these friends should

happen to fail us, the publications of this series will have to be considerably reduced.

The Chairman, in moving the adoption of the report and balance-sheet, referred to the item for printing in the latter. It might seem a large sum of money, 223/, but he had no doubt they were all well pleased with the Journal. They would all be glad to see the appearance of what he might call a translation of the Domesday Book, which had been before the public for many years, but was not in as complete, accurate and intelligible a form as the new edition would be when finished. With regard to the Record series, the balance-sheet showed that the special subscriptions for indexing the wills at York were very nearly exhausted. He believed that every one would be glad to see those wills approaching completion. Colonel Wilson, referring to the suggestion in the report that they should have a room in which to house their books, &c., said he had felt for a long time that this was a necessary step to take if they were to expect the Society to progress even at the same rate it had hitherto done. So long as they had a library stowed away in a more or less inaccessible spot, and had no place which they could call their home, they were to a certain extent an outcast Society. If the Thoresby and kindred societies could be induced to share the expense of the enterprise, it might perhaps be brought within the limits of their somewhat slender means. If they had a home, they might be able to look forward to the gift of objects of interest. They were now possessed of a library, but beyond books they had little, if anything, of interest relating to the county. There were any number of engravings and maps, which would be of interest; even Roman altars were dug up now and then, like the one from the bed of the river at Castleford, which, he was glad to say, was now safely housed in the Philosophical Hall at Leeds. He felt that if they could only provide a place for their books, and in which they could hold their meetings, they would be in a position to invite the generous to make them gifts. The Council, he added, would be glad to have an expression of opinion on the subject, and he hoped before long that they would have a tangible scheme to place before them.

The following members of the Council were re-elected:—The Rev. J. T. Fowler, F.S.A.; the Rev. Canon Isaac Taylor, LL.D.; Lord Hawkesbury, F.S.A.; Mr. W. P. Baildon, F.S.A.; Colonel Wilson, F.S.A.; Dr. Leadman, F.S.A.; Dr. Carter Mitchell, F.S.A., and Mr. John Stansfeld.

HERALDRY.

ON last Saturday Mr. Robin Allen delivered a lecture at Toynbee Hall on Heraldry. Historical records, he stated, afforded no clue to the earliest devices in the shape of family pennants and coats-of-arms, but there was little doubt that the plumes and other symbols used by knights and feudal chiefs, to enable their followers to rally to their respective standards, had led to their subsequent adoption in the shape in which they had been handed down to posterity by the mail-clad warriors of earlier times. There was, however, much that was at least singular in the way in which some well-known and classic symbols had originated. What afterwards became the Roman eagle was originally a wolf, and the eagle did not supplant this ancient symbol until the consulate of Marius. During the Middle Ages heralds were appointed by monarchs and were known by their heraldic names, the higher titles such as kings-at-arms being conferred as rewards of merit and long service. These kings-at-arms were charged with the registration of the arms assumed by the nobility and chivalry of their day, and they also had power to award military honours and to decree the punishment of unknighly deeds. The impetus given to the religious and martial spirit of European chivalry by the Crusades had a good deal to do with the way in which the machinery of feudal warfare was methodised, and with the modes adopted of distinguishing and defining the followers of the leading warriors. To keep the men belonging to the respective chiefs together they had to be badged, and these badges were of a character embodying the personal symbols of the different knights. When the same sort of ornaments or symbols were selected by more than one chief, it became necessary to vary their appearance by alterations both in form and colour, which probably accounted for the blue boars and red lions so often heard of. The tints affected by heraldry were blue, red, green, black and purple, and the two metals which were distinguished from the heraldic colours were or (or gold) and argent (or silver). To these furs were added—ermine and vair, the latter being an imitation of the peculiarly marked throat of the northern squirrel. A peculiar feature resorted to in the use of armorial bearings was the adoption of supporters by which the knightly shield was upheld or guarded. Some of the early English monarchs had griffins and eagles, then a leopard and a unicorn, until at last a national symbol, which existed to the present day, was found in the lion and unicorn. Flags and banners of all kinds were of very ancient service, and their

adoption in the Royal and mercantile marine was of the greatest importance. The lecturer concluded by explaining how the Union Jack of Great Britain and Ireland was a combination of the three crosses of St. George, St. Patrick and St. Andrew, and by also describing the national flags of the chief countries of Europe.

ARMENIAN ARCHÆOLOGY.

A CORRESPONDENT sends to the *Manchester Guardian* the following interesting communication:—

At the present time, when the condition of the Armenian subjects of the Porte is exciting so much attention, it may be of interest to ascertain a few facts as to the ancient history and archæology of the Armenian kingdom. Few persons are aware of the existence of any Armenian history beyond the worthless jumble of ecclesiastical and late Greek tradition contained in the chronicle of Moses of Khorene, and the fact that ancient records of the kings of Armenia exist as far back as the middle of the ninth century before the Christian era is known only to those who have studied the more recent results of Assyriological research. The existence of rock and other inscriptions in the provinces of Central Asiatic Turkey was first noticed by the French traveller Saint Martin in 1823, and the first step in exploration was taken in 1826, when the French Government despatched Professor Schultz on a mission to study the archæology of the district and to copy inscriptions. The results of the expedition were unexpectedly rich, for Schultz copied more than forty inscriptions; but unfortunately the brilliant *savant* lost his life in the work, being assassinated on the Persian frontier in 1829. From time to time travellers in the regions of the head waters of the Tigris and Euphrates continued to bring home copies of fresh inscriptions, and in 1850 Sir Henry Layard spent some months in the region, and copied a large number of the rock and other inscriptions. It was then ascertained that over a large area, extending from Malatiah, on the Upper Euphrates, to the neighbourhood of Hassan Kaleh and Toprak Kaleh, near Erzeroum, and as far south as the Keli-sheri Pass, near Mount Rowandiz, in Western Persia, there were records written in a cuneiform character which was not that of the Assyrian empire or of the later Persian monarchs. The inscriptions presented a strong resemblance to those which Layard had found at Nimrud, and which were the records of the kings of the Middle Assyrian empire, extending from B.C. 900 to 750, there being only some slight palæographical variations. It was this close resemblance which led Dr. Hincks in 1847 to attempt the work of decipherment, and he succeeded in reading the names of most of the kings and of many of the place names recorded in the texts. Little progress was attained, as the language of the inscriptions, when deciphered, presented a tongue to which no existing analogue was known. Lenormant, who neglected no branch of cuneiform literature, and with the ardour of a Frenchman rushed in where others feared to tread, published an elaborate analysis of the inscriptions in 1871, and suggested their connection with the pre-Aryan or Alarodian tongues of Western Asia, now represented by the Georgian and especially the dialect of the Laz tribes near Batoum. The progress of decipherment was much hampered by the idea, prevalent in the minds of Mordtmann and others, that the language of the inscriptions was in some way related to the present Armenian tongue, which is a distinctly Aryan language. In 1880 the brilliant but ill-fated M. Stanislas Guyard, a pundit in Oriental languages, made an important discovery. Already having noticed the close analogy there was in arrangement between the Vannic inscriptions and those of the kings of the Middle Assyrian empire, he proceeded to analyse the groups, and was able to decipher a considerable portion of the shorter inscriptions. He was followed shortly after by Professor Sayce, who published translations of the greater number of the inscriptions in the *Journal of the Royal Asiatic Society* in 1882.

The conjecture of Lenormant was found to be in the main correct, that the inscriptions were in a dialect presenting some, though not many, affinities with the Georgian. The story revealed by the inscriptions is a remarkable one, and is, indeed, almost without a parallel in Oriental history. The district, which may be roughly described as the vilayets of Van and Diarbekir, lying between the shores of the lake of the former name and the head waters of the Euphrates, was known to the Assyrians as the land of Uradhu or Ararat, and was first invaded by the Assyrian armies under Dayan Assur, the tartan or commander of the armies of Shalmaneser II., in B.C. 833, who defeated Seduri, king of Ararat. This monarch is evidently the Sar-duris whose inscription is found built into the wall of a ruined church at Van. This inscription reveals a remarkable fact. It is not written in the Vannic tongue, but in Assyrian, and the king calls himself "king of the land of the Nairi," another name for this region of the head waters of the Tigris and Euphrates, which in turn is replaced by the name

of Baina in the native inscriptions of later kings. The text of the tablet is an exact copy of the formulæ of the inscriptions of the Assyrian kings Shalmanesar and Assurnazirpal. The interesting discovery then revealed to us is that the Assyrians who conquered Armenia in B.C. 833 placed, as we know, tablets recording their victories upon the rocks, and that the Vannic rulers were anxious to have the same records, but apparently had no writing of their own. In order to gratify their desire, therefore, they employed Assyrian scribes to write the inscriptions in the same style as those of their masters. In the next reign, however, that of Ispuinis, the scribes had succeeded in adapting the Assyrian notation to the native tongue, and in that language they were inscribed for the benefit of future generations. The process of borrowing was a most remarkable one; not only were the simple characters of the Assyrian selected, but whole groups of ideograms also, representing such common words or phrases as "horse," "chariot," "cattle," &c., and it was the occurrence of these with the variants occasionally given which rendered the process of decipherment more simple. The period covered by the inscriptions is a most important one, embracing about ninety years (B.C. 833-743), during which, owing to the weakness of Assyria, our knowledge of Western Asiatic history is extremely meagre. The continuous wars of Assurnazirpal and his son, Shalmanesar II., had restored the Assyrian empire to its former greatness, and the whole of Western Asia was subject to their power. As is the case with most Oriental empires, a period of weakness soon followed, on which Assyrian history, which never records reverses, is silent.

It is this period that is filled by the records of the Vannic kings. The ancient name of the kingdom was Baiana, which has been corrupted into Van, but the capital seems to have had the name of Dhuspas, which still survives in the modern Thosp, now the name of the district around Van. The inscriptions present no indications of a literary style, being little more than the enumeration of the amount of booty taken in the raids of the Vannic armies. These raids, however, are not without interest, for they show the existence of two important States in Western Asia—the Hittites and the kingdom of Milid, the modern Malatiah. Both of these kingdoms attained to considerable power during the ninth century before our era, and remained formidable until B.C. 717, when they were reduced to the position of Assyrian satrapies. In the reign of Argistes, which may be placed about B.C. 770, the Vannic kingdom was sufficiently strong to attack Assyria and to inflict a defeat on the armies of Assur. In his inscription the king says, "To the Khaldesis [gods of Van] I prayed, to the supreme powers who had given the armies of Assyria as a present to the race of Argistes." On the revival of Assyria the power of Armenia declined, and in B.C. 708, at the latter end of the reign of Sargon, the country was reduced to the position of an Assyrian province. The most remarkable feature of the campaigns recorded in the inscriptions is the fact that they are just such raids as are now and have from all time disturbed the country. Thousands of sheep, oxen and horses are carried off and men and women slain, and even outrages such as are now mentioned are recorded in the inscriptions. Three events combined to bring about the overthrow of the Armenian kingdom, first, the invasion of the Gimmerians, or Kimmerioi, in B.C. 680; then the gradual westward drifting of the Aryans, first the Medes and later the Persians. It is, however, very important to notice the prominent part that this little-known kingdom played in their influence upon the conquerors. Just as it was the setting up of inscribed records on the rocks by the Assyrians which led the kings of Van to adopt the cuneiform mode of writing, so it seems that it was the sight of the numerous rock inscriptions of the Vannic kings Menuas and Argistes that induced the Persian kings to set up their rock tablets. On the rock citadel of Van, by the side of the inscriptions of Argistes, is a tablet bearing a long inscription of Xerxes, but which, the king tells us, was originally prepared for his father, Darius. In another and even more important manner the Armenians exercised a great influence upon their Aryan conquerors. One of the greatest puzzles of Oriental archæology has been the exact connection between Persian art as represented by the sculptures, &c., at Persepolis and the Assyrian sculptures. There is no doubt a distinct but not a direct connection. The great bulls of the Propylæa of Xerxes and the lions and winged gryphons are evidently designed on direct inspiration of Assyrian work. The Assyrian palaces were in all probability in ruins in the time of Darius, and could hardly have furnished the sculptors with models. Also it is to be noticed that there are several marked deviations from the Assyrian design, as in the peculiarly disproportionate heads of the winged bulls and the very conventional forms of the lions in the friezes. The explanation is now, however, accessible. Just as the Vannic kings had borrowed their writing from Assyria, in like manner they borrowed their art. The antiquities discovered at Toprak Kaleh, bronze thrones, shields, &c., part of which are in the museums in London and Berlin, present the very peculiarities which are found still

more exaggerated in the work of the sculptors at Persepolis. Thus, then, the art of Armenia is the work which connects the art of the Achaemenian kings with that of Nineveh, and it will be seen that, after all, the ancient kingdom of Armenia, whose history was lost for centuries, played no mean part in the drama of empires some twenty-eight centuries ago. There can be little doubt that, like many other parts of Asiatic Turkey, it would be a rich field for archæological research could the Porte be induced to grant the necessary permission.

TESSERÆ.

Glass Cameo Cutting.

THE processes by which the Portland and Auldjo vases and many others were executed is exceedingly interesting, consisting as they did of a combination of the art of the gem-cutter with the artificial formation of the gem on which he worked. A lump of blue glass, for instance, having been taken on the end of the glass-blower's pipe was immersed in a molten mass of white glass, and the two gradually distended by blowing through the pipe, the twirling of the pipe and the touching of the partially-blown mass of glass at its end gradually shaping the vessel into its perfect vase-like form. Having been allowed to cool, the glass-maker's art had provided a vase in two thicknesses of differently-coloured materials, which, being exposed to the action of the glass-cutter's wheel, allowed of the removal of so much of the external white coating as left only a comparatively small portion of the white to show as a cameo upon the blue. A further series of operations analogous to those of the gem-cutter reduced the white silhouette to a perfectly-modelled bassissimo rilievo, this latter operation being precisely similar to the gem-cutter's usual dealing with a striated onyx or other similarly laminated mineral. It is curious to find an exactly similar process of glass-working and cutting in use from the earliest ages in the East, particularly in China, and the elaboration with which the Chinese occasionally worked, and still work, through three or four layers of differently-coloured glasses is quite extraordinary. In their practice, however, much more seems to have been left to chance than in the practice of the Greeks and Romans, since we usually find in old Chinese works of these kinds that the glass-worker has made up his vessel originally of pieces of differently-coloured glasses, sometimes overlying one another, and sometimes going completely through the whole thickness of the vessel. The ingenious Chinese glass-cutter took advantage of all these accidental thicknesses and crossings of differently-coloured materials to detach one from the other by extraordinary undercuttings, finishing the irregularly-shaped projections into any fantastic form which they suggested to his lively imagination.

Masonry and Freemasonry.

The first great event in the art of masonry was the building of the Tower of Babel; this expressed figuratively the attempt of some unknown mason to build up the temple of the Holy Ghost in anticipation of Christianity, which attempt however had been confounded by the vanity of the builders. The building of Solomon's Temple, the second great incident in the art, had an obvious meaning as a prefiguration of Christianity. Hiram, simply the architect of this temple to the real professors of the art of building, was to the English Rosicrucians a type of Christ; and the legend of masons, which represented this Hiram as having been murdered by his fellow-workmen, made the type still more striking. The two pillars also, Jachin and Boaz (strength and power), which are amongst the memorable singularities in Solomon's Temple, have also an occult meaning to the Freemasons which cannot be publicly explained. This symbolic interest to the English Rosicrucians in the attributes, incidents and legends of the art exercised by the literal masons of real life naturally brought the two orders into some connection with each other. They were thus enabled to realise to their eyes the symbols of their own allegories; and the same building which accommodated the guild of builders in their professional meetings offered a desirable means of secret assemblies to the early Freemasons. An apparatus of implements and utensils, such as were presented in the fabulous sepulchre of Father Rosycross, were here actually brought together. And accordingly it is upon record that the first formal and solemn lodge of Freemasons on occasion of which the very name of Freemasons was first publicly made known, was held in Masons' Hall, Masons' Alley, Basinghall Street, London, in the year 1646. Into this lodge it was that Ashmole the antiquary was admitted. Private meetings there may doubtless have been before; and one at Warrington (half-way between Liverpool and Manchester) is expressly mentioned in the life of Ashmole; but the name of a Freemasons' lodge, with all the insignia, attributes and circumstances of a lodge, first came forward in the page of history on the occasion just mentioned. It is perhaps in requital of

the services at that time rendered in the loan of their hall, &c., that the guild of Masons as a body, and where they are not individually objectionable, enjoy a precedence of all orders of men in the right to admission, and pay only half fees. Ashmole, as one of the earliest Freemasons, appears from his writings to have been a zealous Rosicrucian. Other members of the lodge were Thomas Wharton, a physician, George Wharton, Oughtred, the mathematician, Dr. Hewitt, Dr. Pearson, the divine, and William Lilly, the principal astrologer of the day. All the members, it must be observed, had annually assembled to hold a festival of astrologers before they were connected into a lodge bearing the title of Freemasons. This previous connection had no doubt paved the way for the latter.

Historic Painting.

The historic painter does not neglect or contravene nature, but follows her more closely up into her fantastic heights or hidden recesses. He demonstrates what she would be in conceivable circumstances and under implied conditions. He "gives to airy nothing a local habitation," not "a name." At his touch words start up into images, thoughts become things. He clothes a dream, a phantom, with form and colour, and the wholesome attributes of reality. His art is a second nature, not a different one. There are those, indeed, who think that not to copy nature is the rule for attaining perfection. Because they cannot paint the objects which they have seen, they fancy themselves qualified to paint the ideas which they have not seen. But it is possible to fail in this latter and more difficult style of imitation, as well as in the former humbler one. The detection, indeed, is not so easy, because the objects are not so nigh at hand to compare, and therefore there is more room both for false pretension and for self-deceit. They take an epic motto or subject, and think that the spirit is implied as a thing of course. They paint inferior portraits, maudlin lifeless faces, without ordinary expression or one look, feature, or particle of nature in them, and think that this is to rise to the truth of history. They vulgarise and degrade whatever is interesting or sacred to the mind, and think that they thus add to the dignity of their profession. They represent a face that looks as if no thought or feeling of any kind had ever passed through it, and would have you believe that this is the very sublime of expression, such as it would appear in heroes or demi-gods of old, when rapture or agony was raised to its height. They show you a landscape that looks as if the sun never shone upon it, and tell you that it is not modern—that so earth looked when Titan first kissed it with his rays. This is not the true ideal. It is not to fill the moulds of the imagination, but to deface and injure them; it is not to come up to, but to fall short of the poorest conception in the public mind. Such pictures should not be hung in the same room with that of "Blind Orion hungry for the morn."

Italian Enthusiasm for Art.

It is in the great monuments and permanent museums of Italy that we learn to recognise how inseparable the perfection arrived at in these minor arts was from that greater sublimity attained in the noblest efforts of the architect, the painter and the sculptor. It is precisely in this union of imagination of the loftiest kind with perfect technical dexterity in art productions, on either the vastest or the most minute scale, that the great strength of the excellence of the finest Italian design in old time consists. All these relics, whether taking the form of gigantic churches, of stately palaces, of heroic works of sculpture, of extensive frescoes, of elaborate furniture, of pottery, glass and even ornamental leather, show how absolutely indispensable to personal enjoyment art then was. Every student of the "Divina Commedia" must remember the almost passionate terms in which Dante mourns over that transition from simplicity of life and manners to a luxurious indulgence of the intellect and senses, which no sumptuary laws, however stringent, were ever able to subdue. Long and vainly the nobles strove during the fourteenth and fifteenth centuries to preserve for themselves a monopoly in splendour, but wealth accumulating in the hands of the citizens ultimately broke up their ineffectual blockade. How and with what results may be traced in the chronicles of Villani and Corio; in the excellent "Discorso di Guglielmo Manzi sopra gli spettacoli, le feste, ed il lusso degli Italiani nel secolo XIV.;" and in Muratori's grand collection of writers "rerum Italicarum." Out of the superabundant gains of the industry and commerce of Florence, Sienna, Genoa, Venice, Lucca, Pisa and Milan, and out of the accumulated riches drawn by an all-powerful priesthood from its spiritual tributaries in all parts of the world, one cannot fail to be struck with the very large proportion which was obviously expended in supplying this apparently insatiable craving for beauty. Sums of money which would frighten the nobles, commercial or hereditary, even of this kingdom, were lavishly expended on the great monuments of Italian art. Taking, for instance, such a city as Palermo, we find, even at the present day, not tens, but twenties and thirties of churches lined throughout with marble mosaic of the most costly description. The riches at

St. Mark's at Venice, St. Peter's at Rome, the Certosa at Pavia, St. Anthony at Padua and the churches of the Annunziata and San Matteo at Genoa, appear almost beyond estimation; while not only in monuments such as adorn these cities is the boldest dimension and the grandest scale adopted, but every inch of wall surface and every piece of church furniture, however insignificant, is made as elaborate as human ingenuity and human hands can make it. To such an exuberant extent was this apparent craving for enrichment indulged, that where, as happened in many cases, funds were wanting to complete the ambitious designs of the founder of some great monument, his successors, rather than leave the work altogether unfinished, have endeavoured to realise by paint and every kind of ingenious expedient the effect so ardently desired by the original founder of the edifice. Hence proceed many of those illusive perspectives which almost convert flat ceilings into airy cupolas, and carry out the eye of the visitor in the *salone* or grand apartment of the *piano nobile*, or principal floor of an Italian residence, through apparently interminable arcades to an exuberant landscape alive with statues and fountains.

The Royal Exchange.

The general impression is one of ornamental heaviness, with a display of wealth certainly, but which had not been fortunate in securing the guidance of good taste. The best appearance is undoubtedly that presented towards Cheapside, whence the tower and cupola combine agreeably with the portico; but the latter is out of keeping with the rococo style of dress that prevails in other parts. The fenestration in particular is open to much question. The circles inscribed within other circles that are not concentric to them, as in the east front, engender an unpleasing mixture of plane and spherical trigonometry, very perplexing to those who have only time for the monetary calculations applicable to the *locus in quo*. Then again in the interior court the windows of the upper floor fatigue one with corresponding want of symmetrical arrangement. There is first a great semicircle coving round a smaller one, within which a triangular pediment is awkwardly introduced; below that a square, then again another semicircular head inscribed in this square, whose spandrels thus abridge the light which would have been welcome to the chambers within. In the court below the engaged Tuscan columns supporting an entablature no wider than their own capitals, which merely starts out from among the *voussoirs* of the arches of the colonnade, have a singularly ungracious and anomalous aspect. The columns, in fact, both within and without are an additional instance of the difficulties that unavoidably attend their introduction into the buildings such as our times and usages require. If they are dipteral our rooms must be lit in some other way than they usually are; if they are engaged, *i.e.* merely decorated piers on the face of the wall, we then see two or more rows of windows squeezed in between them, and close underneath a cornice to which they are necessarily so near that it becomes uncomfortably oppressive. This is the case at Cornhill, in proceeding along which the eye is caught by the protruding window-sills and dressings, just disturbing the vertical cylindrical lines of the columns.

Opie and Northcote.

When Opie was engaged on his picture of the death of James I. of Scotland, Northcote, who was his imitator and rival, became alarmed at the reports which reached him of its extraordinary merit. The uneasiness produced by his jealous fears drove him to pay a visit to the studio of Opie, that he might judge for himself. "When I entered the room," he says, "I was astounded. The picture had the finest effect I ever witnessed; the light on the figures gleamed up from below a trap door by which the murderers were entering the King's chamber. 'Oh,' I said to myself, 'go home, go home; it is all over with you.' I did go home, and brooded over what I had seen. I could think of nothing else; it perfectly haunted me. I could not work on my own pictures for thinking of the effect of his. At last, unable to bear it any longer, I determined to go there again; and when I entered the room I saw, to my great comfort, that Opie had rubbed all the fine effect out."

The City and Foreigners.

We read in the "Acta Regia," "The Italian merchants and owners procured that part of the City of London on the north side out of Tower Street, called Minchin Lane, to build upon for their lodgings and storehouses, as the merchants of the Haunce of Almaine were licensed to have an house called Guilda Teutonorum, the Guildhall of the Germans; the merchants of Bordeaux were licensed to build in the Vintry strongly with stone, as yet may be seen, and seemeth old though often repaired. A spot near Mincing Lane was the manor of Blanch Apleton, where, in the 3rd of Edward IV., all basket-makers, wire-drawers, and other foreigners were permitted to have shops. Blanch Apleton is corruptly called Blind Chapel Court; it was a manor belonging to Sir Thos. Roos, standing at the north-east corner of Mart Lane, so called from the privilege of keeping a mart there, but now called Mark Lane."

NOTES AND COMMENTS

WE lately referred to the litigation which arose in connection with a boundary-wall forming part of the premises of the Sun Assurance Company in Glasgow, of which we published an illustration last week. The owners of the adjoining ground proposed to use the wall as a party-wall and to erect on it a building 51 feet in height. As opposition was raised the case was tried in the Sheriff Court and judgment was given in favour of the Sun Assurance Company on the ground that there was no such absolute right to the use of the wall as was claimed. The other parties appealed and the case came before four of the judges in Edinburgh, when it was declared that the boundary-wall was a mutual gable-wall. The case was ordered to be sent back again to the Dean of Guild Court in order to have it determined whether the plans of the proposed building can now obtain approval. There would be much advantage if the case could be brought to the House of Lords, for if the judgment of the Edinburgh Court is not overruled it will have an effect on building in Scotland which will not be altogether advantageous.

AN appeal has appeared from Sir GEORGE BIRDWOOD soliciting relics and memorials of the East India Company for exhibition in May at Earl's Court. The classes desired are:—1. Portraits, which will chiefly be engravings, of notable members of the company, or of servants of the company and other persons who distinguished themselves in the company's service. 2. Paintings, drawings, sketches, or engravings of buildings or scenes connected with the company's history; or of memorable events or actions or episodes connected with the same; or illustrating life in India under the company's rule, particularly its romantic side. 3. Original maps and plans of battles and manuscripts, particularly letters of special interest relating to India, by distinguished Anglo-Indians. 4. Seals, and impressions of seals, when these are distinct, and naval and military flags and colours, and stamps and impressions of the company's "bale mark." 5. Medals given by the company and coins issued by them prior to 1858. 6. Naval and military uniforms of the company, and arms, particularly those bearing the company's "arms" or their "bale mark;" the silver badges of their boatmen and the truncheons of their constables. 7. Swords of honour and presentation plate. 8. Furniture and marble bas-reliefs and statuary, from the old East India House, removed from it in cartloads to "the four imagined corners of the world." The East India Company was formed in 1599 with a capital of about 30,000*l.*, and the first charter was granted in the following year.

HIS meritorious services to the State in connection with the National Portrait Gallery earned a knighthood for the secretary, keeper and director. Sir GEORGE SCHARF deserved honour on other accounts. In his prime he was one of the few artists who could produce satisfactory figures in outline, and hence his drawings of antique statues are always satisfactory. He was no less competent to suggest the character of paintings, as will be seen by his illustrations of KUGLER'S "Handbook." In the woodcuts of such books as Dean MILMAN'S "Horace" and MACAULAY'S "Lays of Ancient Rome" his refined and accurate drawing is at its best. His superiority to ordinary draughtsmen will be apparent to all who compare his work with G. F. SARGEANT'S in Bishop WORDSWORTH'S "Greece." Sir GEORGE SCHARF was born in London in 1820, and educated at University College School. After gaining medals at the Society of Arts, he was admitted a student of the Royal Academy in 1838. His first published work was a series of etchings entitled "Scenic Effects," illustrating MACREADY'S revivals at Covent Garden Theatre. He travelled through Italy and various parts of Asia Minor in 1840-43, as draughtsman to a Government expedition. Many of his drawings are now in the British Museum. He was art secretary to the Manchester Exhibition of 1857, and in the same year was appointed Secretary and Keeper of the National Portrait Gallery. Among his writings are a "History of the Characteristics of Greek Art," prefixed to WORDSWORTH'S "Greece;" Descriptions of the Greek, Roman and Pompeian Courts at the Crystal Palace,

"Artistic and Descriptive Notes on Remarkable Pictures in the British Institution Exhibition of Ancient Masters" (1858), "Catalogue of Pictures and Works of Art in Blenheim Palace," "Catalogue Raisonné of the Pictures belonging to the Society of Antiquaries, London," "Catalogue of Pictures at Krowsley," "On a Votive Painting of St. George and the Dragon," &c. He is likewise the author of an historical account of the pictures belonging to the Crown, tracing their vicissitudes from the reign of HENRY VIII. to the present century. In 1882, after a service of twenty-five years, Sir GEORGE SCHARF was constituted Director of the National Portrait Gallery.

CORPORATIONS cannot expect to be able to erect large buildings of an experimental kind and be free from claims for extras unless in the contracts they have allowed contractors ample sums to provide for all the contingencies which can be imagined. The new labourers' dwellings in Manchester do not correspond with the Waterlow or Peabody buildings in London, and there were no precedents for some of the arrangements. The builders claim 7,383*l.* on the Oldham Road blocks, and 5,535*l.* on those in Pollard Street. The sums are large, but it may be they were unavoidable. The sanitary committee of the City Council having charge of the work stipulated that no extras should be ordered without their written consent. It may, therefore, be assumed that the stipulation was observed. The explanation of the architects has to be given, and until it is considered the responsibility cannot be assigned, but if there were irregularities, the Council will not readily condone them.

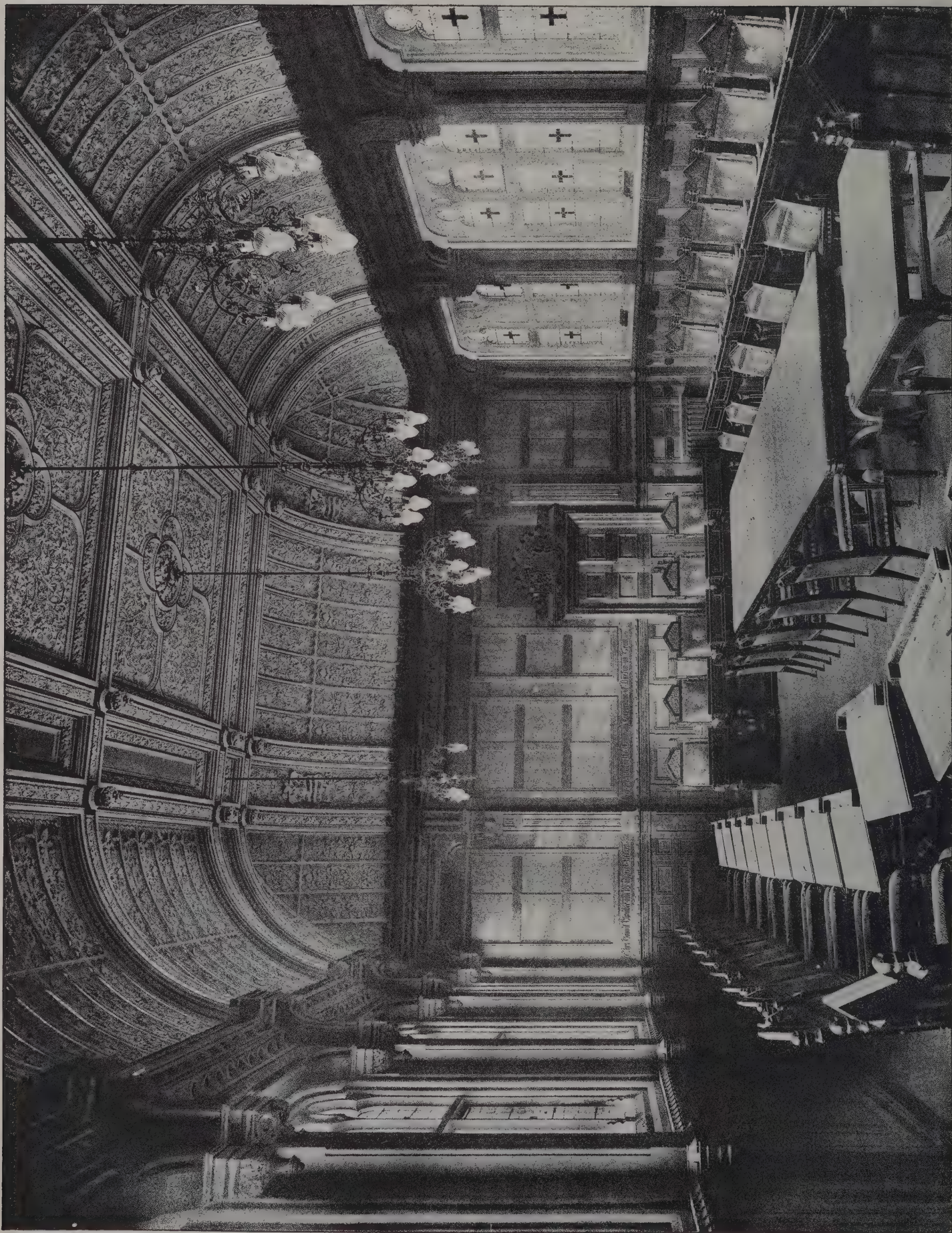
ON Monday Mr. SILVANUS TREVAIL, architect, mayor of Truro, was presented, through the Lord-Lieutenant of the county, with a testimonial, for which subscriptions were obtained from all parts of Cornwall. It consisted of a dinner, tea, coffee and dessert service, a seven-light candelabra and other articles, mostly silver, and a cheque for 100 guineas. The salver bore an inscription beneath the Mayor's crest and the county and borough arms, stating that the testimonial was presented in grateful recognition of the valuable services rendered by Mr. TREVAIL to the county during the parliamentary session 1893, in the railway development of Cornwall. Mr. TREVAIL, in returning thanks, said he was exceedingly proud of the recognition of his services to the county which had fallen from the Lord-Lieutenant. That railway business had to be done publicly, and he could not help his personality being prominent in it. But he had worked harder for other things. He worked harder for a harbour of refuge on the north coast, and he remembered going with a deputation, headed by the Lord-Lieutenant, to Mr. CHAMBERLAIN, when that gentleman was President of the Board of Trade. Mr. CHAMBERLAIN, he thought, received them coldly, and in a nonchalant manner seemed to say, "I am President of the Board of Trade; I shall do what I like in the matter. Good-bye." But during the last week had we not cause to wish that something could be done to provide a harbour of refuge on the north coast? There was another way in which they could save more lives than even by a harbour of refuge, and that was by improving the sanitary conditions of the county. It was only by careful study that one could get an adequate conception of the loss of life through insanitary conditions. Although Cornwall already had one of the lowest death-rates, it might still be reduced by two or three per 1,000, and that, on a population of 300,000, meant saving 600 or 700 lives a year. Moreover, if they could prove that their peninsula was the healthiest part of the British Isles, with the most favourable and most equable climate, they would get such a residential population there as would compensate them for their losses in mining, agriculture and fishing, and that would be a permanent interest which detracted nothing from the county like mining. The county had splendid coast scenery, second to none, and having these natural advantages why should they not take every opportunity of showing them to the rest of England and inducing people to come to them? This was a work not only for themselves, but for the future benefit and prosperity of the county. When they saw mine after mine closing they must get some new interest to take the place of mining.



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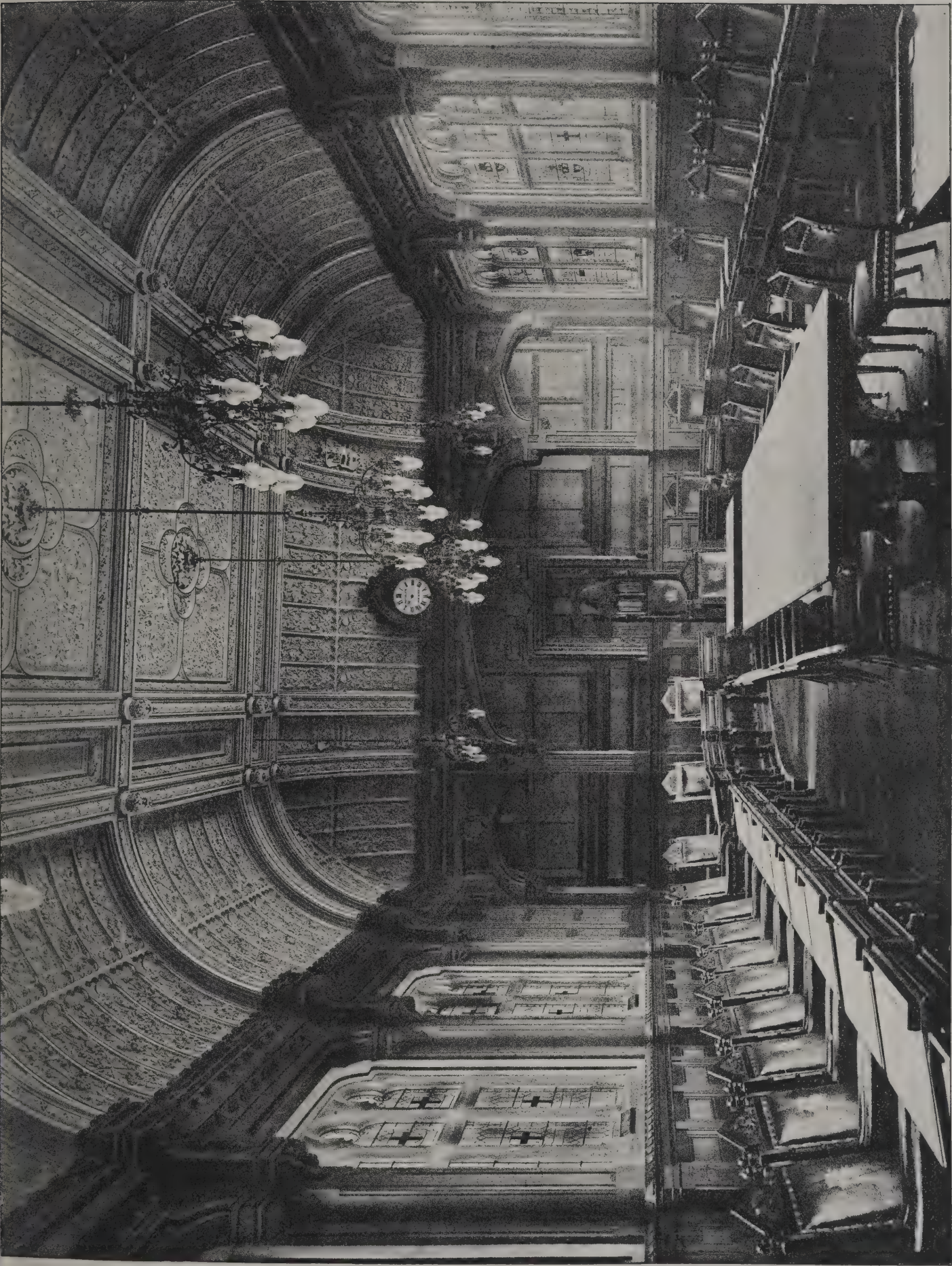
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INK-PHOTO, SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

COUNCIL CHAMBER, NEW TOWN HALL, BURTON-ON-TRENT.

REGINALD CHURCHILL, Architect.



INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

COUNCIL CHAMBER, NEW TOWN HALL, BURTON-ON-TRENT.
THE GIFT OF LORD BURTON.
REGINALD CHURCHILL, Architect.



8th 1895.



INK PHOTO SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

BURTON-ON-TRENT.
MR. BURTON.
C. L. Architect

ILLUSTRATIONS.

COUNCIL CHAMBER, NEW TOWN HALL, BURTON-ON-TRENT.
NEW TOWN HALL, BURTON-ON-TRENT.

A FEW years ago we published a view of the St. Paul's Institute in Burton-on-Trent, which was erected at the cost of the late Mr. M. T. BASS, from the designs of Mr. REGINALD CHURCHILL, the cost being 46,000*l*. In 1891 Lord BURTON, interpreting the wishes of his late father, offered the buildings as a town hall, and in addition proposed to add a suitable council chamber which would cost about 17,000*l*. Expenditure on other works was also needed, and the group of buildings may be valued at 85,000*l*. If the other buildings presented to the town by the late Mr. M. T. BASS and Lord BURTON be included, the gifts represent an outlay of 172,000*l*. The new wing, which contains the council chamber, has been carried out in Late Decorated style throughout, and is built with best red facing bricks from Messrs. J. KING & Co., of Stourbridge, and with Ancaster stone dressings on the exterior, the whole of the interior—corridors and staircases—being faced with Corsehill and Mansfield Woodhouse stones. The Corsehill is used for dados, cornice, door and window-joints and arches, and the Mansfield for ashlar-work generally. The combination of these two stones has worked out most effectively and satisfactorily. The general arrangement of the reception-rooms and offices is as follows:—The mayor's entrance under the tower gives access to a spacious hall with porch, separated by glass screen doors with the town arms thereon in brilliant cut glass. A porter's lodge is provided here and a small waiting place. These are enclosed by an arcading of three arches, supported on massive polished red granite bases and shafts. The town surveyor's private office and two of his drawing offices open out into the hall, and a connection with the public or town hall is also provided. The grand staircase provides communication with the council offices on the first floor. The whole of the staircase has been faced with Mansfield Woodhouse stone about three-quarters of an inch in thickness, doweled in every course with copper holdfasts to the old wall, and finished with a deep frieze of tracery and a carved cornice in Corsehill stone. All the old timber-work of the doorways has been pulled out, and enriched joints and pediments out of Corsehill stone substituted. New archways have been cut, other openings closed up and practically a new building, so far as the interior is concerned, has been constructed. Two cloak-room lavatories, tiled throughout on the walls by Messrs. MINTON, HOLLINS & Co., of Stoke, have been provided off the staircase and fitted up in the best style with oak screens, Devonshire marble ranges and TWYFORD'S best basins and other apparatus. Two committee-rooms are provided on the upper floor, together with the mayor's parlour, finished in wainscot oak, and his worship's retiring-room. The town clerk's office is in close contiguity to the council chamber and is a large and well-lighted room, from which access is obtained at the north end to another corridor, with separate staircases to the lower floor and to the public entrance from the street. In this corridor are arranged three offices for the town clerk's staff, strong-room, stores, lavatory and office for the medical officer. Two spare offices are provided on the second floor.

On the ground floor of the new wing, which has a separate entrance from the street, are the public rates office, borough collector's office and additional accommodation for the borough surveyor's drawing staff, together with offices for the sanitary inspector and borough inspectors, and for the borough accountant and his staff. A house for the caretaker, with parlour, living-room, scullery and five bedrooms is also incorporated with the block of offices. Spacious cellars, vaults for heating and the electric transformers, coals, &c., are provided in the basement.

The council chamber, 53 feet by 30 feet and 21 feet in height, is panelled in oak throughout from floor to ceiling, fumed and wax polished, and the whole of this work has been executed by Mr. J. THOMPSON, of Peterborough. It is divided into five bays at the sides and three at the ends. Nine of the side bays are filled with three-light windows, enriched with stained-glass, and contain shields charged with the armorial bearings of the mayors who have passed the chair since the charter of incorporation, and continued

by other shields charged with St. George's cross, to be removed and filled as other mayors succeed to civic responsibilities. The east end of the room is divided from the main part by three arches, and is apportioned to the public who wish to attend the debates of the council, a separate access thereto with stone staircase being provided. The whole of the oak-work is elaborately finished and carved, and an inscription notifying the fact of Lord BURTON'S gift to the town is introduced at the west end.

MESSRS. HARDMAN & POWELL, of Birmingham, are responsible for all the polished bronze fittings and furniture, and Messrs. HOMAN & RODGERS, of Manchester, for the polished oak-block floor, as well as for all the fireproof floors throughout this building.

The oak furniture for this room is also provided by Lord BURTON.

The town hall portion of the premises has not been considerably altered from its original state as St. Paul's Institute. Thorough renovation has been carried out, and new oak panelled and traceried porches have been erected at the main entrance. This room—80 feet by 40 feet—contains a fine organ by KIRKLAND and a permanent orchestra. There are also seven anterooms attached, large kitchen, scullery, larder, wine-room, &c., and every convenience in the shape of glass, earthenware, linen, electro-plate, &c., to dine 300 persons. Attached to this portion of the building is the annexe or reception-room—63 feet by 23 feet 6 inches—which can also be used for suppers at balls or other large functions. The whole of the works have been carried out by Messrs. THOMAS LOWE & SONS under the architect's personal superintendence, with Mr. S. NEEDHAM as clerk of works.

Among the contractors are Messrs. NICHOLLS & CLARKE, of Shoreditch, leaded lights and other glass-work; CHAMBERLAIN, KING & JONES, furniture; MILNER & Co., safes; GEORGE PRICE, LIMITED, strong-room doors; T. RODDIS, carving; and BEESTON FOUNDRY Co., Nottingham, radiators.

ENTRANCE HALL, THURLAND CASTLE, KIRKBY LONSDALE.

THE ARCHITECTURAL ASSOCIATION.

THE ordinary meeting of the Association took place on Friday evening, the president, Mr. E. W. Mountford, in the chair.

Mr. T. W. Aldwinckle, jun., was elected a member.

Mr. W. SAMUEL WEATHERLEY read a paper on

Architectural Perspective.

Mr. Weatherley said:—The making of an architectural perspective mostly presupposes the drawing of that which does not yet exist, and one may add parenthetically, never may exist. Thus it is that the perspective has to be worked from geometrical drawings from plans, elevations and sections, and I expect I have been asked to try to tell you to-night what I can about the methods I have used, the practical rather than the theoretical side of the question—at least, this is the interpretation I have put upon the invitation of your committee. I do not think I need apologise for doing so when we consider that the scientific side has so often to admit the absurdity of its results; in fact I very much doubt whether perspective can, strictly speaking, be brought down to rules, certainly not hard and fast ones, for there is scarcely a rule but has to be broken, and therefore the best course it seems to me to be thoroughly grounded in a few broad principles which must be used with a large proportion of that useful article known as common sense. The very first day of my pupillage I was set to work upon perspective, and this without any previous knowledge from books, and a very fortunate circumstance I have always considered it. I doubt much whether anybody ever learnt from books alone anything of practical use; those I have met who have tried have certainly failed. Two books I have lately looked through, one "Modern Perspective," by Mr. W. R. Ware, published at Boston, U.S.A., in 1883; the other, a more recent publication, I believe the very latest and in the library of the Institute, to which I shall presently refer. The first book is a scientific and practical work written in precise and clear language. I am bound to say it interested me greatly, for Mr. Ware was an old member of the Spring Gardens Sketch Book. It almost seems as if some of the dodges in use when I was with Sir Gilbert Scott might have originated from

him. For instance, what he calls in his book the "method of diagonals" and the "method of triangles."

It may help you to understand my subsequent remarks if I just run through the terms used, more or less customary no doubt, when working from a plan.

1. *Point of Station*.—The point where the spectator stands, i.e. the eye of the spectator.

2. *Visual Rays*.—Rays from the point of station.

3. *Centre Visual Ray*.—A line from the point of station bisecting the angle formed by the two extreme "visual rays," forming, in fact, the centre line or focus of the perspective view.

4. *Point of Sight*.—The point where the "central visual ray" first cuts the building.

5. *Picture Plane*.—A line or vertical plane at right angles to the central visual ray (used with reference to the plan).

6. *Vanishing Points*.—Points at which all lines that are in reality parallel must vanish.

As a rule vanishing points are on the horizontal line.

In what is called parallel perspective, where one side of the building is parallel to the picture plane, and therefore has no vanishing point, the vanishing points for the other sides will be found to coincide with the point of sight.

7. *Horizontal Line*.—This is always the level of the eye (used with reference to the perspective).

8. *Height Lines*.—Lines erected vertically on the horizontal line for the purpose of measuring off the heights to the same scale as the plan.

I think I can best illustrate these if I take the "point of station," "visual rays," and the "picture plane," and apply them. For a beginner it is by far the better way, in my opinion, to determine the "point of station" on the spot, and to do this you must select a building which exists, and of which you must also have the geometrical drawings. There will be some important feature you wish to emphasise in your view; see that this groups with the other features, and whether improved by standing rather close in or further away; then notice where your eye appears to rest, looking full to the front, the central visual ray forming as it were the focus of your view, and then imagine between yourself and the building a sheet or plane of glass—the picture plane—upon which you might trace the view at once, every line vanishing to its proper vanishing point. The distance between yourself, that is, the "point of station," and the sheet of glass is a movable feast, and only affects the size your tracing would be. I am aware the picture plane is an artificial invention, for no doubt we view things as seen upon a surrounding transparent sphere, as if we stood in the middle of a gigantic soap-bubble. When you have these things determined and fixed in your mind, transfer them to your plan to the same scale as your plan, and you will have learnt some vital requirements which give you successful command for all that follows. If the building does not exist, or you cannot get to it, you must go through the same operation in imagination, using the plan and other drawings, bearing in mind that from the "point of station," as far as the building is concerned, the eye can only take in an angle of about 60 deg., that is, 30 deg. either side the central visual ray, and this applies also to vertical heights with certain modifications, such as the upper part of spires, which may somewhat exceed this angle. We know, therefore, pretty much how near we may stand in, and how far off we stand is governed somewhat by the nature of the building, whether picturesque or severe in character; standing too near brings about an acute result, too far a tame result. As a rough general rule, the distance from the nearest angle of the building is found to be about one and a half to twice the width comprised between the two visual rays that cut the extreme points of the building on the "picture plane," but there is no golden rule; it is a matter of judgment which experience alone can teach, and it can most easily be acquired by working back from an existing building, and for a beginner it enables him to identify and realise what the "point of station," "central visual ray," and "picture plane" really are when drawn on the plan.

To exemplify this, and to show how easily everything else follows—vanishing points, horizontal line, height lines, &c.—I will take a simple case, such a building, for instance, as the Cloth Hall at Ypres, in Flanders, a building with façade some 460 feet long, flanked by two corner turrets, and with a central tower 230 feet high. Suppose we stand about 650 feet away, determining the position and distance for the reasons already stated. From the "point of station" draw lines on rays to the extreme points of the building, bisect this angle, the bisecting line being the "central visual ray," and then draw the "picture plane" at right angles to it, and if drawn as shown on the diagram, the point where it cuts the building will be the same scale as the plan from which you are working, necessarily so for all vertical heights at this point, and hence a height line.

Of course the "picture plane" could be either nearer or further away from the "point of station," according to the size the drawing is intended to be. Objects lying at the same distance as the "picture plane" are of the same scale as the plan; objects behind have their perspectives smaller, being conically

projected forward upon it; and objects in front have their perspectives larger, being conically projected backward upon it. The "picture plane" is the line upon which all perspective widths and depths are measured; the measurements being taken from just where the lines or rays drawn from the "point of station" or the eye to any point of the building cut the "picture plane." Whether the "picture plane" is behind the plan of the building, and the rays have to be extended—conically projected backward upon it—is immaterial, and I may remark in passing that I have found it convenient to draw the rays without reference to any points on the plan, except perhaps a few salient ones, drawing them pretty closely together, if in ink or pencil then occasionally a red one among them, and by doing so you will find the eye will readily follow any point on the plan, either up or down to the "picture plane," and then can be measured off with more accuracy than if the rays had been drawn to each particular point; and the rays need not be drawn further than you like on the "point of station" side of the "picture plane," nor beyond the limits of the plan on the other side, unless additions are likely to be made to the plan in the fore or back-ground; the object being to get all your leading lines from the plan on to the "picture plane," and thus have done with the "point of station," and you will be very glad to do so, as it is mostly a long way off the paper, and very probably the drawing-board. The next thing to do is to find the vanishing points, and this is simply mechanical, because, having arrived so far, they give themselves thus—draw a line from the "point of station" parallel to the side of the building for which you want the vanishing point, until it cuts the "picture plane," and where it cuts it will be the vanishing point required, and it can be measured off, say, from the "central visual ray," and transferred to the "horizontal line;" and, if you remember that all lines in reality parallel must vanish to the same vanishing point, it will clear up any confusion that might at first arise, for you have only to repeat this operation for any side of your building at whatever angle it may be. "Height lines" can be erected on the "horizontal line" at any point where the building cuts the "picture plane." If the "height line" is wanted at a part where the building is beyond the "picture plane" or on the "point of station" side of it, all you have to do is to produce upon your plan any side or face of the building in the same straight line until it cuts the "picture plane," and at the point where it cuts set up your "height line," and measure your heights upon it to the same scale as your plan, working back your heights to the vanishing point for that side of your building just produced until they cut the desired parts. It was while struggling with the difficulties of an exterior and uncertain as to "height lines," that a fellow pupil turned round on his stool, and holding up about three-quarters of the length of his pencil, asked pathetically whether that was a fair height for the spire.

You will find in practice that it is best to make a height line do as much work as possible, and not employ too many; you will soon find out what is best to be done as the cases arise. The rules which I have run through and explained by the diagrams are sufficient to enable you to make an architectural perspective, but their extended application is more intricate, and herein lies the resource and skill of the draughtsman. Before attempting to describe any of these refinements, I will just refer to the second of the two books on perspective I looked through, the one recently published. If you come across it you will know it, because in every diagram the "picture plane" is drawn in no case at right angles to the "central visual ray," the necessity for which cannot be too strongly impressed otherwise the perspective will be distorted. I remember the street front of an otherwise fine drawing, outlined for Mr. Brewer to colour, having the appearance of looking round at one. I believe in this case the temptation was to show deeply-recessed arches, and at the same time convey the effect of great length to the façade. Another singularity in the book is that the "picture plane" is always drawn as touching the angle of the building nearest to the "point of station," and this is taken as the height line for all the vertical heights. Neither of these cases is wrong, but the former restricts the size of the view and fails to impart very necessary information, and the latter in practice would not simplify but lead to inaccuracy. No warning is given about an angle of 60 deg. or any other angle being all that can be included, nor a hint of how to avoid the extremities of a building becoming distorted. I think I need not mention the author's name, for you will not require to seek his book, and I have told you how to know it should it happen to fall in your way. I have been showing how to find the vanishing points, and for those that come upon the paper or drawing-board upon which you are making your perspective you cannot do anything better or have them more conveniently to your use; but for those that come a long way off and are outside the drawing-board it is not worth while to find them at all. The vanishing points are of no value; it is the angle at which the lines vanish that is wanted, and this can be found in several ways, thus:—

Divide the distance on your plan between the "point of

station" and the "picture plane" along the "central visual ray" into, say, five equal parts, and from the fourth part counting from the "point of station," produce a line parallel to the side of the building for which you require the vanishing angle until it cuts the "picture plane." Erect a vertical line A at this point, and also a vertical line B where the "central visual ray" cuts the "picture plane"—both lines the same, but of any convenient height. Divide the line B, which is the "central visual ray," erected vertically, into five equal parts, being the same number as you have already divided the distance between the "point of station" and the "picture plane," and from the top of the fourth division draw a line parallel to the "horizontal line," cutting the line A. If a line be then drawn from the point at the top of the fifth division on the line B to the point where the line parallel to the "horizontal line" cuts the line A, it will form with the "horizontal line" the perspective angle required. If I complete the process through the five divisions you will see that each of the right-angled triangles is, as far as their sides are concerned, one-fifth the length of the total angle. Or you may divide both vertical lines A and B into five equal parts, and, having done so, draw a line from the top of the fifth division on the line B until it cuts the line A at the top of the fourth division, and the same result will be obtained. This line, if produced, cuts the "horizontal line" at the "vanishing point" for the side of the building with which we are dealing. A centrolinead can be set to the above perspective angle—that is if you use one, I have not for very many years—or you can run the line to the edges of your paper, and form a scale on both sides; then the left or right hand one or both can be some definite scale upon which heights may be measured off.

Another way of getting at the angle for the far-vanishing point, commonly practised at Scott's, was to erect two vertical height lines on the "horizontal line," one A being, say, where the "picture plane" cuts the side of the building, having the far-vanishing point, and the other B where a line produced at right angles to the same side from any point some way down the side cuts the "picture plane." Then we should set up equal heights on both, and run the far one B down towards the near vanishing point, which you must have already found and marked on the "horizontal line" until it cuts a vertical line C, erected over the point on the "picture plane," where the "visual ray," from the "point of station," cuts it on its way to the point from whence the line which gave the point B was produced. Having done this, draw a line from the top of the height line A to the point where the height line B cuts the vertical line C, and you will have the perspective angle given you. A very foolish way, but gravely undertaken in my pupilage days, was to produce the "picture plane" and a line from the "point of station" parallel to the side of the building having the far-vanishing point until they met; not infrequently through a doorway from one office to another, and for this purpose we kept a huge ball of string. Then the angle was taken, the centrolinead set and the view begun. I recollect during my pupilage making a perspective for a competition of the exterior of a building in Mark Lane. We fixed the "point of station" some 300 feet away, on the other side of the Lane, and the vanishing point for the front was found by the means I have just described. There are the useful, in fact, indispensable, 45 deg. vanishing points. These are found in precisely the same way, that is, a line parallel to the 45 deg. side and drawn from the "point of station" until it cuts the "picture plane," and then transferred to the "horizontal line." The far one can be got from one of the divisions on the "central visual ray" on the principle used for the far vanishing point of the building. For diagonals of towers, for the setting out of pavements, divisions of bays, and for the sides of octagons, &c., these points are, as I have said, indispensable. When a 45 deg. vanishing point comes very near the "central visual ray," it is not of so much use for objects near the centre of the composition, because the angle it makes with the vertical lines is so acute. Vanishing points for an angle of 60 deg. are obtained in the same way, and are, of course, required for hexagonal forms. Up to the present I have been chiefly referring to exterior views, but the methods hold good in the main for interiors, bird's-eye views and what Mr. Ware alludes to as toad's-eye views. Interiors are frequently drawn in what is called parallel perspective, in which, if a parallelogram, then one side of the building is parallel to the "picture plane," and therefore without a vanishing point, and the vanishing points for the other sides coincide with the "point of sight." It is a mistake to let the "point of sight" be exactly in the centre, but it cannot be very much out of the centre if the view is to be kept in parallel perspective. Mr. H. W. Brewer's very fine interiors are mostly drawn in this way. Personally, I prefer using angular perspective or a judicious blend, for instance, in the near parts where the horizontal lines are obviously getting out of perspective, such as to the beams of a roof or to the pavement. Interiors require management; you may have, for example, the abacus of the capitals on the flanking sides, as they get near you, looking as if they skewed upwards and outwards, although

in reality drawn perfectly horizontally. Or, again, you may have, at the far end, an arcade opposite you in which the columns, as taken from the "picture plane," get wider the further they extend to the right or to the left. I need scarcely say these sort of things have to be corrected to what will satisfy the eye, which you must not forget an outsider possesses and uses with critical effect. Interiors admit of some considerable scope in the latitude and flexibility of perspective rules. Really a very beautiful drawing made to show the octagonal central hall of Sir Gilbert Scott's design for the Royal Courts of Justice is probably unique in this direction, in that it shows seven sides of the octagon. The perspective is reduced and forms the frontispiece to the second volume of Sir Gilbert Scott's "Royal Academy Lectures." Bird's-eye views have the "horizontal line" high up, fixed according to the range of view required; they are troublesome drawings to make, and the vertical heights have a tendency to look too high. The best advice I can give you is to place yourself a long way off and a good way up. Toad's-eye views, to quote Mr. Ware again, are luxuries, except in a mild form; they are, as their name implies, the converse of a bird's-eye view; the mild form is when a building is on rising ground some 30 feet or so above the eye.

I remember going in for the Preston Hotel competition, the site being some 40 feet above the surrounding grounds, which I well knew rose rather swiftly to the plateau for the hotel. I roughed out a view, putting the building 40 feet above the horizontal line, deducting nothing for the level of the eye, and the result was as if I had placed it on a mere hillock, and before I got the appearance I knew it ought to have I had to add another 25 feet. Everyone who has gone through some such experience must be quite aware of the result. What may be the explanation I hardly know, but it is, I think, one of the many illustrations of the attempt to reduce an art to abstract rules which have been pushed too far. As a matter of fact, when we look at a building on a hill we do not keep our eyes fixed into the hill side 5 feet more or less above the ground we happen to be standing upon. This is, however, what the rules of perspective compel us to do. In looking at a building on a hill the "central visual ray" is really thrown up, the "picture-plane" to be at right angles is tilted forward, and as a consequence the vertical lines vanish upwards. Anyone who has stood close under a hill and sketched some tallish building on the summit cannot fail to have drawn the vertical lines converging upwards. There is something very odd about mountains and hills, for if you made a model to scale, for instance, of the Snowdon range, you would find the mountains looked mere absurdities, and it is partly for this reason that engineers and surveyors adopt two scales, the larger one being used for the heights.

During my pupilage I was lent out to Messrs. Bodley & Garner, and from them learnt to work perspectives with two scales, one scale having a twelfth added and used for all vertical heights. For interiors you will find this gives a much juster representation, which you can prove for yourselves from an existing building. The use of diagonals is one of the simplest and most accurate ways of finding centres or dividing up spaces either in odd or even parts; in fact, they can be employed in ways without end. Here are a few applications:—It is evident the diagonals of the squares, or, in other words, the 45 deg. vanishing points, can be used in working out interior views in parallel perspective, so that you may practically dispense with the plan. For instance, you can make a scale across any of the horizontal lines; suppose the total width be 25 feet, and your bays are 15 feet, all you would have to do would be to divide the width into twenty-five parts, take fifteen of them, and by means of the 45 deg. vanishing points, mark this off on the perspective side, and then you have the 15 feet bay in its perspective length. This principle admits of unlimited extension, so that for widths and depths it is quite unnecessary consult the plan other than to know the actual dimensions. This method is, I believe, largely taught among drawing-masters, and adopted by painters and others who will not or cannot understand a plan. I do not think an architect would take kindly to it, and it is useless with angular perspective and for exteriors. Mr. Ware describes a method of triangles which he considers a more direct application of the same principle. It is undoubtedly more direct, and it can be used with advantage when the vanishing point of the third side of the triangle comes conveniently on the drawing-board, otherwise it is a bother, and the ordinary use of diagonals is practically less trouble. Diagonals are also absolutely necessary for putting in circles, either vertically or horizontally, or arches in perspective. You will find the curve on the far side of the arches can for all practical purposes be struck on a line parallel with the "horizontal line," that is, at right angles to a vertical line from the perspective springing. The near side is always a compound curve in drawing; it can be drawn by the hand, struck in by compasses or by means of curves. Remember that both sides of the arch are parts of an ellipse. I am, of course, now speaking of arches composed of segments of circles. Remem-

bering this helps the draughtsman to give the right swing, and to know instinctively how the curves in perspective ought to look, especially for the near side, which is the difficult one.

With respect to circles in perspective, there are two aspects which do not require extraordinary skill to depict, that is when it happens to come a circle pure and simple, or a straight line, every other aspect is an ellipse, but this is cold comfort, for it is almost more trouble to draw an ellipse, irrespective of the difficulty of finding the perspective angle of the major and minor axes; still, it is useful to know how to draw an ellipse, because it helps, as I said before, to give you the right swing.

To Draw an Ellipse.—Let B C be the major axis and D E the minor, bisecting one another at A. From D or E, with the radius A B or A C, strike the circle F G, G F cutting the major axis at F and G (these are the foci). From G strike a circle with any radius less than A C, say G H; then measure off this radius on line C B, from C, at K, as shown. From the centre F, with radius equal to B K, strike a circle, cutting the other circle at H. Find any number of points such as H. F H and H G are together equal to C B.

A sphere, if drawn according to the rules of perspective, becomes an ellipse, whereas spheres under all conditions are as round as a ball.

To work out the "point of station," scale and plan of a building from a photograph or perspective is sometimes of great service. The following is the method I use:—Find three vanishing points, one being a 45 deg. vanishing point or any known angle vanishing point.

Let A B and C be the three vanishing points, B being a 45 deg. vanishing point. Bisect A C at D, and describe the circle A E C. Make angle A D E equal 90 deg or twice angle of 45 deg., join E B and produce to F. Draw F G at right angles to A C. F will be "point of station," F G the "central visual ray," and A C the picture plane.

Angle E F C equals 45 deg., E F A equals 45 deg. Had A D E been made 60 deg. or twice 30 deg., E F C would equal 60 deg., E F A equal 30 deg.

The scale must be determined from some parts of the building the actual sizes of which one either knows or can arrive at from internal or external evidences, such as the courses of brickwork, figures in foreground, height of steps, lengths of down-spouts and various other ways. No architectural photograph should be taken without a vertical scale against the building. English photographers are more negligent in this matter than those abroad.

It is a pity the architectural perspectives at the Royal Academy Exhibition become more and more the work of a few specialists. I admit the difficulty for an architect whose time is fully employed being able to make his own views for exhibition; it is a subject that crops up for discussion every now and then. I can bring to mind a view of the entrance tower and semicircular wing of the Midland Grand Hotel; it was on two sheets of antiquarian paper joined. I was making it just at the time of an outcry that all works submitted to the Royal Academy should be the actual work of the exhibitor, and it moved Sir Gilbert Scott to write to the President pointing out that an assistant of his had spent about a fortnight on his stomach, and asking whether such a penance was required of him. This recalls an experiment made about this time in one of the rooms at Spring Gardens, and the sight of three or four men trying to do their work with maul-stick and easel, some even perched on their stools on the desks.

I have been pleased of late years to see an increasing number of pencil perspective drawings; it is a charming medium for not too large views, and is, I find, very much appreciated by one's clients. The difficulties of reproduction, which no doubt formerly stood in the way, have been quite overcome.

Mr. R. PHENÉ SPIERS proposed a vote of thanks to Mr. Weatherley for his paper, which was seconded by Mr. H. W. Brewer, and supported by Messrs. A. Beresford Pite, Paul Waterhouse, B. F. Fletcher, Arthur Baker, W. G. B. Lewis, and carried by acclamation, and the proceedings terminated.

PRESERVATION OF EGYPTIAN MONUMENTS.

THE following draft scheme for an archaeological survey of the Nile Valley, from the First to the Second Cataract, has been prepared by a committee consisting of Sir Colin Scott-Moncrieff, K.C.M.G., Professor Norman Lockyer, C.B., F.R.S., and Mr. Somers Clarke, with Mr. Alan S. Cole as honorary secretary, representing the Society for the Preservation of the Monuments of Ancient Egypt:—

A.—REGION TO BE INVESTIGATED.

The following list of places is necessarily imperfect, as a close examination of the valley in its whole length has not been made for the purpose of the present investigation.

1. Philæ.
2. Bigga.

3. The adjacent Islands.
4. Arab remains on the east bank immediately south of Philæ.
5. Rock and boulder inscriptions round about, on Bigga, Philæ, Shellal, &c.
6. Dabod. Temple and approach thereto. Quarry in the hill behind.
7. Dimri. Temple. Remains in brick: Coptic? Arab?
8. Markos. Island. Brick remains thereon.
9. Kertassi. Temple. Quarries. Graffiti. Girdle wall within which must be temple remains.
10. Kalabsha. Temple. Quays. Walls. Quarries. Beit el Wali. (Above R. L. 118 mètres.)
11. Tafa. Temple. Houses. Site generally.
12. Abu Hor. Quay wall. Temple?
13. Dandur. Temple. Terrace. Site of town.
14. Gerf Hussein. Rock temple (above R. L. 118 mètres). Approach.

15. Kirsh. Walled town. Coptic church.
16. Koshtemna. Fort. Town.
17. Dakka. Temple. Town.
18. Kuban. Fort. Temple. Tomb pits.
19. Korti. Foundation of temple. Site of town. Mound.
20. Maharaga. Temple.
21. Mahendi. Town. Ruins of Coptic churches. (Above R. L. 118 mètres)
22. Coptic church on west bank near Sebua.
23. Sebua. Temple, partly in rock. Approach. (Temple above R. L. 118 mètres.)
24. Amada. Temple (above R. L. 118 mètres).
25. Derr. Rock temple (above R. L. 118 mètres). Rock tombs, probably below water line.
26. Fort on west side of river.
27. Elesiyeh. Rock tomb (probably above R. L. 118 mètres).
28. Ruins of town opposite Elesiyeh.
29. Aniba. Brick pyramidal tombs and burials of all sorts. (Rock tomb of nineteenth dynasty, above R. L. 118 mètres.) Above this it is supposed that everything will be above the highest level of reservoir.
30. Kasr Ibrim. Roman town. Coptic church with graffiti. Rock tombs. Stele to south.
31. Ermenna. Ancient town and tombs on west bank. Stelæ. Inscriptions. Coptic church on east bank.
32. Abu Simbel. Rock temples. There are, almost certainly, remains of a town just north of this on the west bank.
33. Jebel Adda. Rock tomb. Ruined city on Jebel.
34. Kasr el Wiss. Fort on the hill, probably Arab.
35. Farras on west bank. Rock tombs. Early Coptic texts. Fort, probably Roman. Coptic church opposite side of river.
36. Serreh. Temple of Rameses II. on west bank. On east bank, Egyptian fort, enclosing Coptic church and town.
37. Argin. Coptic church, mound and ruins.
38. Wadi Halfa. Two temples. Ditch cut in rock enclosing temples and dwellings. Tomb. Graffiti.
39. Abusir. Coptic remains, church, &c., just below the rock.
40. Matuka. Egyptian fort. Double walls. Temple of Usertesen III. within. Another fort on the island opposite. Ruins. Coptic? on small island in the middle of the cataract.

In addition to the above antiquities at places named, it must be added that graffiti hieroglyphics, Semitic and Greek, occur on isolated rocks or cliffs on either side of the river. These require careful examination and copying.

We would propose that the survey should commence with a preliminary reconnaissance, providing a general map and maps of sites as detailed in C, to be followed by plans of the buildings and special inquiries indicated in subsequent sections.

We think it probable that, under the special circumstances of the case, if the maps and plans above referred to cannot be prepared for publication in Egypt, application to the Board of Agriculture might secure their multiplication and reduction by the Ordnance Survey. Such a course would secure perfect reproduction and a great economy.

We propose that illustrations, other than plans, should be based on photographs, to be subsequently processed in printer's ink. This would secure permanency and great economy and avoid all the expenses of hand illustration, which alone was available in the expeditions of 1789 and 1844.

We also suggest that a non-commissioned officer of the Royal Engineers, who has passed through the photographic school at Chatham, should be attached to one of the companies of Royal Engineers stationed in Egypt, and be employed in obtaining the photographs.

B.—TOPOGRAPHY.

The general survey of the region may possibly be based on the engineer's map, and plotted on a scale of 100000.

All special sites should be specially surveyed on a scale of 10000, giving precedence to the districts and buildings below the contour of 118 mètres R. L. These sites may be classified

as follows:—1. Temple fields. 2. Forts. 3. Old cemeteries, including circles, &c.* 4. Groups of rock tombs. 5. Old towns and prehistoric sites. 6. Mounds. Magnetic variation to be astronomically determined at each site, and true (astronomical) north to be shown on every map. Contours to be given, say to 3 mètres.

C.—PRELIMINARY RECONNAISSANCE.

First Stage.

It is suggested that the complete detailed survey may be preceded by the undermentioned inquiries. 1. A contour line at R. L. 118 should be shown on the general topographical map. 2. All sites likely to be occupied by cultivation or dwellings should be noted. 3. The feasibility of placing cofferdams or earthen embankments round buildings liable only to slight flooding should be considered. 4. Noting extent of cemeteries. 5. Cataloguing graffiti that will be flooded.

Second Stage.

1. Detailed mapping of sites, plans of temples, &c. (see D). 2. Photographs of all visible inscriptions. 3. Obtaining levelled height of each temple floor above Nile water at some stated date (so as to compare with Aswân and Halfa gauges). 4. Obtaining proper names in the Nuba dialect of every site. 5. Examine, plan and level all the ancient training spurs on the river banks. 6. Note all evidence of the Nile having been at a different level in historic times. 7. Search for all stages of graffiti, &c., near the river level, and all that are dateable, with record of what can be reached on foot or otherwise.

D.—SUBSEQUENT LOCAL INVESTIGATIONS.

Plans, &c.

Plans, sections and elevations of buildings may be plotted to a scale of $\frac{1}{100}$. General plans of a group of buildings may be plotted to a scale of $\frac{1}{400}$. The buildings may be classified as follows:—1. Temples with temenos walls. 2. Walls of and structures in forts. 3. Special parts and buildings of towns and prehistoric sites. 4. Tombs and rock tombs. 5. Churches and monasteries. The true (astronomical) north to be shown on each plan.

E.—WORK TO BE DONE IN EACH TEMPLE.

a. Foundations and Architecture.

Fallen stones to be examined before removal for the purpose of noting which part of the building, whether roof or walls, they came from; and how the fallen parts were constructed—the material, the jointing-dowels. Clear the sand or débris sufficiently to secure a plan complete in every respect. The position of everything found to be shown on plan. Amplitude of temple axis. Elevation of horizon as seen along axis. Search for crypts. Order and date of various parts of the structures, especially of the foundation deposits and of the successive foundations, showing all straight joints, alterations, additions. Methods of construction, nature of material, average dimensions of stones. Pavements, with all marks and indications thereon. All alterations in pylons to be noted. Photographs of all architectural features of importance.

b. Sculptures and Inscriptions.

Photographs of all sculptures and inscriptions, whether on standing or fallen parts, to be made to scale. The position of all such sculptures and inscriptions to be shown on key plans, elevations and sections. Squeezes to be taken wherever possible, to assist the photographic record. Stamps on bricks to be recorded. Graffiti.

c. Colours.

Vehicle. Traces of gilding. Notes of Coptic painting. Colour.—State whether on sculpture or on unsculptured walls, whether on plaster, whether drawn only, and not finished.

d. Pottery and other Objects.

These are to be collected and sent to museum after careful descriptions have been made.

F.—WORK TO BE DONE IN EACH FORT.

a. Foundations and Architecture.

Turn over all soil inside and around. Fallen masses of débris to be examined so that the position they occupied and their relation to the still standing walls may, if possible, be ascertained. Clear sand and débris sufficiently to secure a plan complete in every respect. The position of everything found to be shown on the plans. Observe method of construction, nature of materials, dimensions of bricks, methods of laying, whether with reeds between each or several courses, whether made with or without straw, whether the courses are laid level or undulating, or sloping with the fall of the ground, methods of bonding (if any), bond timber, holes through walls, state and condition of wall faces, and method of bond as shown

on wall faces. Order and date of various parts of the structure, showing all straight joints, additions and varieties of brickwork. Note exact position of foundation deposits, manner of approach to the wall tops, ramps, stairs. Gateways, whether stone lined. Any signs of communications. Plan of structures of whatever nature within the walls, notes of brickwork, stone-work of these structures. Plan of any structure other than modern houses around the outside. Ditches, outworks, paths or roads, wells.

b. Sculptures and Inscriptions. c. Colours. d. Pottery and other objects.

G.—WORK TO BE DONE IN EACH ANCIENT TOWN.

a. Foundations and Architecture.

Plan of town, with its relation to the Nile and surrounding valleys, roads, or forts. Walls (see instructions with regard to walls of forts). Gates (see instructions as above). Whether any part of town is artificially raised, or mounds, or substructures. The nature of these. Houses.—Observe their construction and dates of brickwork, whether all of stone, all of brick or partly of stone and partly of brick. Methods of constructing vaults. Streets. Public buildings. Temples. Churches. Mosques.—Observe their methods of construction, whether altered to suit purposes other than those for which they were first built. Houses.

b. Sculptures and Inscriptions. c. Colours (if any). d. Pottery and other Objects.

H.—WORK TO BE DONE IN EACH ANCIENT CEMETERY.

a. Architecture, &c.

Only a limited number of the most typical stone or brick built tombs to be dealt with. Description of different structures, with plans, elevations and sections. Materials. Plan made of every grave opened, showing the position of everything found in it. Strict marking and separate packing of objects of each group or tomb uncovered. Method of burial: whether mummied or more simple method.

b. Inscriptions. c. Colours. d. Pottery.

Description of everything found within. Photographs and drawings of most important objects.

K.—ANTHROPOLOGICAL AND ETHNOLOGICAL INQUIRIES.

ARCHÆOLOGY IN YARMOUTH.

THE annual meeting of the local Archæological Society was held last week in the Town Hall of Yarmouth. The Mayor presided, and said the Society held a very honourable position. In that old town they had many interesting records of the past, and it was most valuable that there should be a Society of this kind not only to look after these records and to take care of ancient remains, but also to call public attention to them. It was a Society with which the townspeople should be in touch, and he was glad to have been a member for some years. He wished to call attention to the fact that another portion of the interesting Greyfriars' Monastery had lately been secured. Five hundred pounds was now required to preserve this relic of the past. He could not but acknowledge the efforts of their indefatigable local secretary, Mr F. D. Palmer, who had thrown great zeal into the work, and ever took the liveliest interest in their old town.

The *Norwich Mercury* gives the following account of the proceedings:—The Hon. Secretary presented the report for 1894, which stated that visits were paid in the summer to Halesworth and the district, and also to Langley Abbey and other places on the Yare. In September last an opportunity offered for the purchase of a further part of Greyfriars' Cloisters, of which the Tolhouse trustees availed themselves and were now appealing for funds for this purpose. Mr S. Lucas, A.R.A., had written an interesting article on these remains. The action taken by the Society in regard to a museum had resulted in the Corporation undertaking a scheme, and it was hoped that a building now being erected in the rear of the great hall of the Tolhouse would be opened and dedicated to the public at an early date. During the year 3,040 visitors paid entrance fees to the Tolhouse, and 1,190 copies of the guide were sold. The committee maintained its numbers, and there were now 100 members. The balance-sheet showed the year was commenced with 7*l.* 1*s.* 9*d.* in hand, and ended with 6*l.* 10*s.* 3*d.* on the credit side. The Tolhouse account balanced itself within 18*s.* 1*d.* There was no need for the Society to have large funds, and it only needed to pay its way. So far as possible the subscriptions were used in connection with the Society.

The Hon. Secretary said that the paper he read last year on the parish of Eccles was to be reproduced by the parent Society. They were all very sorry to see that the old landmark had been swept away.

Mr. Carter said some ancient papers had been presented by Mr. Goldwin, of Colchester, and on the back of one of these he found specimens of early shorthand, dated 1681.

* There must be large cemeteries buried underground in the neighbourhood of the temples and great towns; these ought also to be sought for and excavated.

Preservation of Ancient Documents.

Dr. Duckett said that there were some very ancient documents in the town, which were built up in the old Guildhall in the churchyard for some 300 or 400 years. People had no notion of their great age. The oldest dated back to 1292, and a great many of them went back to 1300 and 1400. They were in the possession of the Corporation, and it would confer a great benefit if they could be translated and printed. He therefore moved, "That this Society trusts the Corporation may in the near future direct that its ancient leet rolls be published in a similar form to those recently dealt with by the Corporation of Nottingham."

Mr. E. T. Ayers, who seconded, hoped that all the historical documents in the borough would be included. He was informed on the best authority that in the possession of the Corporation there were ancient records of which they were ignorant. The Clerk of the Peace had some very ancient records in his office, and he would like to see all these preserved before they perished.

Dr. Duckett accepted the addendum, and the resolution was passed.

The Hon. Secretary announced that he had received from Colchester two charters, dated 1200 and 1500, with very fine seals attached, which were in excellent preservation. One referred to the appointment of attorneys, and the other related to some land.

Yarmouth Leet Rolls.

The Rev. W. Hudson, F.S.A. (Norwich), read a paper on "Yarmouth Leet Rolls." He said the earliest roll of the Leet Courts of Yarmouth was dated 1366. The term "leet" was used in very early times in East Anglia to denote divisions of a town such as were now called wards, but properly it was a division of a hundred. In Norman times there seemed to have been a tendency to such divisions. It appeared to him that these leet divisions were not of early date, as they described artificial and not natural divisions. Four leet courts were held in Yarmouth—the North Leet, held on June 1; the North Middle Leet on the same day; the South Middle Leet on June 22; and the South Leet on June 23. In the leet rolls no specific days were mentioned, but they only set forth that the courts were held so many days after certain religious feasts. Each leet court had its own jury of presentment, twelve in number, called capital pledges. Some of the offences dealt with were described by the reader. Amongst them were raising the hue and cry without sufficient cause, breaking the assize of beer—that was, selling it at a higher price than that fixed by the bailiffs. Three cases of infringement of the market laws were interesting. One was forestalling of goods on their way to the market for the purpose of selling them at an increased price; forebarring, that was forestalling of goods outside to sell them elsewhere, and not in the local market at all; and regrating, or buying goods in large quantities in the market and retailing them in smaller quantities at higher prices. Another offence was following two trades at once. He found millers fined for being bakers as well, and drapers punished for being tailors also. The system, he said, was fairly tried, and died a natural death from its ineffectiveness. Examining one roll, he found that men were punished for removing goods from ships by night, and thus defrauding the bailiffs of their customs. He also found mention of regulation of the size of nets to be used by fishermen. The fines were assessed by some of the capital pledges. One of the fines he found was 6d. for causing blood to flow from a man until his life was despaired of. The whole system was very much suggestive of the game of forfeits, in which every one paid something, and no one was the worse for the process. One roll, dated 1380, he found to contain a record of the ships arriving, the ports they came from, the cargoes they brought, and the dues they paid. He urged that some of the members should devote a little labour to translating and reproducing some of these rolls.

The Mayor said they were much obliged to Mr. Hudson for his very interesting paper, which cast a good deal of light upon the ways of our forefathers. When the whole of these rolls were translated, he thought much interesting reading would be forthcoming.

Dutch Remembrances in Yarmouth.

Mr. R. H. Teasdel next read a paper on "The Dutch in the District." During the late summer some extensive repairs were effected in the South Pier at Gorleston, and from the soil used for filling the inside of the work a fragment of Dutch pottery was unearthed, bearing the date 1592. Probably what struck the travelled visitor to Yarmouth most was its foreign and Dutch-like aspect, doubtless more conspicuous 100 years ago than now. Evidences of Dutch taste were then exhibited in the cleanliness of the streets, the many flower gardens with wooden summer-houses, the quaint porches attached to the houses, the flat-topped limes, the Dutch clinkers, the posts and chains in front of the houses, the mirrors or reflectors outside

the windows, appropriately called "espions," and the hooks on the walls for the suspension of tapestry on high days and holidays. Much had gone, but much remained. The South Quay had been likened to the Bempjee at Rotterdam, and there were further points of resemblance in the quaint old red brick gables in the rows, the frequent Dutch tiles on the older houses, and the incised slabs with armorial bearings in the parish church. It was probable that this district, which much resembled Holland, owed its system of drainage to Dutch experts, while many of the terms used in marsh farming here were said to be borrowed from the Dutch. From an early period Dutch fishermen frequented Yarmouth during the Free Fair. In the reign of Henry III. an inundation of the Low Countries drove to England a large number of Dutch artisans, and many settled at Yarmouth. Edward III. greatly encouraged these immigrants for the sake of their skill in cloth manufacture. Philip II. also drove over numbers of Dutch and Flemish Protestants, 300 of whom settled in Yarmouth and taught the inhabitants to prepare, pack and brand herrings in the Dutch fashion, greatly to the advantage of the port. In 1586 Queen Elizabeth granted them permission to dwell in the town and pursue their avocations, but jealousies arose, and in 1574 the Corporation imposed stringent restrictions upon the settlers. In 1569 an attempt was made to expel them, a conspiracy being hatched at Norwich; but it was detected, and its leader and two others hanged. St. Bartholomew's Massacre in 1572 increased the number of Dutch and French refugees, and the Revocation of the Edict of Nantes brought a fresh arrival. The building now occupied on the South Quay by the Public Library was granted the Dutch by the Corporation as a place of worship, but they were required to keep in repair a clock on the face of the building. It was called the Dutch chapel, and so occupied until 1681, when owing to the war with Holland the last of the once numerous colony left Yarmouth never to return. The Sunday before Michaelmas Day was called the Dutch Sunday. During the day there was considerable traffic in pipes, Dutch toys, ginger-bread and "Domino clumps." In the evening the Dutch fishermen paraded the town shouting songs, and next day went to sea. It was the custom for the Dutch and Flemings to be hired by Yarmouth merchants for the fisheries, and their influence on the language was shown in our sea terms of sloop, schooner, yacht, boom, skipper, taffrail, which were still employed as Dutch. It was also stated that a Yarmouth sailor would have no difficulty in making himself understood in Antwerp and Rotterdam. Mr. Teasdel also referred to the construction of the present harbour by a Dutch engineer, Joar Johnson, who was paid at the rate of 4s. a day for his services.

At this point an adjournment was made to the entrance hall, where was a loaded refreshment buffet, evidence of the hospitality of the hon. secretary. The members, returning to the committee-room, inspected there several curious old stones, pieces of pottery, tiles, &c., found since the high tides at Gorleston. One stone showed traces of beautiful carving, and was no doubt a piece of one of the old Gorleston churches, for much material from them was used in making the present haven.

A paper was next contributed by Mr. E. T. Ayers on

Norfolk Field and Place Names.

The names and appellations of fields, roads, streams and particular areas and localities in England contain veritable mines of historical and traditional information of an interesting and instructive character. This information was to a very considerable extent hidden from general notice and observation, because many ancient designations had ceased to be in common use in their original sense, and the meanings of many had been entirely lost. Bearing in mind the various migrations and invasions, it was possible by a little attention and industry to arrive with tolerable certainty at the purport and meaning of most of these names. In every community it was a matter of necessary convenience that distinctive names should be given to places, and those names would naturally in early times be given with some correspondence to the situation and character, whether high, low, level, or uneven, the nature or products of the soil, neighbourhood to the dwellings of man, rivers, &c. Accordingly in Norfolk he found in the names of localities, fields, roads and streams traces of (1) the ancient Celtic or primitive British language which was in use before the Roman conquest and the Anglo-Saxon invasions; (2) the Roman or Latin language; (3) the languages of the Angles, Jutes and Saxons; (4) the languages of the Danes, Swedes and Norwegians; and (5) the Norman French language. The primitive British or present Welsh language as a spoken language seemed to have been almost completely driven out of England. The Romans having made no attempt to colonise, few traces were left of the Roman or Latin language. The Anglo-Saxons and their allies, however, came over in vast numbers and really settled here, and their language obtained a wide and firm footing, becoming substantially the language of the country. The Danes followed their example, and considerable additions were

therefore made from the Danish, particularly in the seaboard counties of Eastern England, where they chiefly settled. Then the Normans enforced the use of the French language for 350 years, and thus added much more to our language. It was remarkable, however, that Anglo-Saxon continued to be employed in our homelier and more familiar ideas. Mr. Nall had pointed out that the names of almost every hamlet in the hundreds of East and West Flegg (Norse *flegg*, Danish *vlak*, flat), lying near Yarmouth, which were the most important of Danish settlements, were of Norse derivation, compounded of some common Danish personal name, and the suffix "by," such as Billockby, Clippeby. Other place names, by their terminations of ley, land, thorp or thorp, gan, toh or tone, strand, &c., showed their Danish origin. Mr. Ayers then quoted numbers of illustrative instances. The ruggedness of the Danish place names was remarkable, and they had the advantage of varying very distinctly from each other in sound, as Hemsby, Ormesby, Scratby, Oby and Billockby. So it was with most of the 512 Danish "bys" or "byes" in England. He found 90 instances of by, bi or bye in Denmark, 58 in Sweden and Norway, nearly all in Sweden. The uncommon names of Gambleby (in Cumberland) and Oby (in Norfolk) had their exact counterparts, and he also noticed Hycklinge, Bure, Horning and Stalheim, while names ending in tof, toft, vik or wick, dal, an, torp, darf, holm, fjeld, fjord, ham or hamm frequently occur. In Finland there were five "byes" near the shores of the Gulf of Bothnia. Names ending in en or em were frequent in Belgium, but no by or bye, and he did not find any in North Germany, and only one by and one bye in France. A writer in "Chambers's Journal" had pointed out that the names of rivers almost without exception denoted a great variety of qualities, smooth, rough, winding, sluggish, &c. Of the names which the Romans imposed there were exceedingly few traces, the most obvious being those in which the word chester or carter, from castra, a camp, were found. The names of places of Anglo-Saxon origin were seldom descriptive of sites or qualities, and very generally composed of the name of the original founder or proprietor in a corrupted form, with the addition of wick, burgh, thwaite, ham, ton or tun. Haddington was the place of residence of Haden, and Edinburgh the fortified settlement of Edwin, both Anglo-Saxon chiefs. In some instances the names were composed partly of Celtic and partly of Saxon or Danish terms, the one being grafted on the other by the succeeding races. Mr. Ayers then quoted typical words in illustration of his paper, particularly some of Celtic origin of great antiquity and still in use here, almost unchanged in form and meaning since the days when the aboriginal Britons roamed over this island.

OLD TORONTO BUILDERS.

A CORRESPONDENT of the *Canadian Architect* writes:—The dead past has not much interest to many whose lot is with the living present. As Artemus Ward has remarked, however, there is a pleasure in reminiscences of olden times, whilst Professor Wrong, of the Toronto University, in his lecture of a few days ago, is doubtless right when he says that many mistakes of the present would be avoided if people were better acquainted with the history of the past. "History is philosophy, teaching by examples," as another writer has said.

Though untempted to delve deep into the buried past there are few who have not an interest in that particular past which relates to their own selves or their individual callings. This has been the thought of the writer, as he has allowed memory and historical incident and data to take him back to the days when Toronto was best known as Muddy York, and the magnificent buildings which are the pride of her citizens to-day were unknown.

To make a start at the beginning of the century, there came to York in 1800 Caleb Humphrey, a carpenter, builder and contractor. He was one of the pew-holders of St. James's Church from its commencement in 1803, and pioneers whose memories will enable them to locate the south-west corner of Toronto and Adelaide Streets, as it existed in those days, will remember Caleb Humphrey's house. More strictly speaking, the late John G. Howard, to whom the city owes a debt of gratitude for his handsome gift of High Park, ranks as an architect rather than a builder, and yet many of the early houses of Toronto were built by him. The first 11-inch plank side-walk on King Street was laid by Mr. Howard. He designed the spire on St. Paul's Church, Yorkville, in 1841, the work on which was performed by Mr. John Ritchey, the framing by Mr. Wetherald, and the raising was superintended by Mr. Joseph Hill. This was one of the curiosities of the time, and received significant mention in Dr. Scadding's "Toronto of Old."

A list of the inhabitants of York in 1805 includes in its numbers William Cooper, a builder, and owner of one of the first wharves and warehouses in York. Collin Drummond was

a builder and owner of a lumber-yard located in Yonge Street, between Wilton Avenue and Shuter Streets, the burning of which, with other properties, is still fresh among the boyhood memories of the writer. Henry Hales was a builder and contractor of the first decade of 1800. He had a brickyard at the south-east corner of Duke and George Streets. William Smith was a builder who came to York with Governor Simcoe, and was the first man to take up a building lot after the laying out of the town plot. This was located at the north-east corner of King and Sherbourne Streets, and the house which he built is still standing there. William Smith, jun., was a son and a builder. The boys of Toronto, who on Saturdays tramped out Yonge Street to Hogg's Hollow, remember well the Severn brewery in Yonge Street. This building was originally built by the father of the present John Baxter.

The recent burning of the new Globe building brings to memory the old Globe building, from which was published that journal when some of us were boys in our teens. It was familiarly known as Dallas's building, and was situated on the property where now stands the Canadian Bank of Commerce. Let us go back, however, to the days when the printing-press performed its mission on that site, and it will be remembered as the spot where stood in 1818 the first Methodist church at York. This remained a place of worship until 1833, when it was converted into a theatre. A memento of this church building is to be seen in a walking stick made from a portion of the altar rail by one who in those days was known as "Old Daddy Petch," and which later came into the possession of Mr. Robert Carroll, one of the best known contractors of the present day. Mr. Petch built the old church in question, and at one time was a partner of ex-Mayor Manning. By the way, I am reminded that Mr. Carroll is to the manner born, being of the fifth generation of builders bearing the name of Carroll. The history of the Globe corner of later days is well known. The old buildings were afterwards supplanted by the fine ware-rooms of Jakes & Hay, furniture manufacturers, to take their place later by the Bank of Commerce.

The firm of Metcalfe, Forbes & Co., or as they were sometimes known, The Company, were builders of the old Bay Street Presbyterian church, situated on the corner of Richmond and Bay Streets, and of which the Rev. John Jennings, D.D., was for many years pastor. John Ross Robertson, in his "Land Marks of Toronto," tells the story that early in the sixties a great storm occurred in Toronto, and one of the stone pinnacles at the south-east corner of the church was blown down and fell through the roof. The stone in its flight downward detached a piece of wood with a nail in it, which also fell, the nail piercing a Testament in one of the pews and puncturing the book through to the text, Matt. vii. 25, "And the winds blew and beat upon that house; and it fell not, for it was founded upon a rock." The firm of Metcalfe, Forbes & Co. were also contractors for Trinity College and other prominent buildings. James Metcalfe, of this firm, was well known to many as California Metcalfe, from the fact that he went off to that country and returned to Toronto a rich man, having struck it right in the gold diggings or elsewhere.

Messrs. Ewart & Parkes and Mr. Joseph Turton are known as the contractors of the old Parliament buildings. McDonald & Young make claim of having built the present city hall in 1845. The College Avenue of a quarter of a century ago was different from the College Avenue of to-day, and was a favourite excursioning point for the boys of that time. I can well remember the spot known as Sleepy Hollow, the residence of the Hon. John Beverley Robinson. This well-known residence was built by Mr. George Shaw, father of Alderman Shaw, and was the first building he ever put up.

The contractor for the masonry-work of Knox Church, Mr. J. Grant, was a familiar figure in building circles more than twenty-five years ago. He was known as Tam O'Shanter, because in addition to his business as a contractor he kept a tavern near Duchess Street, to which he had given this name. The carpenter-work of Knox Church was done by McBean & Withrow, the latter the father of the present John Withrow. The gas office, the building of the Trust and Loan Company, and other commercial buildings, were erected by A. Burrows, who was a contractor of prominence in Toronto thirty years ago. John Plenderleith's carpenter shop on the corner of Elizabeth and Edward Streets, taking in the larger part of a square, gave employment to many men in the trade, who are still to be met on the streets of Toronto. An old builder of those days, who keeps active in the service despite advancing years, is Mr. W. J. Hughes, a resident of Simcoe Street. He came to Canada in 1832. It may have been forgotten by many citizens that Mr. James Dobson, late postmaster at Yorkville, who died at the age of eighty-five years in December last, was a carpenter, and carried on building operations in the city for a number of years.

One of the best-known builders of more recent years, and yet an old-timer, was Mr. John Ritchey, who built Ritchey's Terrace, a row of houses in Adelaide Street, between Bay and York Streets, some of which are still standing, though ancient-

looking. He was born in 1796 and came to Canada from Belfast, Ireland, in 1819. He died April 30, 1866. He built St. George's Church, St. James's Cathedral, twice, before and after the fire; Judge Haggarty's residence, Simcoe Street; the old Lyceum for French in King Street W; the Dominion Express Company's offices, Yonge Street, and his last work was the Dilworth House in Jamieson Avenue. There are a few men in the building trades to-day who remember John Ritchey, and his name suggests to them interesting incidents in the methods employed by contractors in the olden days.

No sketch of the old builders of Toronto would be complete without a reference to John Harper, father of George Harper, a well-known Toronto architect of to-day. John Harper was a son of Richard Harper, who left Belfast, Ireland, for New York in 1810. The father remained a resident of that city until 1817, when the family removed to Toronto, and Mr. Richard Harper entered into the building business. John Harper, the son, followed the father's calling and built St. Michael's Cathedral, Trinity Square; the first general hospital, the first Toronto observatory and laid the foundation of the present asylum buildings. He also built what is now known as the Newsboys' Home, a building intended at that time for the Canada Company's offices. The first depôt of the Northern Railway was his work. John B. Smith, founder of the firm of J. B. Smith & Sons, lumber merchants, Toronto, and who died in March last, was a contractor rather than a lumber merchant in his early business days.

This much about old Toronto builders. The story is by no means exhausted. The digging process is an interesting one and much more could easily be unearthed.

THE PAINTINGS AT POMPEII.

IN a letter to the *Standard*, Mr. Fitzgerald Marriott, writing from Sorrento, says:—

I regret to say that during my long and thorough acquaintance with Pompeii I have come to the conclusion that it is not only the Harrys of Naples who spoil the frescoes with their autographs, but it is the English, American and German tourists who on free days collect quantities of mosaic and tear off pieces of fresco; and this not from places where it can be spared, but from walls and floors that are merely falling into decay, and need care rather than spoliation. At the *table d'hôte* in the Hôtel Suisse, and also at the Hôtel del Sole, I have frequently heard one tourist ask another how much mosaic he had managed to tear up. I have also seen the copyist of the pictures—a common fellow, employed to make tracings and copy in the colouring of the largest frescoes for the Naples Museum—scrape off with a knife small pieces of loose fresco paint in the House of the Wounded Adonis, utterly indifferent to the result. The walls in Pompeii used to be waxed, and this is the cause of the fine gloss on many of those seen by Mr. H. A. Kennedy; but owing to lack of funds and their misappropriation by certain officials this had to be given up, but I trust to see it soon commenced once more, as this waxing process is the only means of preserving the surface and the colour from the effects of damp and heat. I cannot agree with Mr. Kennedy altogether; he has quite overlooked the examples of the third style of wall-painting, which are the most delicate of all; the best example, alas! much faded, of the "Candelabrum" variety is in a room in the Casa del Centenario, that has a *solarium* on its threshold and is next but one to the locked-up room in that house. The finest example of the "Egyptian" variety is in the house of Cecilius Jucundus, in the *tablinum*; and others are in the Casa del Orfeo, and in the house in Regione IX., Isola 5, No. 18.

Mr. Kennedy's criticism of what Neapolitan taste values is very true—the authorities prefer all that is large and brilliant, not always that which is in good taste. One word I would like to add about the house of Siricus. He says, "The painted architectural intervals . . . stand upon basal panels composed of a harmony in yellows, rich, pale and reddish. They contain landscape subjects, touched in with the most airy lightness and delicately framed." Had Mr. Kennedy seen these some years earlier, or studied the contents of these and similar little round or square pictures for some years, he would have seen that they were pictures of houses and farmhouse scenes, from which much can be gathered of the general form of old Pompeian houses, both in and without the town. Those in the house of Siricus are about a foot square, and are much obliterated; there were six of them. For similar small pictures of houses see Gell's "Pompeiana" and the French edition, "Vues des Ruines de Pompei," p. 132.

I regret to differ also with regard to the woman in the picture of the *Drunken Hercules* in the *Exedra*; instead of Dejanira, she appears more likely to have been intended for Omphale, the Queen of Lydia, for love of whom Hercules

surrendered his lion's skin and club; Bacchus, with Fauns and Bacchantes, is represented in the upper portion of the picture laughing at the evident result of his wine, the moral being that strength becomes folly and weakness with over indulgence. Had the female figure been Dejanira, the wife of Hercules, there had been no reason to represent him as drunk (see "Notes on a Few Houses" in our "Facts about Pompeii"). I must differ also from Mr. Kennedy in that all artists and students of importance whom I have ever met at Pompeii have always known the room in the Casa della Regina Margherita. Moreover, the guide-book "Baedeker," and I have no doubt also Murray, does mention it, so does Rolfe's "Pompeii;" a figure in the picture of *Narcissus* in this room used to have a club under its arm; it has become obliterated, but it has made me consider that the painting combined the story of Narcissus and his reflection with that of Hylas (the attendant of Hercules) and the jealous nymphs.

But I can fully endorse the remark that the authorities seem to think that further excavation is more popular than immediate preservation, or even than the completion of the excavation of the five-storeyed houses in Regione VIII.; and in the meanwhile they are wasting time and money to please an unappreciative Neapolitan population, little thinking that Englishmen, whether simply tourists or students of archaeology like myself, can appreciate what is truly interesting and already find in Pompeii quite sufficient to study.

GENERAL.

The Sales of pictures from the last exhibition of the Glasgow Institute of Fine Arts amounted to 3,378*l.*, an excess of 15*l.* beyond the sales of the preceding year.

The Exhibition of the Dudley Gallery Art Society will open on Monday next. To-morrow there will be a private view.

Archdeacon Sheringham, treasurer of Gloucester Cathedral Restoration Fund, announces that 1,335*l.* has been subscribed for the special Lady Chapel Fund. To complete the work another 800*l.* is needed.

The Report of the improvements committee of the London County Council, which recommended the construction of a roadway from Whitechapel to Tower Bridge, was rejected on Tuesday.

"Lanigans Folly," a tower which stood on the mountainous ground near Borrisoleigh, co. Tipperary, succumbed during the late gale. It was a costly and useless structure, and as it was built on sand there is surprise it endured so long.

Mr. W. Kaye Parry, M.A., has been appointed by the Board of Trinity College, Dublin, examiner in practical sanitary engineering for the qualification of State medicine in the University of Dublin.

Mr. Leonard Stokes will read a paper on "Observation" at the meeting of the Liverpool Architectural Society, on Monday, the 11th inst.

Mr. Alan S. Cole will deliver the first of the series of Cantor lectures at the Society of Arts on Monday, the 11th inst., on "Means for verifying Ancient Embroideries and Laces."

Mr. Norman Macleod, who was for several years secretary to the Science and Art Department, died in Paris on Tuesday in his eighty-second year.

Mr. Arthur Blomfield Jackson has been appointed a surveyor under the Ecclesiastical Dilapidations Act to the diocese of St. Albans.

The French Minister of Education, on Wednesday, applied for a further grant of 150,000 francs towards the expenses of the excavations at Delphi, which are in charge of the French School at Athens.

The Arts Committee of the Walker Art Gallery, Liverpool, have received a letter from Messrs. Walter and Stanley Russell, executors of the late Mr. T. R. Russell, offering to present to the gallery, in memory of their late father, the life-sized marble figure entitled *Fate-led*, by Mr. Albert Toft.

The Paisley Art Institute Exhibition was closed on Saturday. Fifty-four paintings have been disposed of and a sum of 338*l.* realised.

Mr. Abraham Mosley, of Northampton, has been appointed surveyor to the Finedon Urban District Council.

A Picture by Mr. T. Y. Titcombe, *Primitive Methodists*, which obtained a prize at the Chicago Exhibition, has been presented by Messrs. Grainger & Smith, of Dudley, to the local art gallery.

The Institution of Civil Engineers will meet on Tuesday, the 12th inst., when the discussion will be resumed on Mr. J. Richardson's paper, "The Mechanical and Electrical Regulation of Steam Engines."

The Architect.

THE WEEK.

THE death of M. JEAN PORTAELS is a great loss for Belgian art. As he was born in 1818, he had exceeded the three-score and ten limit, but he was so hale and hearty a gentleman he seemed likely to be competent to paint and to direct the Brussels Academy for several years to come. When we illustrated some of his works we said that one of his pictures was known to every visitor to Brussels. We referred to the fresco which fills the pediment of the church in the Place Royale. After forty years of exposure to the weather it is still most brilliant. M. PORTAELS was born in Vilvorde, Brabant, in 1818. He studied under the Belgian-master NAVEZ, and afterwards he went to Paris and worked with PAUL DELAROCHE. M. PORTAELS spent several years in Rome, and then, like so many of his contemporaries, he was attracted to Egypt. From that country and the eastern part of Europe he derived many of his subjects. He hated the commonplace, and the Bulgarians, Slaves and kindred races secured his preference. Tragic scenes were often painted by him, such as *The Suicide of Judas*. Some of his paintings are to be seen in Belgian churches. As director of the Brussels Academy, M. PORTAELS exercised much influence. He never set up his own manner of treatment for the imitation of students. His aim was to encourage individuality as much as possible, and the number of excellent painters who were trained under him is the best evidence of his success.

THE members of the Glasgow Town Council do not appear to be doing themselves much credit by the reasons they give for raising an outcry against the publication of tenders for municipal works. They maintain that as in consequence of the appearance in the newspapers of the tenders for the tidal weir on the Clyde, the firm of contractors who stood lowest withdrew their offer, Glasgow has lost more than 4,000*l*. There is another aspect of the case which they have neglected to consider. Is it worthy of a great city like Glasgow to endeavour to have work executed at a price which would involve the contractors in a loss of over 4,000*l*? By one of those oversights which are common enough when tenders are being made up in a hurry, some items relating to the weir were omitted or undervalued. The error was perceived when the tenders were published, and the contractors prudently, and as they were entitled, endeavoured to save themselves from the consequences of a clerical error. That is only a petty way of dealing which tries to gain profit by obtaining things at less than their value, and which is indifferent to the losses of vendors. Glasgow did not, we hope, gain its position by commercial morality of that sort, and it is to be regretted that such laxity of principle should now prevail in any body of the citizens. It is, however, remarkable that the objection to the publication of tenders always arises from unfairness of some kind. At one time, as in Glasgow, there is a desire to take advantage of an error in calculation; at another time it is intended to assert that a building cost a sum which would not correspond with the tenders; or it may be there is a desire to conceal the fact that an excessive amount was expended on construction. Whatever may be the cause assigned, the object of the concealment means wrong to somebody. People who have a concern in the erection of buildings or the construction of engineering works, should know that publicity of tenders is nowadays the best guarantee for honest dealing, and intending purchasers of new buildings should always hesitate when they find (if there was competition for the work) that the tenders have been dealt with in a hugger-mugger way.

A RULE *nisi* was granted on Tuesday which will probably have eventually the effect of determining an important point in connection with the payment of district surveyors' fees. In the West Hackney district a row of fourteen houses was nearly completed when the builder became bankrupt. The work was taken up by another builder, and when the houses were finished the surveyor applied to him for the fees. He

declined to pay, on the ground that it was his predecessor who was liable, whereupon he was summoned. The magistrate of the South London Police Court dismissed the summons and refused to state a case. In applying for a rule which would oblige the magistrate to state a case, it was contended that *TUBEZ v. GOOD* which he relied on was not applicable. In that action the buildings had been completely roofed in, and the district surveyor had tried to get his fees from the owner when the buildings were fully finished. But in the present case, at the time when the first builder became bankrupt, some of the buildings were not completed and not covered in, and so the second builder was assumed to be liable for the fees. Although they may not have many friends, it is only fair that district surveyors should receive the fees to which they are entitled. As long as it is not possible to demand fees until fourteen days have elapsed after the roofing of a building, the builder for the time being would appear to have assumed the responsibility for the payment imposed by the Act. Under the new Act, in case of failure the surveyor can obtain his fees from the owner or occupier.

AT the last meeting of the Sunderland Guardians the house committee specially recommended:—That the plans of the proposed new infirmary as prepared by the architect be approved; that the front administration block, two pavilions, corridors, maternity pavilion, probationary pavilion, laundry and boiler-house and mortuary be erected (leaving the kitchen and staff apartments on male and female side to be erected at some future time), at the estimated cost of 34,725*l*.; that application be made to the Local Government Board for power to borrow a sum not exceeding 35,000*l*., to be repaid in thirty annual instalments of principal, with the interest on the balance remaining each year. The Chairman explained that, under pressure of the Local Government Board, the Guardians were compelled to erect an infirmary. In the competition the plans of Mr. J. SHIELDS were accepted. They would cost 50,000*l*. to carry out. Owing to the depressed state of trade it was necessary to restrict the expenditure to 35,000*l*. The recommendation was adopted.

ALTHOUGH the French never possessed a painter of more value than WATTEAU, it is remarkable that neither the Louvre nor any of the galleries possesses an adequate number of his works. Still more strange is the absence of any statue of the painter, although men of infinitely inferior interest have their memorials in bronze and marble. Efforts are now making to remove the discredit which arises from the latter cause. A statue of WATTEAU is to be erected in the garden of the Luxembourg. The competition among the sculptors was determined a few days ago. Some of the models had to be set aside on account of their expensiveness. After a long discussion it was decided to select a model submitted by M. GAUQUIÉ, the architectural part being designed by M. H. GUILLAUME.

COMPETITIONS are rare in Ireland, and it is therefore not surprising there is a delay in selecting the design for the proposed lunatic asylum which is to be carried out at Portrane. At the meeting on Tuesday of the governors of the Richmond Lunatic Asylum (for the new buildings will form a country branch of that institution) a letter was read from the Board of Control suggesting a conference with a committee of the governors. The Board of Control also forwarded the report of Messrs. PATTERSON & KEMPSTER, the surveyors employed to prepare estimates of the cost of each of the three designs for the Portrane Asylum, submitted under the names "Aspect," "Luna" and "Mens Sana," which were selected out of all submitted. The Board of Control thought the design marked "Aspect" most suitable. They were, however, not prepared to adopt a plan which would entail an excess of the prescribed sum. The designs also had been declared by the committee of selection to be of equal merit. "Aspect" was by Mr. G. C. ASHLIN, and the surveyors' estimate of the cost of that design was 246,135*l*. The estimate for "Luna" (Messrs. RAWSON CARROLL and BATCHELOR) was 229,910*l*., while that for "Mens Sana" (Mr. KAYE PARRY) was 211,172*l*. It was decided to hold the proposed conference to-morrow.

WHEWELL AND ARCHITECTURE.

IN the course of the century which has elapsed since WILLIAM WHEWELL was born in Brock Street, Lancaster, we doubt if a more versatile man appeared in England. He might be considered as the last of the scholars who could claim to have taken all knowledge for their province. He was Mathematical Lecturer in Cambridge in his twenty-fourth year. Ten years afterwards he was appointed Professor of Mineralogy. Another decade passes, and he becomes Professor of Casuistry. When the Lowndes Professorship of Astronomy was vacant he tried to obtain it, and there were no doubts about his competence. He founded a chair of International Law, and it was understood he intended to be the first occupant. At another time he appeared to be anxious to see himself Professor of Architecture. He served in various offices in the University, and ultimately became Master of Trinity College. Yet with all his labours there was a time when he wished to increase them by taking charge of a parish.

WHEWELL'S writings are no less remarkable for their variety. The story which is told of the graduate who wished to diminish the master's reputation for omniscience by getting up the subject of Chinese music, and after exhibiting his knowledge discovered that he was wholly indebted to WHEWELL'S articles is, like many others of the same sort, a testimony to the belief which was held in Cambridge about WHEWELL'S amazing industry and his interest in everything. The Bridgewater Trustees considered he was the best fitted to write about "Astronomy and General Physics considered with reference to Natural Theology." His "History of the Inductive Sciences" and "Philosophy of the Inductive Sciences" have become classics. Although JOHN STUART MILL was opposed to many of the conclusions, he testified that WHEWELL'S writings are by a man of extraordinary attainments, and eminently serviceable in clearing from confusion the initial steps in the analysis of mental processes. For many WHEWELL'S books on "Moral Philosophy" and "Political Economy" are no less important. Then there are translations of "The Platonic Dialogues," treatises on various branches of mathematics and physical science, translations from the German, poems, sermons, &c. Most of his works were made subjects for discussion, and the replies to opponents occupied much of his time.

For a man who was so active and various in his pursuits, a subject more or less would appear to make little difference, and it might easily be assumed that he cared as little for architecture as for Chinese music. There were reasons which made architecture one of WHEWELL'S pet studies. Primarily it must be granted that early associations were in favour of the art, and especially Gothic art. WHEWELL was the son of a master carpenter. When it was proposed that the boy should be removed from the Blue School to the Grammar School, his father replied, "He knows more about parts of my business than I do, and has a special turn for it." We may therefore assume that young WHEWELL possessed constructive ability. Then we must remember that Lancaster in the early part of the century was a picturesque place. As he once said at a public dinner, "In the drama of my life there are but two scenes, Lancaster and Cambridge, and the early scenes of Lancaster have been enhanced by the transition from one to the other." The parish church and the castle were never long absent from his mind. We may add there was another reason which operated in favour of Gothic. WHEWELL at an early age became one of the dons of his University, and in consequence it was necessary for him to appear in buildings which imposed on him all the inconveniences which belong to the Classic style—a style that was not intended for habitations or for climes where winter reigned, uncontrolled by constitutional checks, as in Britain. What had to be endured was described by WHEWELL in the account of his first appearance as a Moderator:—"The examination is conducted in a building which happens to be a very beautiful one, with a marble floor and a highly ornamented ceiling, and as it is in the model of a Grecian temple, and as temples had no chimneys, and as a stove or a fire of any kind might disfigure the building, we are obliged to take the weather as it

happens to be, and when it is cold we have the full benefit of it." Is it any wonder that, after undergoing privation of the kind, so many Cambridge men should be ready, like MONKBARNES, to suffer any sacrifice so long as Gothic and comfort triumphed? The Senate House in the days when heating by hot water was not much practised was a standing argument against a Classic revival.

But the most potent of all causes in determining WHEWELL'S predilection towards Gothic was that nature had made him a system-monger. In replying to some of Archdeacon HARE'S friendly criticism on his character he once said:—"If you had called me a persevering framer of systems, or had said that in architecture, as in some other matters, by trying to catch the principle of the system I had sometimes been able to judge right of details, I should have recognised some likeness to myself; but what you have said only makes me ashamed." But it was only with objective or external things that he cared to deal. The subjective was his abhorrence. In his early days he wrote:—"A man who is always looking for symptoms in himself will not often be healthful; a man who studies all the motions of all his limbs will not probably be graceful; and a man who is everlastingly watching the operations of his own mind and imagination is not likely to feel or to think freely." For a man who had that sort of belief there could hardly be a more attractive field than Mediæval architecture presented in those days. The history of the art was unknown, for there was no document forthcoming which would throw any light upon the intentions of the designers. Why might not WHEWELL aspire to bring order into chaos? As Professor of Mineralogy he was acquainted with the use which could be made of classification; was it not possible to accomplish a similar work with buildings? He had also a faith that was almost superstitious about the omnipotence of EUCLID and the applicability of a system of axioms, propositions and problems to all things from mechanics to morals. Accordingly he resolved to try his hand on the French churches.

The choice was characteristic. With all his power WHEWELL'S was not an originating mind. He prized his own translations, and much of his scientific and other work was only a sort of translation or paraphrasing on a big scale. In his architectural experiments he leaned on RICKMAN. But RICKMAN had not gone beyond England, and by taking up French cathedrals and churches WHEWELL was therefore appearing as a sort of pioneer. He was safe in having RICKMAN'S guidance, but the English architect was a most modest man, and would never have thought of proposing to himself such "problems" as WHEWELL started with:—

Are there in other countries the same successive styles of Gothic architecture as here, exhibiting the same leading characters, distinguished by the same differences? Are the same great leading characteristics accompanied by the same details and groups of minuter peculiarities? Where the styles come in contact, do they manifest the same transitions, the same mutual accommodations and imitations as with us? And, again, when we look at buildings with reference to their beauty, do the artists in the different countries appear to have been guided by the same principles and the same feelings? Each of the three styles of English Gothic has its peculiar kind of beauty, and probably each has its special votaries who admire the masterpieces of their favourite style as the perfection of the art. Do we find this to be the case elsewhere? And so far as we can detect the supreme aim, the perfect ideal, of the genuine artists of each of the English styles, do we again meet with the same thought, the same purpose, in the great works of successive ages on the Continent? In short, how close or how wide is the analogy which obtains in the principles and history of architecture in different parts of Europe?

His first tour in France was in the summer of 1823 with KENELM DIGBY, the author of the "Broad Stone of Honour," "The Ages of Faith," "Comptum," &c., as companion. They visited Abbeville, Dieppe, Lisieux, Caen, Mont St. Michel and other places in Normandy. According to DIGBY, a table was drawn up by WHEWELL, which displayed the distinguishing features of the styles. In 1825 he visited Germany, ostensibly for the purpose of examining the collections of minerals, but buildings received attention from him. Four years afterwards there was another tour through Germany, and parts of Switzerland and Italy were seen. WHEWELL had an introduction to MÖLLER, the architect, at Darmstadt, who told him how he became possessed of the old drawing of Cologne

Cathedral. The story is worth repeating, in MÖLLER'S words:—

"One morning," he said, "a young man came to me—a painter whom I knew, and offered me some old rolls of parchment, drawings of architecture; he had told me of them before; he described them as drawings of Strasburg Cathedral. I began to unroll the parchment. From a small portion of the lower part, I recognised Cologne. I had before drawn it, and I knew that the original drawings had disappeared. My wife, who was sitting by making coffee, said that I turned quite pale immediately. I told my friend that I should be glad to have his parchments, that I would pay him for them, which he declined. I had them unrolled then, found them what I expected, and was overjoyed. As to the history of the affair, it appears to be this. The treasures of Cologne were saved by being sent to Prague. At the peace of Luneville, the commissioners who were to settle the interests of the confederated States met at Darmstadt at the 'Grape.' All official papers were brought there; and among the rest, it would seem, these Cologne ones. After the arrangement of affairs, the French ambassador, who had the management of these matters, left a quantity of papers and documents, which appeared to him useless, to be disposed of by the waiter at the 'Grape.' Among these was this Cologne drawing. It was stuffed into a granary, was used for some time for drying beans, and might have lain there till now but for an event which brought about an illumination. Parchments were then sought out for transparencies, and among the rest it would seem that my friend, the painter, got possession of this one, which I had from him."

WHEWELL'S acquaintance with RICKMAN probably arose out of consultation over the results of the continental journeys, for in 1830 we hear of the two travelling in Devonshire and Cornwall. WHEWELL'S small book on the French buildings appeared in that year. In 1830 he also visited Yorkshire, and he describes Rivaux Abbey as the most beautiful object he had seen. WHEWELL and RICKMAN in the autumn went on a trip to Normandy. In appearance they were unlike, and from the contrast they excited curiosity. WHEWELL was a big man, and he describes his companion as "a very remarkable figure in his way; he wears the Quaker dress, which of itself would draw some notice, and being a little, round, fat man, with short, thick legs and a large head, he sets off the dress to great advantage. It is a difficulty for me to saunter along as slowly as he walks, and as, besides, he is perpetually running from one side of the street to the other to peep into whatever catches his attention, our motions are very irregular and apparently ill-connected, and we seldom move far without the honour of some special spectators." The two friends were arrested, as a matter of course, but the sight of a business card of RICKMAN'S overcame all the charges which were made, and they were set free. There was one other journey together to see some of the Northamptonshire churches. Afterwards WHEWELL went on his architectural excursions alone.

When WHEWELL went to Cambridge for the first time he was unable to give any account of the buildings, for, said he, "the fact is I am a desperate bungler at putting brick and stone into black and white." With him a difficulty was something to be overcome, and that he was able to treat one of the most difficult of architectural subjects in a lucid way is a testimony to his perseverance. The character of his conclusions was suggested by BOISSERÉE, when he said that WHEWELL too exclusively assumed the vaulting to be the leading principle in the development of Gothic. In every attempt to form a system some feature or principle must be allowed prominence, and while WHEWELL admitted that he might have over-estimated the importance of the vaulting, yet he could claim that by doing so he emphasised relations which exercised a powerful influence on the progress of the art. Sixty years ago people were not clear about Gothic architecture having principles, and the authority of WHEWELL on the subject was important. When he asserted, working, as it were, downwards, that in the style a new principle of connexion came first, and unity followed, "the lines of pressure are made the prominent features; the compound arches are distributed to thin props; the vaults are supported by ribs; the ribs by vaulting shafts; the upright meeting of the end and side is allowed to guide the neighbouring members; finally, the general authority of vertical lines is allowed; the structure is distributed into compartments, according to such lines, each of these being symmetrical in itself; the continuity of upright lines being established, the different planes of decoration glide into tracery and feathering, and the Gothic system is complete,"

WHEWELL was adopting the most effectual language to convince Cambridge graduates. By preferring to take the interiors for study, he treated buildings as organised things and suggested that all parts combined to attain one end. The vaulting became important in WHEWELL'S eyes, not only for its own sake, but because he believed that from the intersections the Pointed arch was suggested. He does not pose as the first to express that theory; any distinction which may belong to it (for he considered the origin of the Pointed arch is only a trifling inquiry) he leaves to SAUNDERS, WARE and KERRICH. But the invention of the Pointed arch in WHEWELL'S opinion was of less importance than the invention of the flying buttress, which enabled a church to become "a coronal upheld by the stony arms which the Christian architects learnt to make powerful and obedient for this purpose." WHEWELL was not, however, an admirer of excessive height. Amiens Cathedral he considered appeared short in consequence of its height, while Beauvais was absolutely shapeless, and, moreover, the outline of the exterior is obliterated by the number of buttresses. Yet Amiens continued to be one of his favourite buildings. When mentioning a visit to it in 1847, he said:—"It is two or three-and-twenty years since I first saw that building, and it then appeared to me one of the most magnificent works which is to be seen in the world, and so it appears to me still."

There is a vast difference between contemplating architecture with rapture and living amidst building operations. One cannot but pity WHEWELL when we read his account of the alterations at Trinity Lodge. "We had," he wrote, "seven sets of people, whom I used to speak of as our seven plagues, although this was rather an unreasonable way of speaking of them, as they came at our command and did our bidding. These were the masons, bricklayers, carpenters, joiners, glaziers, slaters and bellhangers." He must also have been amused when he received a letter from a contractor which began in the following rather novel way:—"Feelingly alive to this vexatious disappointment, I perfectly dread writing to you. To frame an excuse or falsehood, I cannot, but the truth, which is that the party who undertook the carvings has left me in the lurch; he was an Italian, an exceedingly clever artist; he has pirated our patent and gone to Milan." There is at least one use for foreigners in the building trades, they serve as scapegoats when there are delays. WHEWELL'S most important building work was the hostelry for students, which he erected at his own expense. But after all it cost hardly a fifth of the sum he laid out in connection with the chair of International Law, which amounted to more than 100,000*l.*, and yet in spite of the expenditure nations continue to be at variance.

THE TEMPLE AT NOCERA.

FEW travellers go out of their way to see the temple, which is now a chapel. It certainly does not much merit a sacrifice of convenience, and has little to justify the inflated description of Romanelli. The flooring of this small temple is 12 or 15 feet below the present surface of the soil; in consequence it is not unfrequently flooded, and thus hastened on its progress to ruin. The form is circular and the roof a dome; a conca or large marble basin that offers nothing particular, and that scarcely seems to be ancient, stands in the midst, and occupies one-third of the whole temple; a double row of columns, one row almost touching the other, runs midway between the conca and the walls; of these columns fifteen are of the Corinthian order, without bases. Eight pillars, about 10 feet high, which supported a little dome, were round the elevated edge of the conca, but only four broken ones are now standing. In the workmanship of the columns there is nothing fine. Romanelli says the materials are alabaster, granite and giallo antico; they are thickly crusted with green mould, but, as far as can be ascertained by a little scratching with penknives, they appear to be of no such valuable stuff. This temple suffered a change common to innumerable of its fellows, and altars and figures of saints still occupy the niches of the ancient gods; the accidents, however, to which it was exposed drove the priests to seek a drier spot, and they consequently built a little church that is attached to the temple, but at a level that exempts it from inundation. The temple, the ancient hallowed abode of purity, is now a foul cemetery. Two movable stone flags give access to the vaults underneath; one of these is inscribed *pro mulieribus*, the other *pro sacerdotibus*.

MICHEL ANGELO'S LIBRARY.

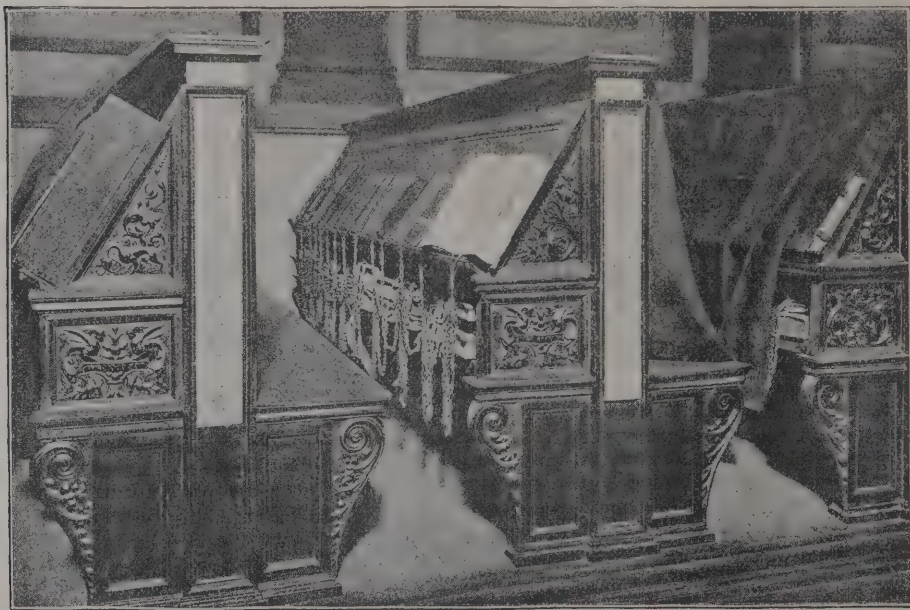
IN our notices on the volume on "La Fin de la Renaissance," by M. Eugène Müntz, being the third volume of the Italian Section published by the Librairie Hachette et Cie., we referred to the Laurentian Library in Florence. By the courtesy of the publishers we are able to publish three views of the interior. The building was one of Michel Angelo's earliest architectural works. It owed its origin to Pope Clement VII. He was one of the Medici, and was desirous to have a sacristy and library erected in connection with San Lorenzo as a memorial of his elevation. The commission was given to Michel Angelo. In the sacristy he became an imitator of Brunelleschi, but introducing, as Vasari informs us, details which were not sanctioned by the authority of Vitruvius or by the practice of older architects. In spite of all his admiration for his master, Vasari is compelled to acknowledge that the precedent was not an advantage for art, since it caused other men to employ *grotesque* instead of ornamentation of a proper sort. He has only words of praise for the library. According to Vasari, "the admirable distribution of the windows, the construction of the ceiling and the fine entrance of the vestibule can never be sufficiently extolled. Boldness and grace are equally conspicuous in the work as a whole and in every part; in the cornices, corbels, niches for statues, the commodious staircase and its fanciful divisions—in all the building, at a word, which is so unlike the common fashion of treatment that every one stands amazed at the sight thereof." Visitors to the library do not agree with Vasari in admiring the staircase, for the novelty is obtained by some sacrifice of convenience. But the library was probably better adapted for sixteenth-century readers than can now be realised. The illustrations are truthful, and suggest the care taken with the thousands of examples of all the arts which embellish the volumes by M. Eugène Müntz, and which uphold the credit of the renowned house of Hachette & Co.

very active part in collecting the remains of classical antiquity, so his wealth and extensive commercial intercourse enabled him to gratify his taste to the fullest extent. He enjoined his friends and correspondents, as well as the missionaries who travelled into remote countries, to search for and procure ancient manuscripts in every language and upon every subject. He availed himself of the services of the most learned men, his contemporaries; and the situation of the Eastern empire, then falling into ruins, afforded him an opportunity of obtaining



INTERIOR OF LAURENTIAN LIBRARY, FLORENCE.

many valuable works in Hebrew, Greek, Chaldaic, Arabic and other languages. After the death of Cosmo, his son pursued the same object with steady perseverance, and added considerably to the treasures which had been accumulated by his father. But although the ancestors of Lorenzo de' Medici had laid the foundation of the Laurentian Library, the honour of raising the superstructure belongs to Lorenzo himself, whose assiduity and liberality in enlarging his collection of books, manuscripts and antiquities, were unbounded. To this object his time and his fortune, exceeding that of princes, were equally devoted. Shortly after the death of Lorenzo, however, this matchless collection was dispersed by the Florentines themselves. In the disturbances which attended the expulsion of Pietro, and the approach of the French under Charles VIII. (1494), miserable plunderers openly carried off, or secretly purloined, whatever they could lay their hands on that was rare, curious, or valuable. Part of the library, however, was preserved by the interposition of the magistrates, but only to encounter new perils. The Florentine treasury becoming exhausted, the rulers of the day (amongst other expedients) sold the books to the Dominicans of St. Mark. At this point the history of the Laurenziana becomes linked with the fortunes of the still older library of that monastic community, a collection of which Cosmo may be said to have been the founder, conjointly with Niccolo Niccoli. The 800 volumes (or at least the survivors of them) which Niccoli had bequeathed to his fellow-citizens, and which Cosmo had redeemed from a lien that had well nigh annulled the legacy, and had committed to the custody of the Dominicans, were now united with what remained of the domestic library of Cosmo himself, and of the more splendid acquisitions of Lorenzo. But within two years the misdirected zeal of the impulsive Savonarola—for a while virtual King of Florence—scattered with lavish hand some of the choicest books as presents, and dragged others with con-



BOOK SHELVES IN LIBRARY.

The collection is not without its history. It was commenced, says Mr. Edwards, by Cosmo de' Medici, the father of a line of princes whose name and age, as Roscoe has said, are almost synonymous with the restoration of learning. "His credit," says Gibbon, "was ennobled into fame; his riches were dedicated to the service of mankind. He corresponded at once with Cairo and London, and a cargo of Indian spices and Greek books were often imported by the same vessel." As the natural disposition of this princely merchant led him to take a

tumely to a vast bonfire in the public square. In this wild *auto-da-fé* Boccaccios, Petrarchs and Pulcirs, in all the pomp of their rich illuminations and sumptuous bindings, mingled their ashes. With this result, amongst others—that the frenzied hatred of Dominican monks in the fifteenth century connects itself with the scarcely less frenzied love of English peers in the nineteenth, as cause with effect. Had no Savonarola burnt "Decamerons" in the Florence piazza in 1497, assuredly no Duke of Marlborough would have given 2,260*l.* for a "Decameron" in 1812. After Savonarola's death, the Dominicans, falling into embarrassment in their turn, sold their library (1508) to Pope Leo X, who caused it to be removed to Rome. It was reconveyed to Florence by his successor Clement VII., who, by a bull dated December 15, 1532, made provision for its future security. In 1571 the Grand Duke Cosmo I. made the library public. This library, the noblest monument which the Medicis have left of the glory of their line, contains 6,952 MSS., of which a very large proportion—despite so many losses and very strange vicissitudes—combine rarity and value. They have been described in a catalogue of thirteen folio volumes, compiled by the learned Bandini, formerly librarian, at the suggestion of the Emperor Francis I., who presented him with a sum of money towards the expenses, and made him promises of further assistance, which, however, were rendered unavailing by the death of that sovereign.

The most celebrated manuscripts in the Laurentian Library are the Virgil of the fourth or fifth century, the long missing leaves of which Mai had the good fortune to discover in the

THE LATE REGINALD STUART POOLE.

THE late Keeper of Coins at the British Museum, Mr. Reginald Stuart Poole, died at his house in Kensington on Friday morning, at the age of not quite sixty-three. Since his retirement from the Museum two years ago, after completing forty years of public service, his health had given way, and neither medical science nor change of scene and climate was able to arrest the gradual but premature decay of his energies. Finally a painful affection of the heart, endured with great patience, supervened upon nervous prostration, and the end came. Among the many distinguished scholars of the British Museum none was more popular in a wide circle or more beloved than Mr. Poole. He possessed one of the rarest qualities among men, a remarkable power of sympathy, together with a pure enthusiasm for learning, which made his influence a potent source of inspiration to his students. Few men have done so much by lectures, and still more by personal instruction and conversation, to encourage the study of Egyptology and antiquities among the general public. No head of a department has better succeeded in inspiring his subordinates with a high standard of learned work.

That he should have been able to exert so useful and encouraging an influence in so many departments of learning is the more remarkable when it is remembered that he was, to a great extent, a self-taught man. Born in London on February 27, 1832, the son of the Rev. E. R. Poole, M.A., of Trinity Hall, Cambridge, and of Sophia Lane, a grand-niece of Gainsborough, he was brought up chiefly by his uncle, Edward Lane, the



LAURENTIAN LIBRARY STAIRCASE.

Vatican; the famous "Pandects" of the seventh century, in two volumes, brought to Florence in 1406; a Tacitus, translated in the ninth century from one dated in the year 395; the "Decameron," supposed to have been written in 1384 by Amaretto Mannelli; the "Epistolæ Familiares" of Cicero, copied by Petrarch; a Tasso, with copious notes, in the hand of Politian; and many Dante MSS. of the highest interest, although but copies (Dante's autographs have perished), amongst them the celebrated letter discovered by Melus, and published first by Dionisi and afterwards by Foscolo.

Of printed volumes the Laurentian Library possesses comparatively few, having always been pre-eminently, and until recent date exclusively, a library of MSS. The famous collection of first editions of Greek and Latin classics, formed by Count Angelo d'Elci, formed an exception to the rule, and various other volumes have been presented by the authors.

The English Congregational Chapel Building Society held its forty-first annual meeting at Lewisham on Wednesday. The report showed that since the formation of the Society 830 cases of church extension had been aided, and that the grants and loans (free of interest) had amounted to 160,925*l.*, of which 152,714*l.* had been paid. The total value of buildings and sites thus secured for the denomination was estimated at 1,500,000*l.* The total receipts last year from all sources were 4,778*l.*

Orientalist. In 1842 Mrs Poole and her two sons accompanied Mr. Lane to Egypt, where he was engaged for seven years in accumulating materials for his great Arabic Lexicon. With the exception of a Nile voyage in the company of Sir James Outram, Reginald Stuart Poole spent those seven years in Cairo, where his education was superintended by his uncle and by a scholarly friend, the Rev. G. S. Cautley. His interest and enthusiasm were already engaged irrevocably in the study of Egyptology. So completely did he abandon himself to the study that in 1849, before he was seventeen, he was able to contribute a series of articles on Egyptian chronology to the *Literary Gazette*, which, after his return to England, were republished in book form in 1851 under the title of "*Horæ Egyptiacæ*." Though he saw reason in later years to abandon many of the conclusions there set forth, the fact that at so early an age he should have ventured to handle so thorny a problem speaks volumes for his industry and learning. The book was published under the auspices of Algernon, fourth Duke of Northumberland, the patron of Lane's Lexicon, and the same influence procured Mr. Poole's admission, in 1852, to the department of antiquities in the British Museum before he had attained his twentieth birthday. His reputation was already such that he received his nomination from all the three principal trustees, the Speaker, the Archbishop and the Lord Chancellor. He began very early to lecture, at Brighton and elsewhere, on his favourite topics of Egyptology and numismatics, and in May, 1864, he made his first appearance in a Friday evening lecture at the

Royal Institution, taking as his theme a subject he was never tired of emphasising—the importance of Greek coins as illustrating Greek art. On this subject, above all others, he was a pioneer, and the Munich specialist, Professor Furtwängler, has justly signalled the priority of Mr. Poole's discoveries in relation to the art of Magna Græcia. In a similar manner he brought the evidence of the coins of Camarina to bear upon the interpretation of the fourth and fifth Olympian odes of Pindar.

In 1866 Mr. Poole was appointed Assistant Keeper of Coins, and in 1870 he succeeded Mr. Vaux as Keeper. Thenceforward he devoted himself with exceptional zeal to the primary duty of publishing catalogues of the collections entrusted to his charge. For forty years no catalogue had been published. During his twenty-two years' tenure of the headship of the department he personally superintended and saw through the press sixteen volumes of the "Catalogue of Greek Coins," one of Roman, one of Anglo-Saxon and seventeen of the Oriental catalogues (Arabic, Persian, Indian and Chinese), a total of thirty-five volumes, comprising minute descriptions of many thousands of rare coins, with scholarly introductions, elaborate indexes and a profusion of illustrations. The majority of these catalogues were, of course, compiled by members of his able staff, Dr. Head, Professor Percy Gardner, Mr. Keary, Mr. Grueber and Mr. Wroth, together with assistance from outside specialists such as the late Dr. Terrien de Lacouperie and Mr. Stanley Lane-Poole: but the Keeper himself was personally responsible for the first catalogue published under his régime, that of the "Greek Coins of Italy" (1873), for part of "Sicily" (1876), and he wrote the entire volumes on the coins of "The Ptolemaic Kings of Egypt" (1883), "Alexandria" (1892) and the "Shahs of Persia" (1887). Mr. Poole's conception of the responsibility of the Keeper was, however, excessively rigorous, and, as head of his department, he felt it his duty personally to compare the original coin with the corresponding description of it in the proof-sheets of every one of the thirty-five volumes published under his editorship. These services to science were recognised by the French Institut, which elected him a corresponding member in 1876; Cambridge gave him the honorary degree of LL.D., and he was honorary member of various learned societies.

The remarkable energy devoted to the medal-room did not, however, stifle the old love of ancient Egypt, which was refreshed by an archaeological mission to Cyprus and Alexandria in 1869-70. From time to time he wrote and lectured on Egyptology, and in 1882 he reprinted under the title of "Cities of Egypt" a brilliant series of papers contributed to the *Contemporary Review*. The book was appropriately dedicated to his mother, who had written "The Englishwoman in Egypt" nearly forty years before, and who spent her last years in her son's well-known house in the Museum quadrangle in an atmosphere of filial devotion. When Miss Amelia B. Edwards conceived the formation of the "Egypt Exploration Fund" she found a zealous colleague in Mr. Poole, who took a leading part in all the business of the Society, devoted his utmost energies to its success, and remained its honorary secretary to his death. When in 1885 he succeeded his old friend and colleague, Sir Charles Newton, in the Yates Professorship of Archæology at University College, he converted what had been a chair of purely Greek archæology into a means of general instruction in all the chief branches of antiquities, Oriental, Classical and Mediæval.

Mr. Poole's contributions to literature, besides the books already referred to, were few. He was not a ready writer, and preferred the lecture to the essay. Occasionally he contributed to the *Academy* or to the monthly magazines, and he wrote the articles "Egypt," "Hieroglyphics" and "Numismatics" for the "Encyclopædia Britannica." He also wrote an elaborate catalogue of the Swiss coins in the South Kensington Museum.

TESSERÆ.

Mortar.

IT was found by Berthier after an analysis that Roman cement is composed of carbonate lime 657, carbonate magnesia 005, carbonate iron 060, carbonate manganese 019, clay silica 180, clay alumina 066, water 013. Berthier considered that with one part of common plastic clay, and two and a half of chalk by weight, a very good hydraulic lime could be made, which would set as speedily as the English one; but it is not probable, he allows, that we can obtain by mixtures hydraulic lime which will acquire as great hardness and solidity as the natural mortar, because these qualities depend not only on the composition but also on the state of compactness. The greater density the material possesses, and if it slake without changing its volume, the greater facility will its particles have in becoming aggregated, and the less shrinking will there be during its consolidation. Berthier drew the following conclusions from a numerous set of ex-

periments. A limestone which contains 6 per cent. of clay affords a lime already perceptibly hydraulic. When the lime amounts to from 15 to 20 per cent. it is very hydraulic, and when from 25 to 30, it sets almost instantly, and may therefore be considered as Roman cement. He conceives that the iron and manganese have no effect whatever in occasioning the hardening. In a mortar which owes its solidity to the adhesion of the lime to the alloys, or substances with which it is mixed, there is evidently an advantage in multiplying as much as possible the surfaces of contact. Thus alloys with large grains do not afford mortar so solid as the pulverulent ones, because there are spaces filled with pure lime which do not present the same resistance to fracture as the other parts. On the contrary, alloys in powder, though they present the greatest surface, yet require a very large proportion of lime. To obtain then, with the smallest possible quantity of lime, mortars possessing the greatest solidity, alloys must be used containing particles of different sizes, avoiding always the mixture of argillaceous substances which form a paste with water, but have no coherence. These opinions have been put to the test of experiment on a large scale, the sand usually employed in Paris affording a better mortar when merely washed than when the fine particles are removed by a sieve.

The Founder of St. Bartholomew's.

The first Joculator Regis of whom we have any account is Rahere, who was not only a royal buffoon, but the founder of St. Bartholomew's Hospital and Priory. Dugdale gives an excellent account of the circumstances that led to this merry gentleman's conversion, and induced him after playing the fool for many years to please the court, to play it once more for the benefit of religion and humanity, and finally to become prior of the house he had himself founded. Rahere having spent his youth at court or in the houses of the nobility, to whom his wit and sprightliness rendered him peculiarly attractive, began to repent him of the follies and vanities of the course he had hitherto pursued, and to expiate his crimes, resolved to take a journey to Rome. He did so and fancied all was going on well, when unfortunately he fell sick, and fearing lest he should die in his Holiness's domain, vowed a vow to build a hospital for the poor if he might but recover, and once again reach England. Rahere got better and made good haste to get home. Upon his arrival in England the first thing he did was to consult with his friends how he should commence so important an undertaking, and from them he learned that the site belonged to no less a person than King Henry I. Nothing dismayed, Rahere petitioned his royal master for a grant of the site, which request, backed as it was by the interest of the Bishop of London, was not denied to an old favourite, and he obtained a free grant of the ground and the king's license to build a hospital, church and priory upon it. Rahere's next care was how to clear the ground and procure the proper materials for his buildings at the least trouble and expense, and here tradition relates that he had recourse to his old trade, and effected that by a stratagem which it would have drained his purse dry to have attempted in the usual mode. He feigned himself to be a merry idiot, and collecting a vast rabble about him by his antics and buffoonery, and setting them the example which they as readily followed, he cleared away the rubbish and brought in its room stones and all other the proper materials for his purpose. Having accomplished his design he discovered who he was, set about building the hospital and afterwards the church and priory, all which he finished in 1123 and dedicated to St. Bartholomew. In his priory he placed certain canons regular of the order of St. Augustin and constituted himself the first prior, and presided over his own foundation for two-and-twenty years. In 1133, Henry granted him the privilege of a fair to be kept yearly for three days, the eve, the day and the morrow of St. Bartholomew. The original intention of this fair was for the sale of English cloths, all the clothiers of England and drapers of London having booths and standings in the churchyard, the strangers being licensed for the three days, "the free men so long as they would, which was six or seven days," and this was the origin of the far-famed Bartholomew fair. After continuing superior of his own house till a good old age rendered him fit to be gathered to his fathers, he died in his priory and was buried in the church he had himself erected, where a splendid monument was erected to his memory with the following inscription:—"Hic jacet Raherus primus Canonicus, et primus Prior istius Ecclesie."

The Curfew.

Although there is no evidence to show that the *Couvre-feu* law originated with the Norman Conqueror, yet it appears certain that in 1068 he ordained that all people should put out their fires and lights at the eight o'clock bell and go to bed. But that it was not intended as a badge of infamy is evident from the fact that the law was of equal obligation upon the foreign nobles of the court as upon the native-born Saxon serfs. And yet we find the name of Curfew law employed as a by-

word denoting the most odious tyranny, and historians, poets and lawyers speaking of it as the acme of despotism levelled alone at the vanquished English. However well-intentioned the *Couvre-feu* law may have been, it appears to have met with much opposition, as in 1103 we find Henry I. repealing the enactment of his father. Blackstone says that though it is mentioned a century afterwards, it is rather spoken of as a time of night than as a still subsisting custom. Although the *Couvre-feu* law was abrogated by Henry I. yet the custom of ringing the bell at eight o'clock long continued. In the second mayoralty of Sir Henry Colet, Knt., 1495, this solemn charge was given to the Quest of Wardmote in every ward:—"Also yf there be anye paryshe clerk that ryngeth curfew after the curfew be ronge at Bowe Chyrche or Saint Brydes Chyrche, or Saint Gyles without Cripelget, all suche to be presented." At Ripon, in Yorkshire, a man sounded a horn at the market cross and at the mayor's door at nine o'clock every evening, a custom probably connected with ringing the curfew, which was not always done at eight o'clock. The sexton in the play of "The Merry Devil of Edmonton" (1631) says:—"Well, 'tis nine a'clocke, 'tis time to ring curfew." It is probable in the Middle Ages some superstitious regard was paid to the ringing of the *Couvre-feu*, for we find that land was occasionally left to pay for the ringing of the *Couvre-feu* bell. This feeling appears not to have been altogether extinct even so late as the close of the sixteenth century.

Decay of Buildings.

Those who have for any considerable course of years been in the habit of revisiting any particular ruin can scarcely fail to have observed how sensibly and how surely the course of decay, disintegration and downfall has progressed, even where there has been no deliberate mutilation. In many of the best preserved ruins we find the surfaces of the mouldings and carving covered with an ever-fresh pulverulence. If you visit a building in this exposed condition after a hard winter you are sure to find fresh spots where the details have fallen off through the recent frost, and in every ruin there occur from time to time slips and downfalls of greater or less importance, showing that, long as they have resisted the assaults of time and weather, there are limits to their duration, and that those limits are by no means distant. How many of our ruined buildings have lost large portions within the memory of man. Indeed such downfalls, if their statistics could be collected, would be found to reach an alarming number and amount, while the silent and yet more fatal progress of decay is every day and every hour eating into the most beautiful and most precious architectural details. And how could it be otherwise, when walls constructed of small stone and rubble-work are exposed, with no protection but ivy and wall-plants, to the constant action of the most destructive of climates, when every shower penetrates the crumbling mass and every frost has its full swing in its disintegration, and even the more solid stone, from being kept in a constant state of saturation with water, has every cause of destruction in full and continued operation upon it, and all this for centuries together? Nor have these been the sole agents of destruction. Many—indeed the great majority—of our noblest abbey churches, and even some cathedrals, have been taken down for the value of their materials, and those which were left as ruins were for the most part spared more because there was no market for their material than for any care for their preservation, and it naturally follows that they would become the quarries which would supply all the petty buildings around them. Perhaps the most remarkable case of this is at Reading, where the walls of the abbey have been stripped of their ashlar, both without and within, and the rubble core only left. This has been continued in many instances up to our own day, and even now it is occasionally found in a certain degree to hold good, as at Easby Abbey, in Yorkshire, where the lower part of the buttresses appear to have been comparatively recently pulled down, as being the parts most easily got at, while the upper stages, being out of reach, are left unsupported and dragging over the walls which they were built to stay. For the most part, however, it is neglect and the want of timely care which we have now most to complain of. The proprietors of these melancholy yet glorious remains, though valuing and caring for them as picturesque ruins, frequently seem to forget their value as works of art and to prefer risking their falling to pieces bit by bit to the trifling interference with their picturesque effect which would be incurred by a little timely reparation.

Ethiopian Remains.

Edifices of Egyptian construction or their remains are found along the Nile as far up as Jebel el Birkel, their ages being generally from 1700 to 1400 B.C. The Ethiopian structures, intermingled with or covering them, are of much more recent date (where date is assignable); and the best of them, erected by the Ethiopian kings who ruled Egypt from 719 to 675 B.C. appear to owe their architectural merits to Egyptian skill. Higher up the river the palaces or temples of Beit Naga, Jebel

Calefaat, &c., appear to be of still more recent origin—exhibiting corruptions of the Græco-Egyptian style. The pyramids of Ethiopia are quite modern in comparison with those of Egypt, as their form and mode of construction at once evince. The sculptures with which they as well as the temples are adorned are always inferior to those of Egypt and in general execrably bad. Yet in their style, which differs from that of Egyptian sculpture, they bear to one another that degree of resemblance which characterises one school of art; so that it cannot be admitted that the art of sculpture, as preserved on some of the monuments of Ethiopia, descended the Nile, and reaching its perfection in Egypt, returned after some thousands of years to reassume its old character in Meroe. The hieroglyphics of the Ethiopian monuments are still worse than their sculpture: they are ill cut, ill grouped, and sometimes, through ignorance, inverted or otherwise misplaced. A mistake of this kind may be observed in the signet of Osertasen I., of Egypt, borrowed by an Ethiopian king in an inscription at Jebel Calefaat. Of the origin and rise of hieroglyphic writing in Egypt, no traces can be found, the oldest discovered monuments exhibiting the art already in perfection. The pyramids of Meroe or Assur are considered by Ruppell to be more recent than those of Jebel el Birkel, and were probably erected between 400 B.C. and 400 A.D.

Appreciation of Architecture.

The faculty of appreciation of architectural art has not yet been fully arrived at. It is a faculty which must be cultivated, and it is far more difficult in architecture than it is in painting and sculpture, because, as respects the direct imitation of the works of nature, the three arts of architecture, sculpture and painting have very different powers. Architecture is the least imitative, sculpture is more so, but painting the most imitative of all; and the more imitative an art is, the more easy and the more general will be the appreciation of it, inasmuch as less cultivation of mind is needful for a recognition of the excellences contained in fine transcripts of nature than of the excellences contained in works founded upon conventional forms. Architecture being composed of forms which, though educed from nature, have been adapted to the necessities of building, it is evident that some degree of special education is needful for even a moderate appreciation of its beauties. We have constant evidence of the difficulties of appreciation even among the practitioners of architecture, and largely also amongst amateurs; and thus, for instance, the subject of styles has met with very rough treatment, and even a new style has been proclaimed as the pressing want of the day, which is as much as saying that a new language is necessary to enable modern Europeans to produce noble works of literature. "Style" seems to have been a great curse with many, yet every genuine variety of style demands admiration, inasmuch as no work possesses the quality of style until it has arrived at the condition of beauty. There may be better styles than others, and styles that are more suited for one purpose than another, also styles of greater purity and styles of greater exaltation than others. These, then, all these will be received by the genuine lover of art with feelings of appreciation; and here it must be admitted that the faculty of appreciation is not always as strong in the practical artist as in the amateur or the critic, and perhaps this arises from the wider range taken over the domain of art by the two latter than by the artist, who is sometimes absorbed in his own peculiar walk, and has neither the leisure nor the inclination to study with equal favour the numerous branches into which art is divided. Appreciation is itself an art, and it is honest, discriminating, generous, full of love, full of faith, seeking for excellences rather than defects. Many instances of the want of it have, however, occurred, such as when a really good building has been put into the hands of an architect to alter, he has disregarded the excellences of the older building, and has engrafted upon it his own mode and method with an apparent carelessness about the style and beauty of the original.

The First Antiquarian Society in England.

We first read of an antiquarian society being founded by Archbishop Parker in the year 1570. About twenty of the members were accustomed to assemble from time to time in the house of Sir Robert Cotton. In 1589 the society petitioned Queen Elizabeth for a building and a charter, but with what success we know not. The reputation of the society, however, gradually increased, until it excited the fears of James I., who, alarmed lest it should discuss public transactions, dissolved it. At the commencement of the eighteenth century it again revived, and grew into such importance that in 1751 the members obtained a charter of incorporation, the power to constitute statutes and to act under a common seal. The original object of their inquiries appears to have been British antiquities and history, although the enlarged operations of the society now embrace every subject of ancient and Mediæval relics and traditions. From the cultivation and extension of this antiquarian taste has sprung our modern institutions of similar tendencies.

NOTES AND COMMENTS.

THE sub-committee of the Glasgow Corporation entrusted with the charge of the galleries and museums have acted wisely in giving 525*l.* for the *Vanity Fair* of Mr. J. E. CHRISTIE. For the majority of frequenters of galleries modern works alone are attractive; the "old masters" are beyond their comprehension. It is easy to pretend that one possesses the faculty for appreciating the charms of dull landscapes, gaunt figures, mythologies, but it is not right to encourage that sort of hypocrisy. All artists have to think about the wants of their contemporaries, and those of Italians and Dutchmen differ from the wants of our time. At present there are far too many works in the Glasgow galleries which cannot be understood by the people, and it is to be hoped that in the new galleries a more satisfactory proportion of modern works will be visible. Mr. CHRISTIE'S *Vanity Fair* is of the kind that is suitable. He always succeeds in compelling attention to be given to his works. He has the gift of imagination, although no realist works harder to attain truth, and his colour is generally satisfactory. Why Mr. CHRISTIE has not attained a more prominent position probably could be explained by the picture dealers. But the citizens of Glasgow may be assured the money laid out on the *Vanity Fair* was well invested, for the picture will give far more pleasure than any of the ancient masterpieces which would be obtainable for the same money.

THE Classic temple at Nîmes known as the Maison Carrée is one of the most interesting of Roman buildings, and France may well be proud of such a possession. It will soon become still more precious in the eyes of architects. Professor GOODYEAR, who of late has been exercising a very keen American intellect in an independent study of ancient buildings, asserts that, as in the Parthenon, extremely subtle curves are to be found in the Maison Carrée in parts which are generally supposed to be planes. He maintains that all curves in architectural surfaces, whether concave or convex to the point of vision, produce an effect of dimension conditioned by the laws of curvilinear perspective, and that the curves of the Maison Carrée have been hitherto overlooked for this reason. Professor GOODYEAR has taken the precaution to have the measurements proving the curves to exist in the masonry constructed attested by the official architect of the city of Nîmes, with whose co-operation and assistance the measurements were made. The curves differ from those of the Parthenon, being curves in plan (not in elevation), and are convex to the point of vision. The measurements also indicate a perspective scheme in the intercolumnar spacings. Hitherto it was not supposed that the Roman mind cared for subtleties of the kind, and it is believed the Maison Carrée is the first building of the style in which they have been discovered.

WE have seen some samples of the plates from the important work "London Churches of the Seventeenth and Eighteenth Centuries," which Mr. B. T. BATSFORD is preparing for publication. As illustrations of buildings they will sustain comparison with those in the volumes on English Renaissance issued by the same publisher, and higher praise could hardly be given. It is a trait in our national character to undervalue many things which we possess, and hence fine buildings, which, if found abroad, would receive unstinted admiration, have been neglected. The new work will crown the reaction which began some years ago, for it will demonstrate that many of our London churches are not only effective as buildings, but that their details will sustain a microscopic scrutiny. If, for instance, the organ case of St. Lawrence Jewry were found in Vienna, every inch of the carving would be copied by artists from all parts of the world. WREN was anxious to have some means of obtaining copies of the work in the Paris churches, but we cannot recall one which shows finer Renaissance detail than is shown in the plate of the south choir aisle of St. Paul's. It is proposed to illustrate at least thirty-six of the churches by the aid of photography, for in no other way could justice be done to them; but ground-plans and drawings of parts will also be furnished. The whole work will be produced

under the editorship of Mr. G. H. BIRCH, who may be said to have devoted his life to the study of the architecture of London, and he is therefore pre-eminently qualified for the task. The price to subscribers will be three guineas, which is at the rate of a shilling a plate, and for that price only smaller, inferior, and less useful photographs are at present to be obtained. Considering its beauty and technical value, the new work will be a marvel of cheapness.

It is a pity that Englishmen are holding aloof from all archæological enterprises in Greece, with the exception of a little pottering which may help to entertain a few ladies and officials. Allow the Germans any sort of introduction, and they turn it to account most effectively. The latest example is Professor DURM, who was summoned to give advice about the condition of the Parthenon. Having accomplished the first part of his work he immediately utilised his opportunities to do something else which has been long neglected. He proposes to arrest the further decay of the Lion of Chaeroneia, of which the existence is unknown to most English travellers. Professor DURM has no wish to restore the figure, which at one time was so expressive of action, but he believes fragments could be obtained which would make the body less imperfect, while many pieces of the pedestal could also be gathered and put together in the same way, and again made to sustain the lion. If he succeeds he will have gained another triumph for German archæology, for although many years have elapsed since the body of the lion was exhumed, a really earnest effort to explore the ground for fragments was never accomplished.

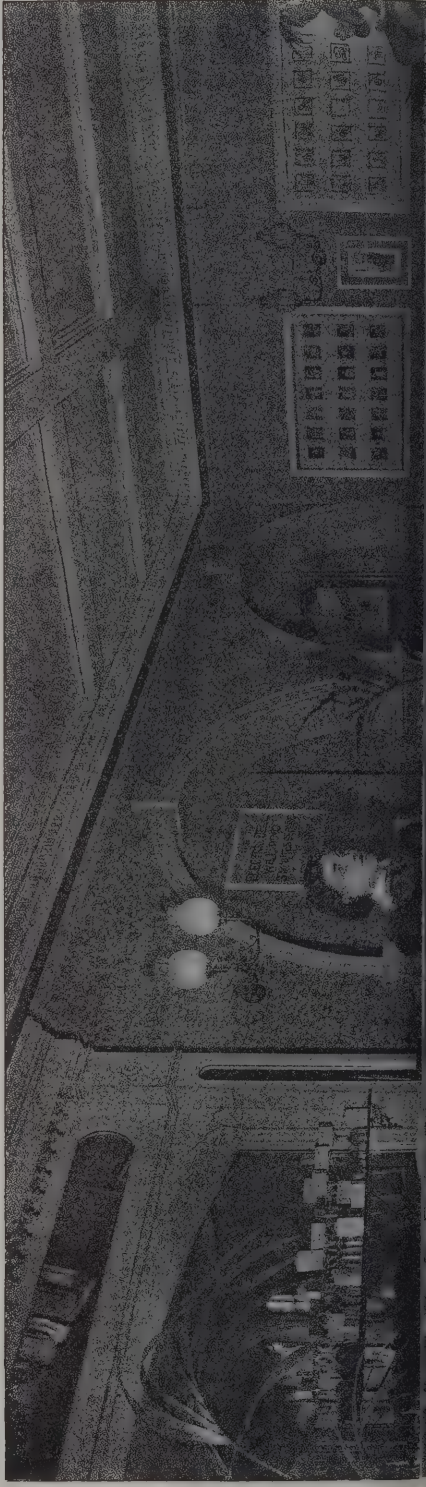
AT a time when the question of simple or compound Portland cement is under discussion, as well as the relative merits of English and foreign, the appearance of Mr. REDGRAVE'S "Calcareous Cements" (CHARLES GRIFFIN & Co., Limited) is most opportune. The subject is considered from many points of view, and the information has the precision which is desired by the practical man. The processes of manufacture, English and foreign, are described, and architects and engineers are informed about the tests which should be employed and the specifications to be adopted. The chapter on the employment of slags for cement-making will probably first receive attention, and we may say that Mr. REDGRAVE is in favour of combinations which are undervalued because they have received the evil name "adulterated." The success of mixed cement does not uphold the accuracy of the ordinary theory of cement, but it does not follow that the tests are incorrect. Mr. REDGRAVE recognises the difficulties, and on that as on other accounts, his pages are worth study.

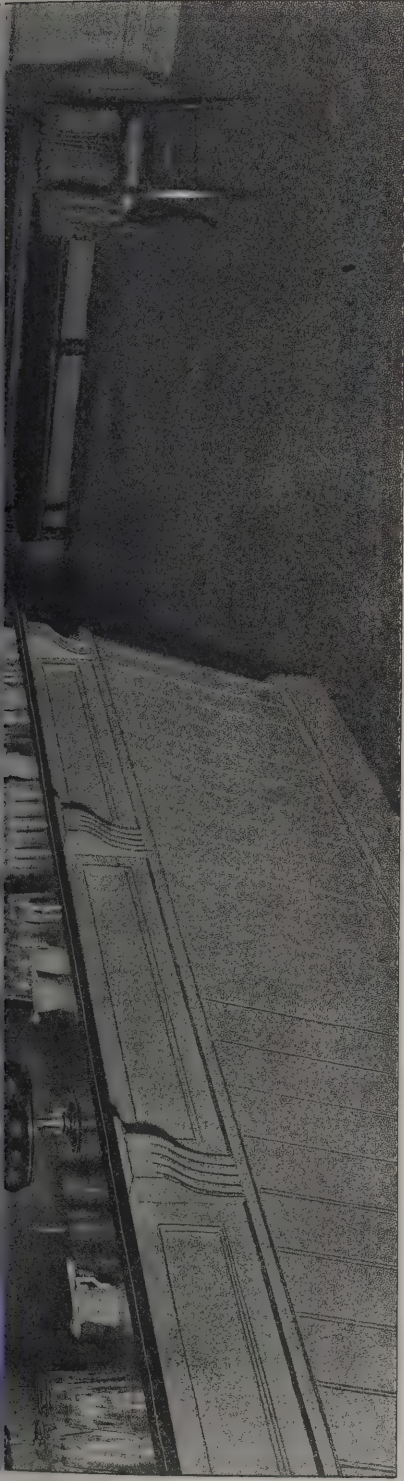
THE edition of the London Building Act by Messrs. W. RUSSELL GRIFFITHS, LL.B., and F. W. PEMBER, M.A., published by W. CLOWES & SON, Limited, forms a thicker volume than the various editions which appeared before it. The difference is owing in the first place to the number and length of the notes, which have been prepared with much care and refer to a great variety of cases. The treatment of the other statutes, of which parts at least are still in force, is no less systematic. The City of London Sewers Acts are also given, as well as the by-laws and regulations which are in force within the City. The printing is of a kind that will diminish the labour of consultation, and it is an advantage to have ample margins for recording memoranda. The editors do not claim for their volume that it is absolutely exhaustive, but for architects and builders it deserves to be considered as coming as near to that standard as will be ever needed. It is well worth the publishers' price.

LOCKWOOD'S "Price Book for 1895" is not only thoroughly revised and brought up to date, but in some sections has been scrutinised by experts. The new Building Act has been printed as a supplement, in full, with notes and explanations by Mr. DAVID, LL.M. Quality and quantity are, therefore, combined at the cheapest rate for the advantage of Messrs. CROSBY LOCKWOOD & SON'S numerous patrons in the building trade.



SALOON BAR.



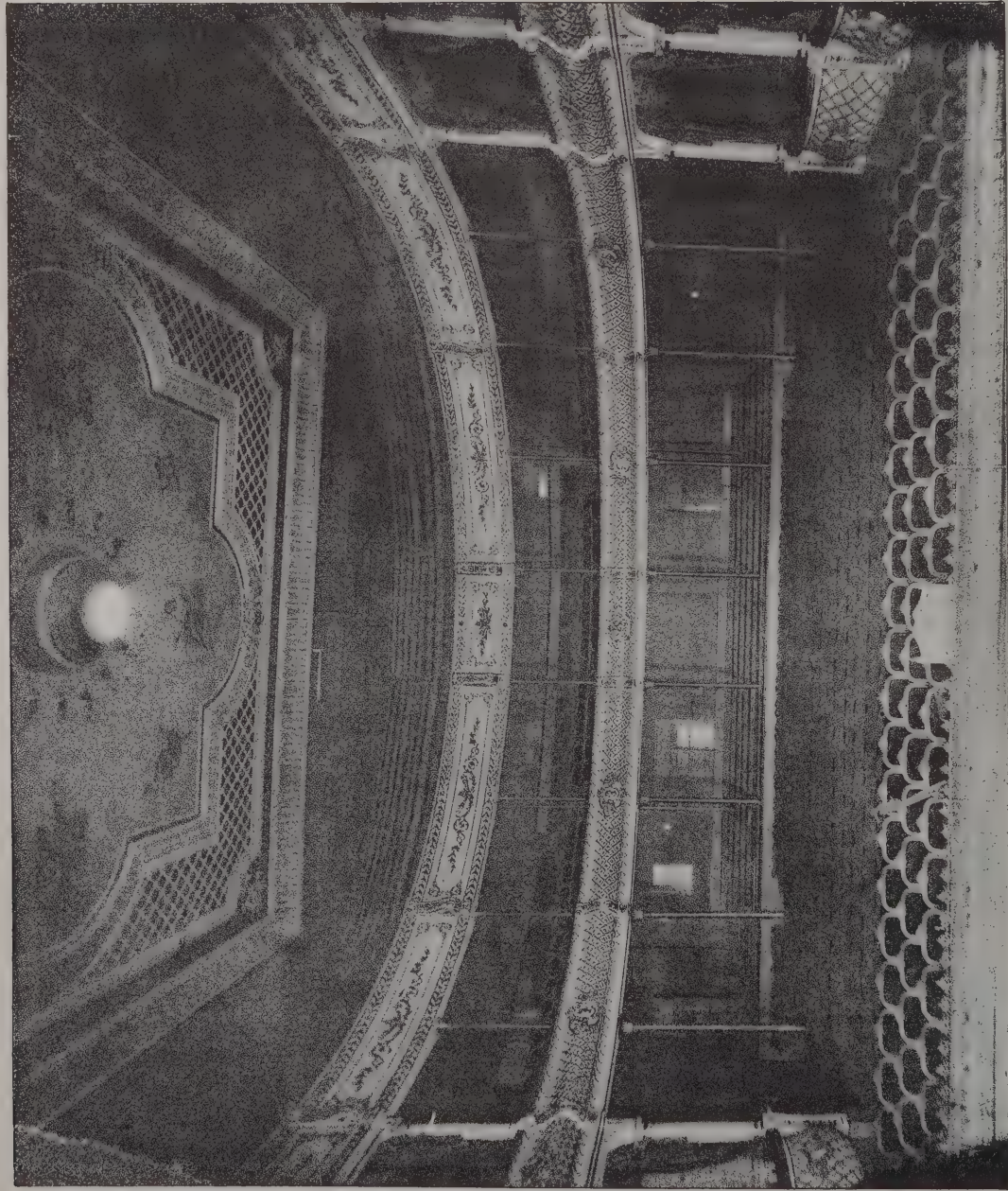


GRAND CIRCLE TEMPERANCE BAR.

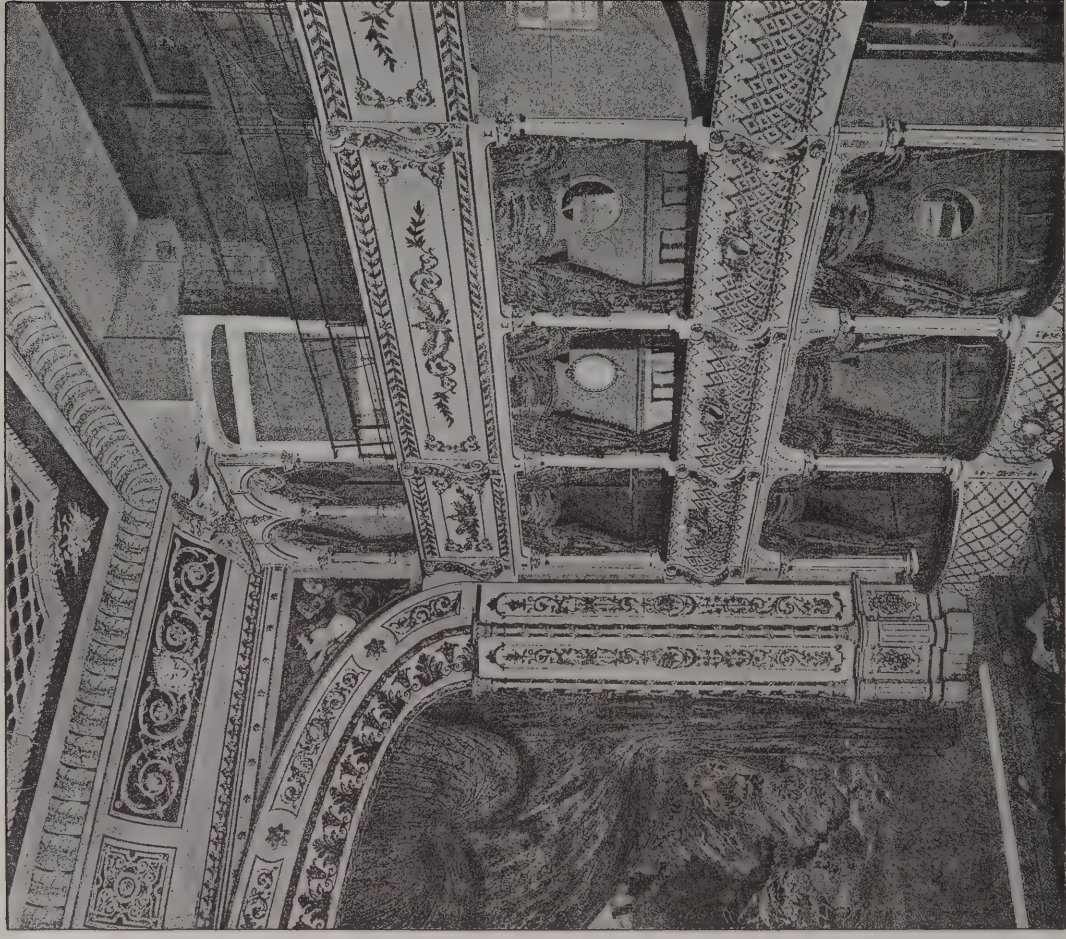


PIT BAR.

PAVILION THEATRE, MILE END, E.
ERNEST RÜNTZ, Architect.



THE AUDITORIUM.



VIEW OF BOXES.





VIEW OF PROSCENIUM.

PAVILION THEATRE, MILE END, E.
ERNEST RÜNTZ, Architect.

INK-PHOTO, SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

The Architect, Feb. 15th 1895.



TERRA-COTTA FIGURE OF "TRAGEDY" ON FAÇADE, by W. J. NEATBY.
PAVILION THEATRE, MILE END, E.
ERNEST RÜNTZ, Architect.

The Architect, Feb. 15th 1895.



INK PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

TERRA-COTTA FIGURE OF "COMEDY" ON FAÇADE, by W. J. NEATBY.

PAVILION THEATRE, MILE END, E.

ERNEST RÜNTZ, Architect.

The Architect, Feb. 15th 1895.





INK-PHOTO, SPRAQUE & CO 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

FRONT ELEVATION.
PAVILION THEATRE, MILE END, E.
ERNEST RÜNTZ, Architect.

ILLUSTRATIONS.

PAVILION THEATRE, MILE END, E.

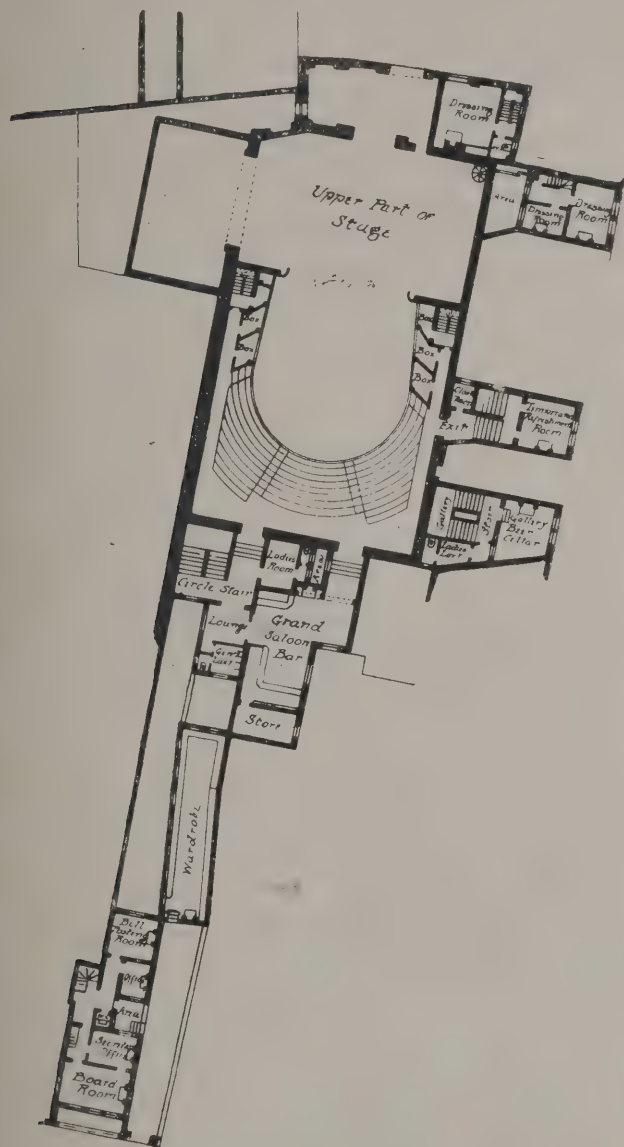
TERRA-COTTA FIGURES OF TRAGEDY AND COMEDY.

THE AUDITORIUM.—VIEW OF BOXES.—VIEW OF PROSCENIUM.

REFRESHMENT BARS.

ON Tuesday, December 18 last, this theatre, having been closed for three months and reconstructed in that time, opened its doors to the public.

The first theatre on the present site was erected in the year 1827. It was burned down on February 13, 1856, and reopened on November 30, 1858, under the title of the "New Royal Pavilion Theatre, or the Great Nautical



PAVILION THEATRE—FIRST FLOOR.

Theatre of the Metropolis," having been rebuilt by the late Mrs. DONALD MUNRO in the interim.

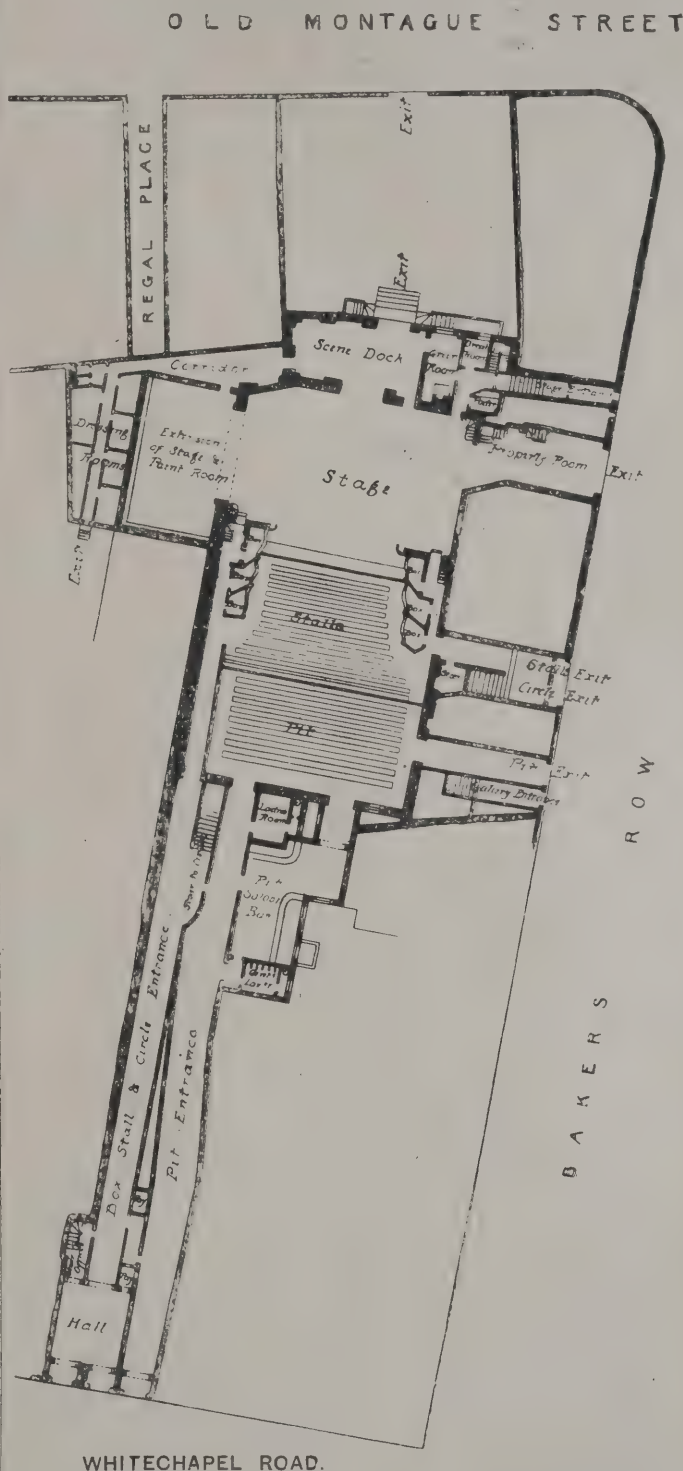
Practically the main walls are the only portion of the theatre of 1858 left standing, and even they have been considerably extended.

The task of altering and adding to the property was commenced in August last, but it was not until September 21, when the theatre was closed, that the very extensive alterations were seriously started. Within one week of this date the work of demolition was almost complete, and it is difficult to realise that in so short a period so much has been accomplished.

The one approach from the main road (always a drawback to this theatre, by reason of the intermixing of pit, boxes and stalls) has been entirely remodelled, and is appropriated to the stalls, boxes and grand circle only, and

for the pit a large area of ground has been acquired and a new approach erected adjoining the principal entrance.

The main entrance in Whitechapel Road has been entirely reconstructed; the design is Renaissance of simple yet bold outline. It is built entirely of terra-cotta, manufactured by Messrs. DOULTON. The three approaches are separated by Doric pilasters and piers surmounted by an entablature of the same order with a balustrade over. From the end piers rise coupled Corinthian pilasters surmounted



PAVILION THEATRE—GROUND FLOOR.

by a semicircular arch 16 feet in diameter. Somewhat recessed on the first floor is the Board-room, above which is a circular opening for illuminated advertisements and notices of the entertainments taking place. The space surrounding this circular opening is occupied by figures of Tragedy and Comedy, with Cupids and drapery above. The whole of these have been modelled by Mr. WILLIAM NEATBY, who has appreciated his subject and carried out the work in a masterly manner.

Those who remember the old refreshment bars (now entirely absorbed by the approaches) will appreciate the improvements in this department. In place of the cramped accommodation, spacious and cheerful saloons have been arranged on the site of adjoining property. Teetotal bars, with fruit and confection rooms for ladies and children, in addition to the ordinary buffets, are provided. The whole of the bar fittings have been specially prepared by Messrs. FARROW & JACKSON.

The auditorium has been considerably altered, the old ceiling removed and a new one erected at a greater height, thereby giving an uninterrupted view from the gallery. This ceiling, a special feature in the building, is designed in the style of the French Renaissance, the centre portion being clouded and richly painted by Messrs. NEPPER-SCHMIDT & HERMANN with allegorical figures and cupids; the boxes, too, have been transformed and enriched with classic columns, &c., the circle and box fronts have also been improved. The level of the pit and stalls has been altered, and the house generally has lost its former dwarfed appearance, and is now lofty, well ventilated and of good proportion.

The whole of the auditorium has been redecorated, re-seated and reupholstered, the latter portion of the work being entrusted to the well-known firm of A. R. DEAN, of Bull Street, Birmingham.

The general scheme of decoration is in modified primary tints, viz. terra-cotta walls of "Muraline," with Axminster carpets to correspond, old gold and electric blue upholstery, and the circles treated in blues, creams and gold.

A handsome plush tableau curtain now replaces the old green cloth, and an act drop of the latest East End improvement, to wit, the "Tower Bridge," has been painted by that popular scenic artist, Mr. J. HARKER, of Lyceum and Haymarket fame.

Probably the most extensive alterations have been made on the stage. Here the old roof has been removed, the building carried 32 feet higher, and a huge mansard formed, having a total span of 64 feet. On the west side the stage has been extended and a painting room provided; beyond this is a suite of cosy dressing-rooms, with every appliance for the comfort and convenience of the artistes. At the back of the stage the dressing-rooms have been entirely reconstructed with fireproof floors and partitions. On the stage level are the hall, green-room and quick change room, whilst in the basement a room for the orchestra is provided, with music store, &c., and emergency exit. Here, too, is the chamber for the electric installation by Messrs. MOODY BROTHERS, of 66 Victoria Street, Westminster, replacing the old limelight apparatus.

A new stage has been laid, with all modern improvements, by the company's stage machinist, Mr. J. WICKS; iron circular staircases replace old wooden ones, and in fact all stage appliances have been completely modernised at great cost, thus enabling the company to place before the public productions hitherto impracticable at this theatre.

Gas is still adhered to, except for the stage, as before mentioned, the auditorium being lighted by incandescent gas-burners, which have been supplied by the Incandescent Gas Company, of Westminster. There is a complete set of hydrants in the building, supplied by MERRYWEATHER & Co., of Greenwich.

The company have endeavoured to bring this theatre thoroughly up to date, feeling that in doing so and giving good value for money, the success of this old-established property will not only be maintained thereby but largely increased.

The company desire to acknowledge and thank the contractors, Messrs. COLLS & SONS, of 5 Coleman Street, E.C., for the very excellent and expeditious manner in which they have carried out the whole of the exceedingly heavy and responsible structural alterations and decorative work.

To Mr. T. J. COLLINS, of Messrs. COLLS & SONS, who had the management of the works, and to Mr. JARVIS, their foreman, great praise is due for their indefatigable efforts and organisation, and also to Mr. G. McLEAN FORD, A.R.I.B.A., who acted as clerk of the works throughout.

The whole of the structural and decorative work has been carried out from the designs and drawings and under the personal superintendence of Mr. ERNEST RUNTZ

architect (of the firm of Messrs. S. WALKER & RUNTZ), 22 Moorgate Street, London, E.C.

The mosaics are by the Vitreous Mosaic Co. The photographs from which the illustrations are taken are by the WILTONS, Limited, with the exception of the front, which is by Mr. A. BINNIE.

We understand that Mr. ERNEST RÜNTZ is well forward with his designs for the new Theatre Royal at Cambridge, which is about to be built for Mr. W. B. REDFERN, J.P., D.L. of Cambridge. Building operations will commence at the end of April or early in May. We shall publish the views of the Cambridge Theatre in due course.

The whole of the Mansfield Woodhouse stone used in the New Municipal Buildings at Burton-on-Trent, given by Lord Burton, and illustrated in last week's *Architect*, was supplied from the Pleasley Junction Quarries, Mansfield Woodhouse. These quarries have only been open a few years, and the finest quality stone is obtained from them. Mr. William Sills, Mansfield Stone Quarries, Nottinghamshire, is proprietor.

SOCIETY OF ARCHITECTS.

A MEETING of this Society took place on Tuesday, the 15th inst., Mr. Hamilton in the chair. The Rev. J. Cave-Browne, M.A., read the following paper on

The Parish Church of Maidstone: Its Architecture and Archæology.

The Rev. CAVE-BROWNE said:—Before entering on a detailed examination of the church itself, it may be interesting to see what can be gathered from early writers and from recent discoveries as to the existence of any previous building on this site. Without reviving the old controversy as to the original name of Maidstone, whether or not it was the Vagniacæ of Antonine, so called from the vagaries of the river on which it stands, or why it was called by the Saxons "Medwægestan," according to Camden, it is evident that it must once have been a Roman settlement, as most interesting discoveries in the neighbourhood show. From its position, lying in a nearly direct line between Richborough, or Dover, and London, it was most probably an important military station, and as such would have its curia or basilica and its templum. It may then be fairly inferred that here, as in so many other places, St. Paul's to wit and Westminster Abbey, the basilica or temple would be converted into a place of Christian worship, to be replaced in due time by some more strictly ecclesiastical building as Britain became Christianised.

The first actual mention of a church existing in Maidstone is to be found in the Domesday Record, where it is expressly stated in the survey of the manor (*Ibi Ecclesia*). The next reliable source of information, after an interval of 300 years, is in the Lambeth Registers, where it is recorded that in the later years of the thirteenth and the beginning of the fourteenth centuries Archbishops Winchelsey and Reynolds frequently held ordinations here, showing that even then Maidstone was an important ecclesiastical centre, and could boast a church capacious enough for so imposing a function.

Whether any portion of that building still remains is very doubtful. During the recent restoration under Mr. Pearson an interesting discovery of Mediæval tiles was made, lying *in statu quo* about a foot below the present floor level, which were probably of the early part of the fourteenth century. The designs were heraldic, of the current style of that period, *fleurs-de-lis*, lions rampant, chevrons, quatrefoils, &c., but seeming to give no clue to the probable founders of the building. At the same time it was discovered that the piers of the south aisle were built upon bases of a much ruder and more massive character, of oval form, and having a slightly more southward inclination, showing that the present one occupied, with very slight deviation, the site of an earlier church. Then a further discovery was made in the chancel under the choir stalls of a few tiles of much finer workmanship, representing a bishop and a king, each seated, which were pronounced by the Society of Antiquaries to be of a rather later date than the others, and probably designed for mural decoration. These also evidently belonged to the earlier building.

What, then, it may now be asked, is the probable date of the present church? A casual glance at it, with its broad-spaced windows, prolonged mullions, and scant mouldings, would no doubt suggest that it was, what local tradition pronounces it to be, the work of Maidstone's great Archbishop Courtenay, at the close of the fourteenth century, and as such a fine specimen of the Transition between the later Decorated and the Perpendicular, then coming into fashion.

But a closer examination would seem to point to an earlier

date. Take, for instance, the tower, which, as in so many churches in Kent, instead of being at the west end, stands out on the south side. Its bold buttresses, the roughness of the masonry and the two-light windows of the upper storey belong rather to the earlier than to the later years of the fourteenth century. Another feature of the tower is also noteworthy—a projecting turret on the inner angle, like that at Herne Church, anticipating, as it were, what came to be so frequent an arrangement in Kent during the Perpendicular period.

It may be here mentioned, before passing into the interior, that this tower, so massive and broad, from whatever point you look at it, except perhaps the river side, conveys the impression of being disproportionately low, having a stunted or dwarfed appearance. This may be explained by the fact that there originally arose a graceful spire, as is represented on the old municipal seal of the borough, which spire was struck by lightning and destroyed, never to be rebuilt, in the year 1730. Up to that time the spire-topped tower gave that elevation and dignity to the entire building which, unfortunately, it now lacks.

On entering the building, further evidence meets us of its earlier date than the Courtenay era. At the western end of the south aisle is an Early English doorway, which formerly gave access by a newel stair to the belfry in the tower. Then in the north wall near the east end is a similar doorway opening into a broad buttress, where a winding stair led up to the rood-loft. Again, at the eastern end of the south aisle are the remains, though sadly mutilated, of a richly decorated piscina, to which happily a definite date can be assigned, for the Lambeth Register tells us that in the year 1369 a license was granted to Robert de Vineter (or Vyntier, as he is sometimes called) to endow a chantry at the altar of St. Katherine, already existing, with lands on "Gould's estate," from whence this was known as "Vinter's" or Gould's chapel. Also in the clerestory windows are remains of decorated tracery. Are not these confirmatory indications that, despite the local tradition and current opinion which claim for Archbishop Courtenay the credit of having been the real builder (*fundator*) of the present church, what he really did was more likely the utilising the shell (so to say) of the then existing building, and inserting Perpendicular windows and substituting the light and graceful columns for the more substantial ones of the preceding period, and supplying a fitting endowment.

Then, again, the windows themselves, especially those on the north side, would seem to confirm this view. They are all of four lights and of the same width, while the spaces which they occupy between the buttresses vary considerably; several of them are so squeezed in that in some the corbels or returns of the hood-mouldings are buried behind the buttresses, while where they clear the buttress the masonry round gives indication of insertion, while the stonework in the upper portion of the walls differs in character from that of the lower part. Now had they formed a part of the wall as it was originally built, may it not be assumed that, rising with the wall, the windows and the spaces they were designed to fill would have been proportioned and adapted to each other?

Having dealt so far with the structural features of Archbishop Courtenay's work, we would pass on to consider the ecclesiastical and financial character of the changes he introduced. He found St. Mary's, as it then was, a rectory evidently very poorly endowed, and served by a rector and one or more curates, having the small churches of Detling and Loose (two villages about two and a half miles on either side of the town) attached to it as chapels-of-ease, dependent on the mother church for their ministrations. But on the other side of the river, a short distance off, he also found a well-endowed *hospitium*, or hospital, really a rest-house for pilgrims on their way from the west to the shrine of St. Thomas of Canterbury, having its chapel, refectory, dormitories, &c., with its staff of warden and fellows, or *corrodors*, for the purpose of supplying hospitality and ministering to the wayfarers. This had been the work of Archbishop Boniface in the middle of the thirteenth century, dedicated to SS. Peter and Paul, by which he hoped to condone an act of Savoyard cruelty he had perpetrated upon the prior of a small *hospitium* in Southwark which came under his patronage and jurisdiction. A passing word may here be spared for the chapel of this *hospitium*, all that now remains of it. It had been for years neglected, and eventually converted into a store-shed of a contiguous brewery, but was rescued and restored to its sacred use about sixty years ago under the present name of St. Peter's Church. The east end has been preserved. There may still be seen its beautiful deep-played lancet windows, with their graceful Purbeck marble shafts, one of the architectural gems of the town of Maidstone.

Now, in Archbishop Courtenay's time the enthusiasm for pilgrimages had become less eager, and so this hospital had begun to lose much of its original purpose, and was lying comparatively useless and idle, while it encouraged idleness in its members in these days of its decline, consisting chiefly of inferior dependents of preceding primates. Here Courtenay

saw his opportunity; as patron of both hospital and rectory it became easy for him, under the King's sanction, to transfer the revenues and advowsons of the one to the other, and thus to give greater efficiency to the ministrations of the church in the town. So he turned the rectory of St. Mary's into the collegiate church of All Saints, replacing the rector and his curates by a warden and six canons, with a full staff of subordinates, and erected for their accommodation the college close by, with its goodly range of buildings.

We must now pass into the interior of the church. The eye is at once struck with its spaciousness, the lightness and elegance of the pillars; the whole area, now divested of the heavy galleries which, until its recent restoration, blocked up the side aisles, displays a clear expanse, unrivalled by any church in the county. Its symbolical proportions, too, brought out with so much force and feeling by the present Archbishop on the occasion of its opening service after the restoration, demand a passing notice. The nave is just 99 feet long and 93 feet wide; the choir proper is composed of two squares of 60 feet each, making a depth of 120 feet by 60 feet wide; the two side aisles of the choir are of corresponding length with the choir itself, and each 12 feet wide. Here we have in each part and each way, in the nave, the choir and the chancel aisles, multiples of the figure 3. Can this be accidental? asks the Archbishop. Was it not designed to keep constantly before and impressed on the minds of the people the great cardinal doctrine of the Christian faith—that of the Triune God.

The interior arrangements of the church are sufficiently preserved to enable us to consider them in detail. Here were clearly five altars; the east ends of the side aisles of the nave and of the chancel were so appropriated, as well as the high altar. That dedicated to St. Mary, the patron saint of the original church, occupied the end of the north aisle, of which not a vestige remains, though on the angle on the outside corner is still to be seen a small canopied recess in which no doubt the image of the Virgin formerly stood; at the end of the south aisle was the altar of St. Catherine already alluded to, and here are the mutilated remains of a once beautiful piscina, hewn and chiselled away to make room for a staircase up to a gallery; the south aisle of the chancel contained the altar of St. Thomas, but here all trace of piscina and credence have been obliterated by ponderous modern monuments; then in the opposite chancel aisle stood the altar dedicated to the use of the "Corpus Christi Fraternity," who once held an important position in this town, their ancient home in Earl Street, used for many years after its suppression as a grammar school, now converted into a brewery store-shed and workshop.

In this chapel nothing remains but the step on which the altar stood. We have next to speak of the high altar at the east end of the choir itself; all that now survives to tell its tale is a very handsome and noteworthy four-seated sedilia, all on one level. The chancel arch was no doubt once spanned by a conspicuous rood-loft, to which access was apparently obtained through the turret stair in the north wall, and across the north aisle, where probably a smaller rood marked the entrance to the chapel of St. Mary. All indication of the central or side rood-loft has disappeared in the piers of the chancel arch and the north wall.

When we come to speak of the monuments it must be admitted that, taking into account the age and importance of the church, it is not so rich in them as might have been expected. The one which, had it escaped the ruthless hands of General Fairfax's Parliamentary troopers, would have been the glory and pride of the church is that which commemorates the noble-born and noble-minded West of England Primate Courtenay, whose affection for the place was evinced in the renovation and endowment of the church. On the pavement in the centre of the choir lies a massive slab of Bethersden marble, of unusual proportions, which once covered an altar tomb. On it may still be traced outlines of a matrix of a sumptuous brass representing the figure of the good archbishop in full pontificals, under a richly wrought canopy. This, despite the rival claims of Canterbury Cathedral to his burial-place under an unnamed and unadorned tomb, marks the spot where rest the bones of Courtenay, as was proved by a careful examination of the tomb by experts at the close of the last century, thus establishing the fact that the one at Canterbury ascribed to him is but a cenotaph, erected by the monks of the Christ Church Abbey to fabricate a spurious claim for their cathedral to have the honour of being the resting-place of so distinguished a Primate. This goodly slab has known many vicissitudes; once, as has been said, covering a handsome altar tomb, which was pronounced to be an obstruction, it was lowered to within a foot of the pavement, but being still an obstruction, and being moreover degraded to the use of a bench for the Sunday school children to sit upon, it was deemed, if not more dignified, at any rate less open to desecration, to lower it to the pavement, where it now lies.

Only second in interest to that of the second founder of the collegiate church is the altar tomb of its first warden, Thomas

Wotton. In accordance with the wish expressed in his will, he was buried in the chapel of St. Thomas, subsequently known as the "Arundel Chapel" from the fact of this elaborate tomb having been erected by Courtenay's successor in the see of Arundel over their mutual friend Wotton. It is as remarkable for the richness of its architectural details as for its heraldic adornments; perhaps still more for the singular fresco which covers the wall at the back, where, with St. Katherine and St. Thomas standing by, an angel is presenting the soul of Wotton before the Virgin Mary seated on her throne. This wall could not have been contemporary with the tomb itself, but was clearly an afterthought, introduced doubtless to serve as a background to the beautiful sedilia, which present the rare feature of being four in number and all on one level.

A third altar tomb once stood in the choir, but, like that of Courtenay, is now level with the pavement. Tradition has it that this was the burial-place of a member of the Woodville (or Widville) family who then owned the mote—either the grandfather or the father of Elizabeth Woodville, who became queen of Edward IV. The matrix on the stone is now so worn that no conception can be formed of its design, save that it represented two separate figures lying side by side. A rough outline sketch of it was made by the learned antiquary and unwise politician Sir Edward Dering, and was preserved among the (now apparently lost sight of) "Surrenden MSS.," of which, however, a copy was given in the first volume of the "Archæologia Cantiana."

From these monuments of the fourteenth and early fifteenth centuries we pass—with the exception of a singular copper plate on the wall of the chancel pier, which records no less than seven generations of the old Maidstone family of the Beales (and by its side one to the Tufton family, then owners of the mote), from whom the distinguished local antiquary Beale Poste claimed descent—to a group of monuments of a very different character, belonging essentially to the Tudor and Stuart periods, of the Astley and Knatchbull families. These originally stood in the chancel, to the sore obstruction of the sedilia, which had been chiselled away to make room for them, and blocking up the east wall of the church. But on the recent restoration of the church under Mr. Pearson they were moved away and arranged against the west wall, where they are less obtrusive and appear to far greater advantage. The first of this group is a colossal tomb of grey alabaster, rising some 20 feet from the floor, in two stages, commemorating two generations of the Astley family. In the upper one are the figures of John Astley, master of the royal jewels and plate under Elizabeth, with whom indeed he claimed kinship, as his mother's sister married Sir Thomas Boleyn and became the mother of the ill-fated Anne Boleyn, and by his side the figure of his wife. In the lower portion, again, are two figures, those of his son Sir John Astley, who was also a Court favourite, and was master of the revels under James I. and Charles I. By the side of this tomb is one of a very different character and to the memory of a very different man, who, as his cousin, succeeded to the property of Sir John. This was Sir Jacob Astley, whose memorable prayer, "O, Lord, if I forget Thee to-day do not Thou forget me," before going into the battle of Edgehill, has given him a place in English history. His monument consists of what is called a herse—a flat white marble slab, with his shield in the centre.

By the side of the group of Astley monuments is one of Knatchbulls of Merst Hatch, into which family a daughter of Elizabeth's John Astley had married. On this long flat monument appears a long Latin inscription recording the alliances of the sons and daughters of Sir Thomas Knatchbull, who married into some of the leading families of the county, a Curteis of Tenterden, a Toke of Godington, a Chute of Appledore, and others, the whole proclaimed on seven richly emblazoned shields which run along the frieze of the monument.

A vote of thanks was proposed by Mr. H. Lovegrove, A.R.I.B.A., seconded by Mr. Ellis Marsland, and supported by Messrs. H. G. Quartermain and Middleton.

EGYPTIAN CHRONOLOGY.

THE "Horæ Ægyptiacæ" of the late Reginald Stuart Poole is a work that is less known than it deserves. That so abstruse a subject was treated by a youth of seventeen is one of the most remarkable feats in the history of scholarship. Probably Mr. Poole may have had the advantage of manuscripts by his relative, Mr. E. W. Lane, who lived in Cairo. As a sample of the work we give what is practically the concluding chapter. It relates to the first nineteen dynasties, which seems best adapted for reading by those who are not specialists. The preceding parts afford a better notion of the author's learning:—

We have now to consider the most brilliant period of Egyptian history, the rule of the eighteenth and nineteenth dynasties, during which the kingdom rapidly rose in power, until the shepherds were wholly expelled and the nations of Asia and Africa, from the Tigris to Abyssinia, were reduced

to tributary states, under the control of the Pharaohs. A complete examination of Manetho's lists and the monumental history of these dynasties would fill a volume; and, therefore, I must confine myself chiefly to certain remarkable points upon which I conceive new light may be thrown.

The chronology of the eighteenth and nineteenth dynasties presents remarkable difficulties which the numerous monuments of the time do not enable us completely to clear up. These difficulties are chiefly occasioned by the repetitions of certain kings' names and reigns, from some errors in the lengths of kings' reigns, and from the reckoning of some contemporary kings as successive, in Manetho's lists. With respect to the chronology of these dynasties, in addition to the dates which I have before mentioned, all that can be said with certainty appears to me to be that the eighteenth dynasty commenced about B.C. 1570, at the commencement of the great Shepherd War, and that the nineteenth ended somewhat more than 300 years afterwards, about the middle of the thirteenth century B.C. These approximate dates agree with the two dates of the reigns of Amenoph II. and Rameses II., which I have previously pointed out.

Let us now examine more particularly some of the events recorded by Manetho and the monuments. Abstaining from entering upon the subject of the foreign wars of the Egyptians—a subject which would require much larger space than I can here devote to it—I shall only notice one fact relating to these wars, namely, the total silence of the Scriptures as to the expeditions of the Pharaohs. To ascertain the cause of this silence, we have in the first place to consider the nature of that part of the sacred records which relates the history of the Children of Israel during the interval in which the great conquests of the kings of the eighteenth and nineteenth dynasties were achieved. The Book of Judges, which contains the history of this period, narrates the servitudes of the Israelites, their deliverances, and the periods of prosperity following those deliverances. The durations of the servitudes and times of prosperity are given with scarcely any notice of remarkable events which happened during those periods; but the successful efforts of the Israelite leaders to free their country from foreign tyranny, and the circumstances of each deliverance, are much more fully narrated. Hence we can easily see that the Book of Judges, like the historical parts of the Pentateuch, is an account of God's dealings with His people, of the punishments which He inflicted on them for their sins, and the leaders whom He raised up to deliver them when they had repented. We may, therefore, readily believe that Egyptian armies passed through Palestine, and that their passages are not recorded in the Book of Judges, because they neither conquered the Israelites nor made them tributary. That they did not do so I consider almost certain, since I find no names of towns of the Israelites, nor names of the tribes, in the lists of towns and peoples and countries conquered or made tributary by the kings of the eighteenth or nineteenth dynasties, although we do find such names in the similar list of Sheshonk I., the Shishak of the Scriptures. Hence it appears highly probable that the Pharaohs of the eighteenth and nineteenth dynasties never attacked the Israelite possessions during the times of the Judges, and their reason for not doing so must have been that they well knew the calamities which their predecessors had brought upon themselves and upon all Egypt by their cruelties to the Israelites. The same may be said of the kings of the twentieth dynasty.

I have already mentioned that Thutmosis, or Thothmes IV., expelled the shepherds, and I have nothing now to add to what I have before said on this subject, except that the silence of the monuments as to this important event is easily to be explained. For we find that nothing which the Egyptians considered as not creditable to their valour is ever recorded on the monuments, and consequently we cannot expect to find on them an account of a transaction in which an Egyptian army of 480,000 men was unable to reduce a fortified place defended by a force of shepherds of about half their number.

The next remarkable event after the shepherd-exodus was the settlement of a foreign tribe of sun-worshippers in Egypt, and the subjugation of the whole country by them. This event seems to have been noticed by Manetho, for Eusebius, in the second part of his chronicle, mentions that during the reign of Amenophis (Amenoph III.), the seventh king of the eighteenth dynasty, "the Ethiopians, migrating from the river Indus, came and took up their habitation near to Egypt;" and Syncellus, in his "Laterculus," inserts the following sentence between Amenophis and Orus:—"The Ethiopians, coming from the river Indus, took up their habitation near to Egypt." Of course this statement would be of little value if resting solely on the authority of Syncellus; but when we find it also in the chronicle of Eusebius it becomes highly probable that it was originally derived from Manetho or some equally trustworthy authority; and the fact that Egypt and Ethiopia, the latter perhaps first, were some time under the power of foreign chiefs about the time mentioned by Eusebius, proves the genuineness of the statement.

The position of the eastern Ethiopians is easily fixed, from the accounts of Herodotus and others, whence we learn that they chiefly inhabited Gedrosia and Carmania, and it is probable that their territories did not extend further eastward than the river Indus. Herodotus, in his enumeration of the army of Xerxes, mentions them as a long-haired people, to distinguish them from the woolly-haired western Ethiopians who inhabited the countries watered by the Upper Nile. The Cuthites, or inhabitants of Cuthah, placed by the king of Assyria in the cities of the ten tribes, may be the same people (*vide* 2 Kings xvii. 24, 30).

The earliest indication of the presence of the sun-worshippers in Egypt is in the time of Amenoph III., in an inscription on a scarabæus, with the date of the eleventh year of his reign, in which their god, Atenra, or the solar disc, is distinctly mentioned (see Rosellini's "Monumenti Storici," plates, No. xlv. 2). This furnishes us with a strong reason for adopting Sir Gardner Wilkinson's conjecture that Amenoph III. belonged to that foreign race, and the fact that two (at least) of his sons held their religion renders this still more probable. After the death of Amenoph III. the foreign chiefs became very powerful, and succeeded in gaining possession of Egypt and Ethiopia, and holding those countries for some years. Their kings are found in Manetho's list, between Orus and Rameses, of the eighteenth dynasty, and since the former king destroyed their monuments they must be reckoned as before him; but they were after Amenophis, his predecessor, consequently they must be placed between these two kings, or reckoned as contemporary with one or both of them, but mostly with Orus, since his monuments are few, and thus indicate a reign much shorter than that assigned to him by Manetho, namely, thirty-six years and five months, or thirty-seven years. To class the kings of the sun-worshippers in their proper order is a work of great difficulty, though much has been done by Sir Gardner Wilkinson and M. Prisse towards effecting this desirable object.

The monuments erected by these foreigners must have been considerable; but few now remain, and these have suffered severely from the hatred which the Egyptians bore to this people. Their most remarkable records are to be found in the sculptures of the grottoes of the ancient town of Psinaula and in the sculptures on the hills near Ashmooneyn, the old Hermopolis Magna, and in some sculptures in Ethiopia. From these we obtain a general idea of their religion, which was a simple form of sun-worship. In their religious inscriptions we find the sun represented as a disc with numerous rays issuing from it, each terminating with a human hand, one of which presents to the worshipper the symbol of life. The names under which these people worshipped the sun are Aten-ra or the solar disc, that is the visible sun; Mui-ra, the brightness or rays of the sun; and Ra or Phra, the solar principle or power supposed to reside in the sun. It is well known that sun-worship was practised in ancient times by many powerful nations of Asia, by some of the Chaldeans, by the Medes, Persians and Bactrians, by the Massagetæ, a tribe of the Scythians, by the Phœnicians and by some of the Syrians. Among all these nations the sun appears to have been the principal object of worship, and among some of them the sole god. It is interesting to compare as much as we know concerning the religion of the sun-worshippers in Egypt with the Chaldean oracles of Zoroaster, as given by Cory in his "Ancient Fragments." Although generally of late origin, they certainly contain many of the principles of the old religion of Zoroaster. Thus, for example, we read:—

It becomes thee to hasten to the light and rays of the Father,
From whence was sent to thee a soul, endued with much mind.

A sentence which forms a curious comment on the worship of the foreigners in Egypt as represented upon their own monuments, and similar instances might be multiplied, but I shall only notice the regal character of the sun and another remarkable point. Zoroaster and his followers generally speak of one deity, though it is evident that they had a triad or triads, and in like manner, though the hieroglyphic inscriptions of the sun-worshippers uniformly represent but one object of adoration, yet in two instances mention is made of "the suns." Now, from the different names given to the god of the sun-worshippers, it is obvious that they adored one god whom they considered as resident in the sun and operating through its rays, and yet that they worshipped the principle through the medium of the sun and its vivifying rays. These evidently correspond to the fire, sun, or light and ether of the Zoroastrian triad, originating from a monad. The only one of these correspondences that appears at first sight strained is that of the third person of the Zoroastrian triad, ether, with the principle resident in the sun, but the objection is removed when we remember that the ether of Zoroaster corresponds to the soul or spirit of the universe, of several of the ancient philosophers, whose principles are well known. How interesting it is to see in the earliest monuments of Asiatic nations yet known the

first records of that religion which so widely prevailed in Asia for so many ages, and which is not yet extinct.

Precisely how and when the sun-worshippers were expelled from Egypt does not appear; though it cannot be doubted that Orus, the Har or Hor, of the monuments, was the king who overcame them, for it has been ascertained that he built a propylæum at Thebes from the materials of former edifices erected by the foreign kings, and this, joined to the fact of the very frequent erasure of their names by the Egyptians, even in private tombs, renders it most probable that their expulsion was effected by force.

After this time no very remarkable event appears to have happened until the accession of Sethee I., the Sethos or Sethosis of Manetho, and first king of the nineteenth dynasty. In the sculptures on the north wall of the great temple of El-Karnak, at Thebes, are several already supposed to refer to the expulsion of a shepherd-race from Egypt. From the inscriptions which accompany them, we learn that King Sethee expelled a race of shepherds "of the land of Shasu" from the city of the Lion, in the first year of his reign. It is not certain whether the city of the Lion is Leontopolis or Thmuis, for Thmuis has the same signification in Coptic as Leontopolis has in Greek. However, I think it more probable that it is Thmuis, because that town preserved the original name.

Manetho, in his relation of the events of the reign of Sethosis, as cited by Josephus, speaks of that king as Ægyptus and of his brother Armais as Danaus, and relates at some length the offences of Danaus and his usurpation. Herodotus, in a similar relation, confounds Sethee with Sesostris. It is obvious that the supposition that the flight of Danaus took place early in the reign of Sethee is repugnant to all the systems of Greek chronology derived from the statements of the Greek writers; but the fact of Manetho's putting forth that idea was probably occasioned by his concluding at once, from the similarity of the Egyptian account to the Greek traditions concerning Danaus, that Armais and Danaus must have been the same person as Herodotus had concluded before him.

It only remains to notice the account I have already mentioned of a great shepherd-invasion in the time of Menptah, or Menphthah, the son and successor of Rameses II. Josephus, who cites Manetho's account of this occurrence, expressly says that Manetho did not take it from his ancient records, but, "as he himself confesses, from certain fabulous compositions of uncertain authorship." This account is evidently a confused tradition of an invasion of the Shepherds during the times of the eighteenth or nineteenth dynasty, in which those foreigners, as coming from Jerusalem, are supposed to be the Jews. The tradition may be thus briefly stated. In the reign of Amenophis, the son of Rameses, and father of Sethos-Rameses, who is thus identified with Menptah, the son of Rameses II., and father of Sethee II., all unclean persons were sent out of the inhabited part of Egypt to work in the quarries; and on their complaining of the severity of such treatment, they were allowed to occupy the city of Avaris. Having thus obtained a place where they might easily revolt, they renounced their allegiance to Amenophis, chose a priest of Heliopolis as their leader, called in the Shepherds who had formerly possessed the country from Jerusalem, and with their assistance made war upon the Egyptians, while Amenophis, terrified at a prophecy, withdrew with his army to Ethiopia. But at the end of thirteen years the king and his son returned from Ethiopia, and drove out the unclean people and Shepherds. It is added that it was said that the priest who ordained their polity was Osarsiph, a Heliopolite, whose name when he went over to these people was changed to Moyses (Moses). It is quite unnecessary to refute the application of this account to the sojourn and exodus of the Israelites; though it is difficult to ascertain when the event happened on which the tradition is founded. It may refer to the shepherd-expulsion in the time of Sethee I., or to an event which perhaps happened towards the close of the reign of Menptah, which latter conjecture is not improbable, since two usurping sovereigns reigned between Menptah and Sethee II.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE ordinary meeting of the Institute of Architects was held on Monday evening, Mr. F. C. Penrose, president, in the chair.

The President announced that Mr. James Brooks had been nominated as royal gold medallist.

Value of Simplicity in Architecture.

MR. HALSEY R. RICARDO read the first paper on the above subject. Living architecture, he said, is that which answers the requirements of the day. The requirements might be modest and sensible and the architecture would be beautiful and strong; they might be affected and individual, and then the architecture would probably be paralysed; they might be extravagant and vulgar, and the architecture would be violent and vulgar in response.

Mr. BASIL CHAMPNEYS read the second paper, in the course of which he said his remarks would have special reference to churches and country houses. Simplicity was a note of highest art everywhere and in all its branches. Reticence had been as obviously a characteristic in English art as in manners. In the fourteenth century, when foreign art was developing into vagaries and extravagances, the invention of Perpendicular held eccentricity in check in this country. The idea that simplicity in architecture was found to be in an inverse ratio to inventiveness was as dangerous as it was false. If necessity were the mother of invention, simplicity might truly be said to be the daughter of inventiveness. From first to last the law held good that every building to be a work of art must originate in one central idea, and that to this idea the inventive powers must be strictly subordinated, as it was better to apparently fail in inventiveness than actually to fail in unity and keeping. Unity and beauty should be the sole aims the artist allows himself to be conscious of. Originality he would never succeed in suppressing if it was present, or in generating it if absent. In the design of every building the primary problem was to fulfil certain definite practical requirements according to established constructional laws, and it was in the spirit in which such problems were met that good architecture mainly depended.

Mr. W. D. CARÖE read two papers, one by the President and another by Mr. Ince. A discussion followed, in which Mr. Wm. White, F.S.A., Mr. Primrose and others took part.

On the motion of Mr. STATHAM, seconded by Mr. ALMA TADEMA, a vote of thanks was passed to the authors of the papers, and the meeting adjourned.

EDINBURGH ARCHITECTURAL ASSOCIATION.

A MEETING of this Association took place in the Royal Institution, Mr. W. W. Robertson, the president, in the chair. Six gentlemen were admitted to membership, and two nominations were given in.

Mr. Percy Fitzgerald, F.S.A., made a communication on "Adam Architecture in London." Having suggested that there were at present symptoms of a revival of interest in the work of this illustrious family of architects, the lecturer proceeded to deal in considerable detail with the architecture of Robert Adam, whom he described as "the flower of the flock," and a man of extraordinary versatility, dramatic power and ability. His style was inspired by Diocletian's Palace at Spalato, with all the peculiar incidents of which he became permeated. On Adam's return to this country, the lecturer showed how extensive his practice became, giving it as his opinion that no other architect ever enjoyed so large an amount of remunerative work. In London alone it was almost incredible the number of buildings he set up. As to his principles of style, one of the most outstanding features was his marked individuality, Adam putting his stamp on everything he did. His exact sense of proportion, his great care as to the minutest details, and his singularly refined taste in various directions were notable characteristics of the man. The lecture was illustrated by nearly eighty limelight illustrations of Adam's handiwork, these forming a most interesting exhibition.

Mr. Fitzgerald's remarks were very attentively listened to, and frequently applauded.

Dr. R. Rowand Anderson, in moving a vote of thanks to the lecturer, said there was no doubt that the architecture of Adam was beginning to have its weight in the architectural study of the rising generation of architects, and they were fortunate in Edinburgh in possessing some of his very best examples. The Register House, to his mind, was the finest thing they had in the city. At the same time, he thought the father's work was a much more vigorous type of work than the sons'.

Professor Baldwin Brown seconded the vote of thanks, which was cordially passed.

HOLYROOD ABBEY.

ON Saturday evening Mr. S. H. Capper, architect, delivered a public lecture on "Holyrood Abbey," in connection with the Old Edinburgh School of Art. Mr. J. R. Findlay, the chairman, at first expressed regret that the Royal apartments in Holyrood Palace, which had very considerable architectural interest, were not open for public inspection. Many of the Royal palaces abroad were so open, and at Windsor the State apartments were regularly shown to visitors, except when the Queen was in residence there. He could not see why the rooms in Holyrood Palace should be closed except to a few favoured people who were invited as guests by the Lord High Commissioner. If the members of Parliament for the city and the municipal authorities exerted themselves a little, the rooms, he thought, might be opened to inspection by the public. He would never for a moment expect to see through Balmoral or

any private residence of the Queen, but Holyrood was not a private residence of the Queen, but a palace belonging to the people. Further, he thought that the gardens at the palace ought to be opened up and people allowed to walk there. In London thousands of pounds were spent on the Royal parks every year; a couple of hundred pounds would keep the Holyrood Gardens in order, and they would be a delight to thousands of people.

Mr. Capper explained that he was to deal with Holyrood Abbey as distinct from the palace, and showed, with the help of limelight illustrations, how fragmentary were the remains of the original building. He afterwards had thrown upon the screen pictures of a number of well-known ecclesiastical buildings in England, with the view of conveying to the audience some idea of the parts of the abbey church that have been swept away. In reference to the history of the church, he recalled the legend of King David and the stag, but pointed out that it was not till after the year 1400 that mention came to be made of it in connection with the foundation of the abbey. Mr. Capper subsequently spoke of the leading characteristics of the building from an architectural point of view, incidentally saying that he shared the hope of the Chairman that the palace gardens would soon be open to the public; and, in concluding, he reminded the meeting that two districts of the city owed their names to the existence of the church of Holyrood—the Grange, which came to us from one of the barns erected by the clergy of the abbey in ancient days for storing their tithes of corn; and Canonmills, so-called because there was situated in the old days on the Water of Leith a mill for the grinding of the corn of the canons of Holyrood. The lecture was made the more interesting by reason of the series of beautiful slides which were shown on the screen in illustration of the subject.

THE MEDIÆVAL MANOR HOUSE.

A LECTURE was delivered on Tuesday before the members of the Thoresby Society, in their room at the Albert Hall, Leeds, by Mr. F. W. Bedford, on "The Mediæval Manor House: its Architectural History." He remarked that very few manor houses were built during the twelfth century. The Normans built themselves fortresses in different parts of the country, but the land had not been sufficiently subdivided to call the manors into existence. From what examples we had, however, we found that they were generally built on a universal plan of a large hall with a chamber or chambers adjoining, and this formed the basis on which all the manor houses were built up to the end of the fifteenth century. The number of chambers was increased and other alterations in their disposition took place, but still the large central hall formed the nucleus of the plan. In most examples the hall was on the ground floor level, and was used by the owner and his followers for both dining and sleeping. Nearly all the examples of the Domestic architecture of the thirteenth century were built during the reigns of Henry III. and Edward I. A great many manor houses were built at this time, but they still kept the same general arrangements in plan as in the preceding century. The customs and manner of living remained the same, and so no great alteration was needed. In the fourteenth century a great development took place in Domestic architecture. To this period belong the finest domestic and collegiate buildings we have, as the colleges of Oxford, Cambridge and Winchester, Gainsborough Manor House, Wingfield and Haddon Hall. The large hall still continued to be the dominant feature in the plan, but it was less used by the owner and his guests. In fifteenth-century manor-houses the first thing that struck us was that the hall continued just as before, excepting that in many cases its size had been reduced in proportion to the increase in the number of other rooms—withdrawal-rooms, dining-rooms and bedrooms. Since the end of the fifteenth century we have made very little alteration in the plans of our country-houses. During the Renaissance periods—the sixteenth, seventeenth and eighteenth centuries—they became more formal in plan, but did not differ materially. Great improvements of course have been made since in the practical fittings, sanitary arrangements, heating and so forth, but a fifteenth-century house was often quite as convenient, as comfortable and pleasant to live in as a modern house, and generally far more dignified and beautiful. The lecture was illustrated by means of numerous ground and upper floor plans of manor houses. After some discussion, in which Mr. T. Ambler and Mr. J. Lister, Shibden Hall, Halifax, took part, a vote of thanks was passed to Mr. Bedford on the motion of Mr. Witherby, seconded by Mr. A. E. Kirk. Colonel Wilson presided.

The Greenock School Board have invited ten architects to send in plans in competition for a school to accommodate 1,000 children, 500 infants included, and the cost is strictly limited to 10,000/.



An Inquiry into the Real and Alleged Defects of Flueless Gas Stoves.

SIR,—A case has recently come under my notice, where an "opinion" has been obtained, and a number of flueless chancel stoves, with atmospheric burners, have been condemned after four years' constant use in a London chapel. The statements made against these are so plausible and neatly put, that they require consideration before their utter fallacy and incorrectness can be seen, and the facts are of very considerable importance, as they prove beyond question not only the conditions caused by flueless stoves, but also the comparative impurities from different sources and the danger of attending crowded meetings.

The alleged objections to the flueless stoves are that "they generate thousands of cubic feet of carbonic acid, which is dangerous and unhealthy."

"The gas when burning pollutes the air with its own organic impurities."

"That the oxygen of the air in the room has fed the gas-heaters."

"That the sensation of welcome warmth prevents the badness of the atmosphere being at once recognised, but the carbonic-acid gas will produce its effect on the congregation."

"That the method of heating renders the air quite unfit for breathing."

The inquiry into these alleged defects entails a complete examination into the conditions under which the stoves and the building are used, and to prevent any personal bias I give the authorities for all statements, selecting only those whose reputations are accepted by experts as being unquestionable.

The building has floor surface of 47 feet by 41 feet by 1927·09 feet. The average height is 24 feet, and the area is therefore 46,248 cubic feet. The average congregation is 600. The floor surface is, therefore, $3\frac{1}{2}$ square feet for each person, as against the 8-feet minimum for Board schools for infants. The cubic area for each person is 81 feet as against 240 feet minimum for a registered common lodging-house (these data are taken from Dr. Whitelegge's text-book on "Hygiene and Public Health").

The building is lighted by ninety-six gas-burners; the consumption of each is not given, but taking it at the low average of 3 cubic feet, the total gas consumption will be 288 cubic feet per hour for lighting only.

The eight "chancel stoves" for warming burn a maximum of 15 cubic feet per hour each, a total of 120 cubic feet, but it must be noted that these are never used whilst the congregation is assembled; they are lighted for some hours in advance only.

Dealing first with the carbonic acid, the amount of this evolved from the combustion of coal-gas has recently been redetermined by the *Lancet* commissioners to check previous results (see *Lancet*, January 5, 1895), and the amount per cubic foot of gas is 52 cubic foot, practically one-half the bulk of the gas burnt. The alleged thousands prove to be a total of 61 cubic feet per hour.

Expired air from the lungs of an average person contains (as determined by Pettenkofer) 4·5 per cent. of carbonic acid, and each adult whilst awake gives off 8 cubic foot per hour. The 600 persons would therefore involve 480 cubic feet carbonic acid per hour, the warming stoves 61, and the lights 147, a total of 688 cubic feet per hour; allowing for absolutely no ventilation the contamination of the atmosphere in one hour would be in carbonic acid by the congregation 1 in 100 parts, by the lighting 1 in 331, and by the heating stoves 1 in 797—total from all sources 1 in 70, equal 1·43 per cent., less than one-tenth of this being formed by the heating apparatus.

The normal quantity of carbonic acid in the air is 3 per 1,000, but as shown by the careful and exhaustive experiments of Dr. Haldane and Dr. Lorrain Smith (see British Association report), if present in 100 times this amount, or 3 per cent., its presence is inappreciable except by chemical analysis, and its action is simply that of a diluent, like the nitrogen which constitutes four-fifths of the atmosphere. It is therefore evident that, in the complete absence of ventilation, the carbonic acid formed by every source is inappreciable.

The statement that the gas when burning pollutes the air with its own organic impurities is very simply disposed of. Gas is universally used for sterilising by all who are engaged in bacteriological research; the temperature required for sterilising is 400 deg. Fahr., and 1 cubic foot of gas a burning will raise 144 cubic feet of air to this temperature. Its action is therefore precisely the reverse of what is stated; and again allowing for no ventilation, and no absorption of heat by the walls, the gas burnt for lighting and heating would actually

sterilise and destroy the whole of the organic impurities evolved by the persons present. This is not the case, for the very simple reason that almost the whole of the heat is immediately absorbed by the walls of the building. By direct experiment it has been shown (see "Coal Gas as a Fuel") that 1 cubic foot of gas in burning will heat 2,460 cubic feet of air 20 deg. Fahr., and if the heat were not absorbed by the walls, the consumption of 10 cubic feet of gas would raise the temperature of the room 10 deg. Fahr. As a matter of fact, until the walls rise to the same temperature as the room they absorb at once from the air most of the heat evolved, and this explains the reason why large and powerful stoves require so long a time to produce an effect in a large building, a fact well known to all who have to deal with heating arrangements of this class.

Where the Heat goes to.—A number of careful experiments show that, in average practice, for every 1,200 square feet of wall surface, in a room with ordinary ventilation, 660 British thermal units of heat are required for every 1 deg. Fahr. rise from normal, and allowing for the usual ventilation of a complete change of air every twenty minutes, 75 per cent. of the heat is lost by the walls and ceiling. If the air is changed only once every forty minutes and the same temperature kept, 87½ per cent. must be lost through the walls and ceiling. These figures will vary with every building, but as they are taken from careful experiments in rooms which are kept at the same temperature night and day constantly, it is clear that under any possible circumstances the actual warming of the air is almost a negligible function as compared with the loss by conduction through the walls. The system of calculating the heating power by the cubic area is one which needs to be discontinued, as being totally at variance with working results. No doubt many who are accustomed to exact physical research will at once question my figures as to the absorption of heat by air, which varies enormously with the quantity of moisture present; but the answer to this is simple—the results given are those of average working for long periods in actual practice, and lower than the theoretical calculated averages; they are practical working figures which naturally come out lower than the theoretical ones, as they include sources of loss which cannot be avoided. This problem is a most complicated one, as it is affected not only by variations in ventilation caused by differences of inside and outside temperatures, but also by the heat evolved by the occupants of the buildings and the natural differences in the mean temperatures inside and out, which affect the loss by walls and other sources of error. In one case the required heat for a large building came at 277,400 British thermal units in twenty-four hours above the calculated requirements. This error was caused by the temperature at which the contents of the place (a beer-bottling stores) were brought in and removed; the surplus heat had been absorbed by the bottles and their contents.

"That the sensation of warmth would probably prevent the badness of the atmosphere being recognised," is precisely contrary to facts. Warmth always increases the smell from organic matters. Nothing more need be said on this subject further than to refer to the experiments of Dr. Morin at the hospitals of Beaujon and Vincennes, and M. Peclet at the Mazas prison and the school at Grenelle. These are sufficiently quoted in "Box on Heat."

Ventilation Required.—This varies greatly, but if the average results are accepted as given in "Whitelegge's Hygiene," and also in "Box on Heat," at least 500 cubic feet of fresh air per hour will be required for each person, with about one-tenth added for lights, making a total of 550 cubic feet for each person. The 600 would therefore require 330,000 cubic feet of air passing through the building per hour, i.e. an entire change of air every 8½ minutes, an obvious impossibility, except with a powerful forced draught of warmed air; and taking the average figures given by Whitelegge as regards natural ventilation, it is evident that the building is enormously overcrowded, a change of air every twenty minutes being the maximum under ordinary circumstances without excessive draughts.

I now come to the actual cause of the offensiveness of the atmosphere of the room, and this explanation applies more or less to all public buildings. The presence of carbonic acid, as exhaled from the lungs, is merely an indication of the presence of other and dangerous matters which accompany it; when exhaled from living beings the effect of these is, by our technical persons, ascribed to the inert carbonic acid. Dr. Whitelegge's report on this point is clear. The moisture formed during the combustion of coal-gas is perfectly sterile and does not lend itself to the cultivation of bacteria; the moisture evolved by each person in the room will average 2½ ounces per hour, two-thirds of this from the skin, one-third from the lungs. Therefore, 93 lbs. weight of water per hour is discharged by the 600 persons assembled, and in the absence of most efficient ventilation, a large proportion of this condenses on the walls. The expired air contains much organic matter, which is readily absorbed by the moisture present. It promotes the growth of organisms, has a foetid smell, and meat, milk and other food in contact with it readily becomes tainted

(Whitelegge). There can be no doubt that the walls of the buildings are covered with organic matter and bacteria, and that the congregation is far too large for safety to health. The action of the heating apparatus, as regards the purity of the air, is so exceedingly small as compared with the causes that it may be entirely ignored. The only possible emanations from the gas flames are a minute trace of sulphur which may be appreciated occasionally, but which cannot in the maximum possible proportion be considered other than harmless. The other is carbonic oxide, which, if formed, is undoubtedly dangerous; but the experiments and analysis of Professor Vivian B. Lewes show that this is not formed when gas is burnt in a clear unobstructed flame. A faint trace of this gas has been suspected from the Welsbach incandescent lights, and much capital has been made out of this by the electric-lighting companies, but the recent researches of the Lancet Commission show this statement to be entirely without foundation.

I will now deal with the real defects of flueless gas stoves, and it is very curious that none of these were mentioned directly or indirectly in the "opinion."

First and greatest is that they do not assist the necessary ventilation of the room; this defect they share with the hot-water pipes, and to a greater extent, because with the latter it is possible to make perforations in the wall behind the pipes, the incoming air being slightly warmed whilst draughts are prevented.

Second, this form of stove, to prevent the formation of carbonic oxide, must have flames which are clear and unobstructed by incandescent solid substances, which give a large proportion of radiant heat, an absolute necessity in rooms where persons are to be seated in comfort for any length of time. Heat radiating from glowing coals or other incandescent material passes through the air in direct lines, without modifying its temperature to any important extent. Radiant heat coming in contact with persons, furniture, or walls, imparts warmth to these whilst leaving the air comparatively cool. If we have moderately cool air to breathe, whilst our bodies are kept at a comfortable temperature, it is more healthy than if we have to breathe hotter air in the endeavour to obtain the same degree of comfort.

Convected (or conducted) heat by warm air has one most serious objection, that the warm air has a tendency to rise to the upper part of the room, and the upper strata becomes warmer than the lower, the feet are kept colder than the head, and the consequence is, unless circulation is assisted by moving about, a liability to cold feet and a consequent headache, the cause being, not as is usually supposed impurity of the air, but improper and unnatural distribution of the heat. In bedrooms, when the body is at one level, this objection does not exist, and there is little doubt that in this case a flueless stove will be unobjectionable, the actual pollution of the air by a flueless stove, which consumes the gas perfectly, being so small that it does not need consideration if a reasonable amount of ventilation is secured by other means. I do not wish to make myself a champion for flueless stoves. The objections, although negative and purely mechanical, are decided, but in many cases the choice is between these and a dangerous degree of cold, and it is well to know what the objections really are so that they can be modified and guarded against. The results given show clearly that, so far as actual pollution of the air is concerned, a good flueless stove is less objectionable than the presence of an extra person in a badly-ventilated room. To those who have to use a flueless stove in a room, let me suggest a simple experiment imported from the land of stoves, *i.e.* America. Put the feet up to the level of the head, so as to get them out of the cold air on the floor, and all symptoms of discomfort will disappear. When an American lifts his feet up from the cold air-bath on the floor of a room heated by a close stove, he only obeys a law of nature which enjoins him to keep his feet warm and his head cool as far as possible.

The last objection to flueless stoves is peculiar to both these and paraffin-oil stoves. They are the only sources of heat which do not dry the air of the room they are used in; this is no objection in ordinary living rooms, but is a decided one in shops where polished steel and similar goods are kept, and the balance for or against must be taken after consideration of the conditions needed. It would appear that where no flue is available they have a distinct advantage for many purposes, but their use is limited by objections which exist under certain conditions. It is evident that the carbonic acid and pollution of the air theories which are commonly held have no basis whatever in fact, and the objections are more mechanical than chemical.

The problems of heating and ventilation are usually calculated, even by architects and heating engineers, on the same basis, *i.e.* the cubic air space enclosed. This is perfectly correct for ventilation, but it has not the slightest relation to the heating power required. As already shown, the heat absorbed by air is so infinitesimal in quantity that it may be neglected; and the only matter needing attention is the heat absorbed by

the walls, roof and floor. As these bear a very close relation to each other in most buildings, it is only necessary to take the wall area as a basis; and the results of numerous experiments on both a large and small scale show that in an ordinary building without skylights, nearly one-half of one British thermal unit is absorbed by each square foot of wall-surface per hour for every 1 deg. Fahr. rise over the normal temperature maintained after the first warming up is complete. The building in question has a wall-surface of 4,224 square feet, and for every 1 deg. Fahr. rise of temperature to be maintained 2,112 units of heat will be absorbed, *i.e.* the heating power of $3\frac{1}{4}$ cubic feet of ordinary 16 candle gas, or $32\frac{1}{2}$ feet for a rise of 10 deg. It must be noted that the actual consumption is nearly four times this, the preliminary heating up requiring the excess. If the temperature was once attained throughout the building, and the heating continued steadily day and night, the gas consumption would be reduced $32\frac{1}{2}$ cubic feet per hour for every 10 deg. rise over the normal temperature. Applying this method of calculation to a smaller room, say 10 feet each way, the heating power required would be fully five times as great for the cubic area, owing to the larger proportionate area of wall-surface, and this is undoubtedly the case in practice. This is an important point in the consideration of flueless stoves; the basis given for this in the chapel in question applies only to buildings of the same size, and the heating power required increases in direct proportion as the size of the building decreases.

It would appear that the use of properly-constructed flueless gas stoves in living rooms cannot be in any way injurious to health so far as any pollution of the atmosphere is concerned. That they are, under certain conditions, uncomfortable, is an undoubted fact, but so long as the conditions are known and guarded against, as far as possible, the objections have little or no existence. Many attempts have been made to equalise the temperature at different levels in rooms warmed by flueless gas stoves, but all have been more or less failures, owing to the very small proportion of pure radiant heat available, and the natural tendency of warm air to rise. Much can be done by the use of thick warm carpets and rugs, but not sufficient to entirely overcome this one defect, which exists also with hot-water pipes, warm air and paraffin stoves.

THOS. FLETCHER, F.C.S.

GENERAL.

The Annual Exhibition of works by students of the Birmingham Municipal School of Art is now being held at the rooms of the Royal Society of Artists.

The Aberdeen Artists' Society have published the results of the last exhibition, and it appears that it was the most successful exhibition ever held in Aberdeen both from the artists and the subscribers' point of view. Pictures to the value of 2,528*l.* were sold, being 1,000*l.* more than in any former year. The subscribers have increased to 463; the receipts at the door have also increased.

Mr. Arthur Pain, at the meeting of the Surveyors' Institution on Monday, the 18th inst., will read a paper on "Light Railways."

A Meeting of the Court of Governors of the University College of South Wales and Monmouthshire was held on Wednesday, when an influential deputation was arranged to wait upon the Chancellor of the Exchequer for the purpose of obtaining a grant of 100,000*l.* for new college buildings, which it is estimated will cost between 200,000*l.* and 250,000*l.*

Sir John Soane's trustees will on Monday next meet at the Museum, Lincoln's Inn Fields, to distribute the dividends which have accrued during the year from the sum of 5,000*l.* invested by Sir John for the benefit of distressed architects and the widows and children of deceased architects.

The Royal Scottish Academy on Wednesday elected Mr. Charles Martin Hardie and Mr. George W. Johnston as members.

Mr. J. S. Crawshaw, who has for several years past occupied the position of surveyor and sanitary inspector under the late Skegness Local Board and the present Urban District Council, has been elected surveyor to the Weybridge Urban District Council, at a salary of 200*l.* a year. There were upwards of two hundred candidates for the post.

The Athens correspondent of the *Standard* says:—The excavations which a party of German *savants* are carrying out on the site of the ancient theatre of Dionysus has resulted to-day in the discovery of a subterranean passage, through which the actors in old times used to pass up on to the stage. This is the only discovery of note that has hitherto been made in the course of these excavations, which are under the general supervision of Dr. Dörpfeld, the Principal of the German Institute at Athens. A similar passage, I may add, was discovered some years ago on the site of the ancient theatre at Eretria, in the Island of Eubœa.

The Architect.

THE WEEK.

WHEN the Charter was granted to the Royal Scottish Academy about four years ago, many sanguine people imagined that the narrow-mindedness which made that institution unique in Europe was likely to come to an end. That was not our view. We had seen as much of the working of the Academy as was possible for an outsider, and from familiarity with the effects we could realise the character of its causes. Articles which appeared in this journal a long time ago could now be reprinted as if they were inspired by recent malpractices. Now, as always, architecture is doomed to be the victim. When the Scotch architects opposed the Academy's Charter before the Privy Council, their chief contentions were that the scheme did not provide for a due proportion of the funds of the Academy being devoted to the promotion of art, and that it did not oblige the Academy to have a certain proportion, or any architects in its ranks. But in spite of the representations the Privy Council granted the new Charter, merely recommending, in terms which were regarded as equivalent to a command, that in future architecture should get its proper share of attention. Following upon this, the Academy took the first opportunity to elect a number of the leading architects as Associates. They accepted membership in the belief that the Academy had turned over a new leaf, and that as members they might soon be able to render some good services for their department of art which they could not do if they stood aloof. As Associates, however, they remained without any executive power whatever, and nothing could be done for architecture by the Academy till one or more of these Associates were raised to the rank of Academicians, which it was understood would be arranged at the earliest opportunity. The arrangement could only be accomplished by giving the new Associates precedence over men who had been many years in that rank, but this involved no injustice to the old Associates, because if the Academy had been doing its duty some of these Associates would not have been members at all, and the very architects now awaiting promotion would have been in their places at the top of the list. If the well-being of the Academy required some little self-denial on the part of painters and their friends it ought to have been displayed. The desired opportunity arrived last week, but it was neglected. Regardless of all that had been agreed upon, two painters were elected. The course adopted has damaged the Academy. It gives countenance to the old reproach that it is simply an institution manipulated by certain Edinburgh cliques for their own purposes, and that it is vain to hope that it can ever be made anything else. The effect produced on the public and all interested in art would have been entirely different if two architects had been elected. The prestige of the Academy would have been immensely advanced, and its influence as a national institution strengthened. The architect-associates, who were still anxious and willing to make the best of everything, would have been immensely encouraged, and would loyally endeavour to subserve the interests of the Academy. Now it is difficult to resist the conviction that Dr. ROWAND ANDERSON was right, and that a man who wishes to aid in advancing architecture had better withdraw from all connection with the Royal Scottish Academy.

THE judgment which was given a few days ago by Lord KYLLACHY respecting one of the large hydropathic establishments at Callander would appear to show that the responsibility of leaseholders is more onerous than in England. The action was brought by the owner of the ground. In 1881 he fued or let in perpetuity certain lands to the Callander Hydropathic Company. Among the considerations were that the buildings were to be insured for not less than 15,000*l.*, and in case of fire the parts destroyed were to be rebuilt, in order that the valuation should be kept up. The buildings cost about 40,000*l.* In 1885 the property

was acquired by another company, called the Callander and Trossachs Company. Eight years afterwards the buildings were consumed, and about 14,000*l.* for insurance was paid to the company. In the beginning of 1894 the place was sold to the Eagle Property Company, and in the course of the year it was conveyed to JOHN WILSON. The "superior" or ground landlord brought the action against all the owners for breach of the agreement to re-erect any building destroyed. One company after the other pleaded that their obligations came to an end with the transfer of the property, of which notice had been given to plaintiff. JOHN WILSON, in turn, contended there were no grounds for suing him. Lord KYLLACHY held that whatever might be the law in respect of rent or duties, the transference of a feu to a new "vassal" did not relieve the old "vassal" of his obligations. Accordingly, judgment was given against Mr. WILSON, the Eagle Property Company and the Callander and Trossachs Hydropathic Company. The plaintiff agreed to having a decree for the erection of buildings of the value of 15,000*l.* While it is easy to transfer property in the North it becomes evident that in spite of conveyances the obligations remain with the party who assumed them at first, although the subsequent parties are no less bound.

IT is remarkable to find Great Britain still surpassing most countries in the world in the extent and value of imports. A return has just appeared on the trade of Stettin. It appears the value of the timber exported to all parts of the world from that port in 1893 was 216,011*l.* 12*s.* More than one-half of it went to Great Britain, for the value was 120,359*l.* 4*s.* In other words this country is as good a customer to the Stettin merchants as the remainder of the world. Yet for one important item, viz. pinewood, the English market is closed to Stettin on account of the competition offered by Dantzic. The Portland cement trade would have been successful if it were not for some accidents in Stettin. A fire which arose in the Stettin-Bredon factory destroyed nearly the whole of the kilns. Another fire at the Stettin-Chamotte factory destroyed the upper factory entirely, and work had to be carried on by day and by night at the lower factory, by which expenses were largely increased. In some of the factories about 600 men find employment.

ROME has lost a patriarch by the death of FRANCESCO PODESTI, the painter. He was within five years of becoming a centenarian. Up to the last he was without bodily pain, and as for trouble the patriarch could hardly have known what it signified. PODESTI was a type of those Italian artists, who seem as if there was something of the antique faun in their composition. As long as there was sunshine and enough money to satisfy urgent needs he was happy. He was a native of Ancona. In his fifteenth year he came to Rome, and there he lived for the rest of his life. He was employed by the late Pius IX. to paint the frescoes of the Sala della Concezione in the Vatican. PODESTI also adorned one of the churches in Ancona with frescoes. But he did not limit himself to ecclesiastical subjects. Mythology, Italian history and literature afforded him numerous subjects. The titles of some of his pictures will suggest PODESTI'S range:—*The Toilette of Venus, Europa, Proserpina, The History of Bacchus, Diana and her Nymphs, Dante and Virgil, Giotto and Dante, Francesca da Rimini, Tasso at the Court of Ferrara.*

THE publication of Acts of Parliament seems to be now a necessity with architects and engineers. Under the title "Practical Guide to Sanitary Legislation," Messrs. J. A. ANGELL and J. G. MORLEY, who are engaged as borough engineers, have brought editions of various Acts relating to public health, water supply, gas supply, electric lighting and telegraphs, housing of the working classes, local government, highways, &c. Copies of the model by-laws are also appended. A volume of the kind was long required, and the editors have taken care to make it acceptable by borough engineers. It is brought out in an excellent style by the publishers, Messrs. KNIGHT & Co.

CHARLES MERYON.

SOME fifty or sixty years since there was a physician among us who might have served as the model for THACKERAY'S Dr. FIRMIN. Instead of the classics he preferred to employ art as a subject for discourse whenever it became necessary to make an impression at a dining-table. Neither representative of the healing art was a strict moralist, and both were compelled in consequence to depart from England. The amateur found a refuge in Paris, and there a son was born to him, whom he prized not more

how could a youthful misanthrope compel his hand to represent men and women? The old buildings of Paris were hard and cold, true stony-hearted stepmothers, but compared with living beings they seemed to him as sentient with sympathy. So he resolved to express his art by their aid.

How was it to be done? He had received some lessons in painting as a hanger-on in one or two ateliers. But to paint views of buildings it was necessary to have money to buy canvas and colours, and there was no fairy queen or charitable grande dame who cared a jot about MÉRYON.



OLD HOUSE IN BOURGES.

than the ashes of a cigar. That unfortunate being was CHARLES MÉRYON the etcher. There were a great many children in Paris who, like him, were evidence that paternal affection is not a necessary quality in the human constitution, but probably not one among them was so sensitive as the English doctor's son. If he had been endowed with physical strength he would have startled revolutionists by his desire to wreak revenge on the society which he believed was made up of men like his father. But he was a weak boy from birth, and his rage merely exhausted his frail frame. MÉRYON was endowed with an artist's power. But

There was no demand at the time for etchings, but the materials for producing them were at least cheap. Accordingly he commenced the production of plates of medium size, although his hand would be more at ease in working in a large manner; but to gratify his inclination he would need copper-plates and sheets of paper which he could not acquire. Only on one or two occasions was an opportunity allowed him to etch on a large scale. One of them was a commission from the Government to reproduce an architectural painting by a Fleming. The amount to be paid was 60*l.*, which seemed like a fortune to MÉRYON, whose

only food was sometimes a few fruits out of his patch of a garden. But the plate was never completed, for while he was at work on it MÉRYON was attacked by one of his periodical fits of insanity, and was carried off to Charenton.

There never was an artist whose work was more representative of the conditions of his life than MÉRYON'S. It was only natural that he should like to represent the demons who from Notre Dame seem to revel in anticipating the time when the respectable sinners will be all found out and handed over to them to receive their punishment. Or he shows the beautiful residence for the swifts made of the most delicate of tracery and sculpture. MÉRYON was very fond of introducing a crowd of them in his skies; perhaps he may have felt that nature was kinder to them than to himself. But whatever his subject, he is sternly true to it. He never glosses over real things. Has he to represent a long line of Paris quays, he becomes indifferent to the charge of monotony and will not show an inch of cornice or moulding in an imperfect state to gain variety. If a range of buildings has 200 square windows he will not allow his hand to suppress one of them. As if to suggest the insignificance of his fellow men, he commonly represents the few figures he introduces as insignificant and excited. In that way he helps to emphasise the majesty and calm of some of the fine buildings and engineering structures.

their efforts to gain recognition of his genius, were wasted on MÉRYON. His suspiciousness was increased by his privations. He imagined that his friends were really trying to puff him in order to gain money by speculations in his etchings. There was, however, no end to MÉRYON'S illusions. Like GERARD DE NERVAL, who resembled him in many ways, he was smitten with the charms of an actress, and although in neither case was there an amorous word spoken, MÉRYON believed he had poisoned his fair one and buried her in his little garden. Whenever he could assure himself the police were not watching, he spent his time in digging for her remains.

The calamities which befell CHARLES MÉRYON have had the effect of creating an interest in his etchings. But their intrinsic merits are so high there is no need of any extraneous circumstance to make them attractive in the eyes of those who can appreciate works of art for their methods. So many men have taken up etching since 1868—the year in which MÉRYON passed away—his work may appear to be lacking in qualities which are visible in the windows of every print shop. The plates of modern artists may show more elaborateness and richness of effect, but we doubt if any of them have been more successful in suggesting the character of the architecture of old Paris and some of the provincial towns than the son of the English doctor. By the kindness



VIEW OF APSE, NOTRE DAME, PARIS.

Whatever may be the subject, there is consistency throughout the plate. We may suppose that one represents five minutes' work, or five days', or five weeks' constant toil. But, whether the time was long or short, MÉRYON apparently continued in one mood while etching, and that is the more remarkable if we remember that he could not be always held responsible for his thoughts, words, or actions. Yet his work is as sane as the production of a machine.

MÉRYON wanted only food, raiment and a shelter. He offered his plates at a price corresponding with his modest needs. But the amateurs were indifferent to them. His first series of Paris, consisting of fifteen etchings, was published at thirty francs, and was a failure. A set is now worth a large sum, for MÉRYON in disgust defaced the plates. Soon afterwards it was demonstrated in the auction-room that MÉRYON'S work brought profit to the purchasers, but the unhappy artist found it was no less difficult to sell a plate. Strange to say, the praises of such influential critics as BAUDELAIRE, PAUL MANTZ, BURTY and GAUTIER were fruitless for him. BAUDELAIRE described MÉRYON as the true type of the finished etcher, in whose work the best qualities of the ancient masters was to be seen. It is melancholy to relate that, owing to his mental infirmities, all the praise of the few enthusiasts, all

of the direction of *L'Art* we are enabled to give reproductions of two of his etchings, viz. one of the views of Notre Dame, Paris, and another showing an ancient house in Bourges. They are part of the series exemplifying all classes of work which have made the publication famous.

ENGRAVED JEWELS.

WHEN we look at a collection of antique and Renaissance sculptured stones like that which is the great attraction of this year's winter exhibition at Burlington House, it is difficult to suppress the regret which arises over the changes in fashion and manners which have brought one of the most beautiful of arts into neglect. A thing of beauty, as every one now knows, is a joy for ever, and a man who possesses the tiniest Greek gem is endowed with a treasure which is enough to make him envied by all men. But few would now care to expend the money that would be required for the production of an imitation of that class of work in our day.

The history of engraved gems confirms the fact that art in all ages depended on utility. The primitive records suggest that in a remote age precious stones were not employed simply for their beautiful colours. Those, for

example, which MOSES records to have been engraved by BEZALEEL for the ephod of the high priest, owed their importance to the names of the tribes of Israel. We find also that other stones were precious because the temporary possession of one was a credential of the bearer's representative character. It is not impossible that among the reasons which led to the recent rejection of the Chinese envoys by the Japanese was the absence of one of the seals or rings of the Emperor. In old days an ambassador who was not furnished with a similar token of confidence would receive treatment as ungracious as befell the gipsy when he posed as a representative of majesty, as described in "Quentin Durward."

It is possible also that some of those jewels acquired a character which demanded reverence, as if they were in some mysterious way connected with the gods. CLEOPATRA may have set more value upon her ring which bore the portrait of BACCHUS than on those which represented her evergreen youth. Her lover, broad-browed CÆSAR, may have believed that he possessed the protection of VENUS as long as he wore on his finger the portrait of the goddess. His rival POMPEY suggested himself by having a lion holding a sword engraved on his ring, but he was compelled to succumb to the devotee of VENUS.

As time rolled on the real or imaginary virtues of jewels were forgotten. They were looked upon as mere articles of luxury, and men and women sought to possess a vast number of them. The Roman gentlemen, especially of the Decadence, exhibited so many they were at last unable to bear the weight of them. A dandy was compelled to have two sets of rings, one for winter use and one for summer. We may suppose that the metal work of the summer rings was of lighter weight and that the stones were removed from the winter rings. It became necessary also to have sham jewels, many of which are now equally prized with the rarest stones; they become precious by the beauty of the engraving. Imitations were especially needed in the days when jewels were worn not only on the fingers, the wrists and the neck, in the hair and as girdles, but were also employed to add magnificence to robes and to sandals. The Nepaulese prince who some years ago startled London and Paris by his diamond turban, carried a large quantity of paste, and in old Rome an arrangement equally economical was likely to have been employed. His diamonds were not engraved, but as well as can be made out from the descriptions of Roman luxury, a stone was not much prized unless it bore some emblem. The employment of engraved stones as a sort of *passementerie* could not fail, however, to deprive them of many of their old associations.

Christianity was not favourable to the ostentation that was expressed by jewels. But a use was found for them. A great many were taken for the adornment of reliquaries and church plate, shrines, &c., although the subjects represented were not always the most appropriate. St. Mark's, Venice, still preserves some ancient examples, and many remained in French churches up to the period of the Revolution. The Abbey of St. Denis was probably the richest in that way.

It may seem strange that ancient jewellery should be so employed. We cannot imagine the clerics were always ignorant of the significance of the subjects that were engraved. We suppose they considered it was by divine agency that paganism should in that way be made to serve the interests of the true religion. At least, we have no right to cavil at the taste which has preserved so many examples of ancient art. What is more, the gems are the best preserved of all the works by Greek hands. Time has abraded the surfaces of marble statues, ancient temples are ruins, but the infinitely little examples of ancient sculpture are almost in the same condition as when they were handed over to the amateurs who first purchased them. On that account it is possible that the portraiture of the gems is more faithful to the originals than any of the busts. The accuracy seen in some of the representations of statues which have survived creates the confidence that many figures are no less accurate, although we have no means of testing them.

We have to thank Florence for the revival of the interest in glyptic art. The far-seeing LORENZO DE' MEDICI not only was an enthusiastic collector, but he em-

ployed artists to execute similar works. He set a passion in his city. The Florentines could not well wear the garb of the ancients, but at least they could make use of their rings. GEORGE ELIOT is true to history when she represents TITO MELEMA having a passport to fortune in the gems which were entrusted to him. And old BARDO is described as wearing rings that were massive, as ROMOLA knew to her cost. As the supply of ancient examples was limited, and not adequate to the demand, it is no wonder in Florence, and afterwards in other cities of Italy, gem engravers arose whose works are hardly surpassed by the best of those of a later time.

The power to distinguish between ancient and modern work has attained with some connoisseurs the character of a science. As the scale of figures is small, a microscopic examination is indispensable. A knowledge of mineralogy is advantageous, for a good deal depends on the character of the stone employed. The polish which a stone acquires by centuries of attrition is very different from what can be obtained by a quick mechanical process. Some imitators have turned old forms of an inferior class into costly objects by working up the contours of the figures, the test offered by the character of the stone being in favour of the deception. It is not easy to imitate Greek figures of the best period, but imitations which are very weak gain strength when surrounded by inscriptions every letter of which is a faithful copy of an ancient example. Facility in imitating lettering enables names of artists to be given which become a bait to the unwary. Some authorities maintain that genuine gems should be either round or oval. But it is possible that many gems of which parts were broken were altered in shape to a rectilinear form at a time when the value of a curved outline was not recognised. Strange to say Renaissance gems are more thoroughly executed than genuine antiques. The scale being small the Greek artists imparted prominence to the principal figures, not only by their position on a plane, but by the elaborateness of the execution.

The collection in Burlington House is not very large, and all the gems are not perfect, but it affords excellent material for those who have only an elementary interest in the art. The opportunity should not be lost for studying them. The national collections may be far the finest, but objects that are always available are too often neglected. If the art is not popularly appreciated in England, it is not for want of specimens that are as fine as any to be seen in Europe.

CHRIST'S HOSPITAL.

ON January 4 last Messrs. Hollams, Sons, Coward & Hawksley wrote to Mr. Alderman Vaughan Morgan, treasurer of Christ's Hospital, on behalf of Sir H. W. Peek, explaining that there appeared to be a general opinion that the proposed removal to Horsham was undesirable, and offering the hospital 100 acres of well-timbered land at Wimbledon, with a frontage of about two-thirds of a mile on Wimbledon Common, on moderate terms. They added that Sir Henry Peek would be willing to entertain a proposal for payment of a considerable portion of the purchase money by way of permanent rent-charge, and that he was actuated rather by a desire to benefit the charity than to dispose of the property, which was obviously suitable for immediate building operations. To this Mr. R. L. Franks, clerk of Christ's Hospital, replied on January 9, stating that the offer had been submitted to the Council of Almoners, and that he had been directed to decline it. Messrs. Hollams, Sons, Coward & Hawksley wrote to Mr. Franks on January 18, complaining that no reason had been given for declining the offer, and adding that Sir H. W. Peek was prepared to sell the property at Wimbledon at the same amount per acre as was paid by the Mercers' Company, with the sanction of the Charity Commissioners, for the site of St. Paul's School at Hammersmith, and that he would, although he felt it to be a very undesirable property, relieve the charity of the property at Horsham for such sum as valuers mutually appointed, or their umpire, might fix as the value. He would also, subject to deduction of the value of the Horsham property to be thus acquired by him, accept payment of the whole of his purchase money by way of perpetual rent-charge, following the precedent sanctioned by Parliament for compensation to Lord Spencer from the inhabitants of Wimbledon. The firm added that this course would enable Christ's Hospital at once to agree with St. Bartholomew's Hospital in respect of a substantial portion of the Newgate Street site, payment for which would provide funds for the

requisite new buildings for the school, and, in the meantime, there would be two large houses in which part of the work could temporarily be carried on. To this Mr. Franks replied on February 6, stating that the letter had been read to the Council of Almoners, and he was instructed to reply that the Council, having unanimously decided to build the schools at Horsham, could not reopen the question. Sir Henry Peek, in another letter, says that he still hopes for the sake of the future of the school that a better site than Horsham may be obtained, and that he cannot understand the inertness of the Charity Commissioners in the matter.

EDINBURGH MEMORIAL TABLETS.

ABOUT a year ago, says the *Scotsman*, an anonymous donor presented to the Edinburgh Pen and Pencil Club a sum of 100*l.* to start a scheme for affixing memorial tablets to houses in the city which were connected with the history of distinguished literary men and artists. It was a condition of the gift that the great names first dealt with should be those of Scott, Burns, Adam Smith, David Hume and Henry Raeburn. The original proposal was afterwards supplemented by an offer from the same source to defray the expense of erecting a tablet on the house in Comely Bank, occupied for two years by Thomas Carlyle. Very satisfactory progress has now been made with the scheme. Tablets to Scott, Burns, Hume, Raeburn and Carlyle have been completed, and those to Adam Smith, Brougham and "Christopher North" have been ordered, and are in course of preparation.

The special committee of the club entrusted with the carrying out of the scheme resolved to treat each case separately, so as to make the design of the tablet harmonise with the architectural character of the building to which it was to be attached. They also consulted the proprietor or the occupant of each house both as to the design and as to the material of the proposed tablet. It is satisfactory to know that in nearly every instance their proposals have met with a most cordial response. In only two cases thus far have their efforts failed. On the other hand, the proprietor of the house in York Place which Sir Henry Raeburn built and occupied as a studio (Mr. William Bartholomew), not only welcomed the advances of the committee, but agreed to defray the additional expense of a design somewhat more ornate than that which the committee submitted to him.

The completed tablets may now be briefly described:—

Sir Walter Scott.—In this case the inscription, enclosed in a sunk moulding, has been carved on the stone of the house, 39 Castle Street ("Dear 39"), which Scott occupied for twenty-eight years, and in which he wrote most of his novels. The panel thus simply formed is over the middle window of the dining-room, and bears the legend—"In this house Sir Walter Scott lived from 1798 to 1826."

Robert Burns.—The house in which Burns lived during his first visit to Edinburgh was in Baxter's Close, but the window of his room overlooked Lady Stair's Close, which is further west. Baxter's Close has been swept away, but Lady Stair's Close is extant. The adjoining land, 479 Lawnmarket, was lately rebuilt in solid fashion, and the architect, without any idea of an ulterior use, left in his design a stone panel over the entrance to Lady Stair's Close. The committee obtained the permission of the proprietor to place in the panel thus opportunely left a bronze tablet bearing the following inscription:—"In a house on the east side of this close Robert Burns lived during his first visit to Edinburgh, 1786."

David Hume.—The great historian spent his later years and also died in the house at the corner of St. Andrew Square and South St. David Street. Indeed Burton tells us that the street was so named in humorous irony by a daughter of Baron Ord in honour of David Hume. The tablet, a handsome slab of red granite, has been placed on the St. David Street end of the house, and bears the inscription—"In this house David Hume lived, 1772-76."

Thomas Carlyle.—Carlyle lived for two years in 21 Comely Bank. On the front of the house a red granite tablet, very similar to the Hume tablet, has been placed, with the legend—"In this house Thomas Carlyle lived from 1826 to 1828."

Sir Henry Raeburn.—This great artist lived during his later years at St. Bernard's, to the west of Edinburgh; but he built the house 32 (formerly 34) York Place, and occupied the upper floor as a studio for several years. The tablet, which is of freestone, inserted between the first and second floors, consists of a palette over a massive wreath suspended from rosettes. The palette bears the inscription—"In this house, built by him, Sir Henry Raeburn painted from 1798 to 1809."

The other tablets for which arrangements have been made are those to Adam Smith, Lord Brougham and "Christopher North." The Adam Smith memorial will be placed in the Canongate at the head of Panmure Close, which leads to Panmure House, which the author of "The Wealth of Nations"

occupied for many years. The Brougham tablet will be placed in the front of 21 St. Andrew Square, where the great chancellor was born in 1778, and where he spent his boyhood. The "Christopher North" tablet will be placed on 6 Gloucester Place, where John Wilson lived from 1825 till his death in 1854.

The second group of Scots worthies to be attacked by the Pen and Pencil committee consists of Principal Robertson, Hugh Miller, Dr. Chalmers, Dugald Stewart, Lord Jeffrey, Sir William Allan, Dr. Gregory and Napier of Merchiston. Other groups have been arranged, and will be taken up subsequently as funds are provided.

The special committee of the Pen and Pencil Club charged with the carrying out of the tablet scheme includes Professor Masson, Dr. Scott Dalglish, Mr. W. W. Robertson, Mr. W. D. Mackay, R.S.A., Mr. W. W. Macfarlane and Mr. John Harrison, on the last of whom, as convener, the main burden of correspondence and negotiation has fortunately fallen.

IN AN EGYPTIAN TOMB.

HAVING seen an announcement that M. de Morgan, of the Ghizeh Museum, had found at Dashur the jewels of an Egyptian princess of the twelfth dynasty, "Amy Strachey" and her husband decided to pay a visit to Dashur, and the former contributes to the February number of the *National Review* an account of the journey. After dealing with the attractions and humours of the journey, and of their being lost and found in the desert, she goes on to describe the arrival at the tomb:—"Profound was my dismay when we arrived at a hollow in the sand and, descending it, M. Pierre pointed to a sort of well about 10 feet square (speaking very roughly) and said, 'Il faut descendre là.' The entrance to the tombs of the princesses is at the bottom of this mummy pit." "And to the king's chamber?" I asked. 'Egalement,' said M. Pierre, dashing my hopes with a polite bow and wave of the hand towards the pit. There are some terrors which are more powerful than the feminine fear of being thought a fussy coward, and to be lowered down a mummy pit about 40 feet deep was more than I could face. At that moment we were joined by M. de Morgan himself, and I told him my fearful anticipations. 'Go down, Pierre,' said he, 'and show how easy it is.' So a rope was simply attached to M. Pierre's waist; the end was held by four Arabs and without machinery or pulleys of any kind he was quietly dropped over the edge. I was not reassured in the least, and sitting down in the shade I said I would await for the reascent of the party." Hearing, however, that the tomb was a thing not to be missed, she plucked up courage to descend, and describes the visit to the princess's tomb and the king's chamber. The latter is the more interesting. "The height of the underground passage leading to it drops," she says, "almost immediately from just under 6 feet at the entrance to about 3 feet 6 inches, and towards the heart of the pyramid, where the rock is very rotten, the passage is shored up by the short wooden props with which we had seen the camels laden at the south pyramid. At last the gallery sinks to a mere hole to be crawled through. The heat was great. Just then an extinguished candle gave evidence of the quality of the air, for it proved impossible to light a match to rekindle it, and the glass chimney being taken from a petroleum hand-lamp carried by one of the men, the flame of this also went out, leaving the party almost in the dark. But M. Pierre promised fresher air in the chamber itself, and the rekindling of the lights was left till then. After proceeding for about 20 yards through this 2-feet high hole, the miner's gallery breaks into the ante-chamber to the king's tomb. The chamber, lined with Tourah limestone, is encumbered with heaps of earth and rubbish on the ground, while on the west side a narrow doorway gives entrance to the tomb itself. Here the same confusion reigns—the great sarcophagus of finely polished rose-granite yawns empty and desecrated at the end of the chamber, the royal mummy having long since perished, hastily snatched from its resting-place and cast aside in the eager search for gold. Strange irony of fate, which turned the treasure piously dedicated by the survivors to the use of the dead into the inevitable cause of the violation of their tombs. The whole of the king's chamber is lined with the royal rose-granite, strangely enough overlaid with a coat of whitewash. So also is the passage down which the funeral procession passed. About 6 feet high, slightly vaulted, and with the masonry finished magnificently, it opens from the north-east corner of the tomb, going due north for some way and then turning straight to the west. It is not possible to go down it far at present, as the debris of the wall by which the robbers broke into the tomb encumbers it still. It is on the sides of the deep doorway leading from the royal chamber to the ante-chamber that the figures left by the robbers are outlined. Imagine the hour, four thousand years ago, when, resting from the work of ransacking the tomb, one of the men daubed up these rough

portraits of his fellows on one side of the doorway. On the other side, the figure of the king of the robbers stands alone, crowned with the identifying head-dress. Some of the chief interest of the great king's tomb now comes from this rude fellow's scrawlings, 'for so the whirligig of time brings in his revenges.'

THE HELLENIC SOCIETY.

A PAPER was read by Mr. J. L. Myres on Monday on researches in Caria. The paper was, he said, the result of observations made by Mr. Paton and himself in 1893 and of others by Mr. Paton and a Greek friend in the autumn of 1893 and the early part of 1894. The ground covered was the country which bordered the Latmos Gulf. The northern part of the country was chiefly explored by Mr. Paton and the south by Mr. Paton and himself. The modern road from Miletus followed the ancient track from Miletus to Iasos, and traverses a dreary plateau which in ancient times smiled with the abundant olive, and in which they found an ancient oil press of classical type. They discovered considerable remains of Lelegian masonry quite untrimmed, but still solid. The site of Keramos was perfectly well identified, and they were able to verify passages in the 13th and 7th books of Strabo in which the tombs and other buildings of the Leleges were described. It would appear that this district ceased to be inhabited after the third century B.C., as there were no traces of pottery or other remains which could be ascribed to a later date. There was a conjectural identification of Burgasa from Strabo at a point between Halicarnassus and Keramos, and the remains were found of one or two marble buildings, but no inscriptions. No ruins were found near Miletus, but in the agora of Kos was a plane tree of immense age, which might have existed in classical times. Callisthenes, quoted by Strabo, identified Pedasa with the Leleges, and Strabo seemed to know of two Pedasas, and Mr. Paton's observations appeared to be confirmed by the language of Strabo. The Leleges had eight cities, of which six were incorporated by Mausolus with Halicarnassus. Other passages from Herodotus and Livy also throw light on the labours of the English scholars. They discovered a fine tower of præ-Mausolean Carian masonry and one portico 24 feet by 10 feet of præ-Mausolean architecture. The paper was illustrated by a number of photographs of the various sites explored.

ARCHITECT'S FEES.

A CASE was heard in the Southampton County Court in which Mr. W. B. Hill, F.S.I., surveyor, valuer and estate agent, Southampton, sought to recover from Joseph Kaphan, fried fish merchant, Canal Walk and St. Mary Street, the sum of 22*l.* 2*s.*, made up as follows:—To receiving (in September) instructions, taking measurements and memoranda, preparing plans, elevations and specifications for rebuilding, and submitting same to the defendant, 20*l.*; to preparing set of tracing and plans, and forwarding same with application to the Urban Sanitary Authority, 2*l.* 2*s.* It was stated by Mr. Lamport that the amount claimed consisted of the usual architect's charges for work done on the instruction of the defendant. At the time the defendant was under an obligation to carry out the repairs to the building in St. Mary's Street, and lay out a sum of about 800*l.* on the premises. The plans were prepared and sent to the Urban Sanitary Authority, but they were returned to be amended in some slight particulars. The plaintiff wrote to the defendant reporting the result of the submission of plans, and asked him to call so that alterations could be carried out; but Mr. Kaphan instead of going near the plaintiff had other repairs of a different character, having purchased the freehold in the meantime. The defendant had declined to pay these usual charges.

Plaintiff gave evidence in support of his case. In reply to Mr. Emanuel for defendant, he said he was trying to do his best for the defendant in the plans, and the Council sometimes made concessions. He could very easily alter the plans to meet the requirements of the by-laws, and would have done so free of cost.

Mr. Wheeler, architect and surveyor, having charge of that department for Mr. W. B. Hill, stated that the charges made were reasonable. He admitted that by the alterations of the plans two rooms would be cut off, but they could easily be put somewhere else.

Mr. Mitchell, jun., a member of the firm of Messrs. Mitchell, Son & Gutteridge, gave evidence as to the fairness of the charges made.

Mr. Lamport contended that an architect would not lose his fees because the authorities did not sanction the plans, and especially was this the case when the architect was prepared to rectify the plans. This was a point of great importance to architects.

Mr. Emanuel, for the defence, urged that it was a novel situation for a surveyor to say he had made a mistake in his plans; that he had prepared plans which were useless, upon which the borough authorities would not allow him to proceed, and that he should write to the defendant asking him to come and show him what he was to put right. It was the duty of the plaintiff to send plans which could have been acted upon. He also contended that this was a contract to do the plans and carry out the work for 5 per cent.; it must be taken as a whole, and was not divisible. He also pointed out that the place had only been painted, and defendant intended to build.

Mr. Lamport wished to know whether plaintiff was to wait for his charge until the defendant was in a mind to build?

Defendant gave evidence stating that the two rooms, which would be cut off by the alterations of the plans, were necessary to meet his requirements.

In reply to Mr. Lamport, defendant said he had been unable to build because he had become his own freeholder. When he had the money he intended to build, and would engage the plaintiff to superintend the carrying out of the work, but he would not pay anything on account.

William Henry Killick, assistant borough surveyor, spoke to the plans prepared not being in accordance with the by-laws, and if anyone persisted in building upon these plans there would be a summons issued, and an order could be got to pull it down.

Answering Mr. Lamport, witness said he did not remember one instance during the two years and a quarter he had been here where the committee had sanctioned less air space at the back or side than 150 feet. Witness, in reply to the judge, said the plans should have shown the drains.

Judge Leonard nonsuited the plaintiff, without prejudice to an action in the future if the defendant ignored the plaintiff in his carrying out the building.

Mr. Emanuel assured his Honour that the defendant intended to build, but was waiting for the money.

Mr. Lamport said he was sorry he must appeal, as it was an important case to architects.

TESSERÆ.

Ogham Inscriptions.

THE inscriptions in the Ogham character, as they stood originally, were with few exceptions read from left to right. Beginning from the lower part of the stone on which they were engraved, though not at the very extremity of it, they run upwards, and the line of characters is frequently carried on over the top of the stone and then down along another of its faces or angles. Some of the names on the stones are actually Latin. In general the names appearing on the stones are such as commonly occur in early Irish church history, sometimes however slightly modified in the attempt to give them a Latin form. That the alphabet is not a very ancient one is sufficiently manifested by the arrangement of the letters. The five vowels, *a, o, u, e, i*, are formed into a group arranged in that order, thus manifesting the art of the grammarian in distinguishing vowels from consonants, and again in dividing the vowels into two classes of broad and slender. It may be added that the steganographic character of the Ogham presupposes the existence of an older alphabet of the ordinary kind. A comparison of the Ogham alphabet with the Persepolitan and Phœnician alphabets manifests that the pretended relationship between it and them has no existence. The single fact of the Ogham inscriptions indicating an acquaintance with the Latin language might be considered sufficient proof that they are not remnants of a pagan civilisation anterior to the introduction of Christianity into Ireland. For whatever may have been asserted with respect to the influence exercised by Phœnician merchants or colonists upon the religion, learning and arts of Ireland, it has never been pretended by writers on the antiquities that there existed there, in the remote pagan times, any active element of civilisation derived from Roman sources. But in addition to this use of the Latin language in Ogham inscriptions, there are other circumstances relating to them which manifest their connection with Christian times and usages. A considerable number of the Ogham monuments bear crosses of different forms. In order to get rid of the obvious inference which this fact suggests, some of the antiquaries who maintain the pagan origin of the Ogham character have boldly pronounced the supposed crosses to be pagan symbols. Others have conjectured that the crosses were inscribed at a comparatively recent period on Pagan monuments previously erected. In reply to the former assertion, which is unsupported by anything like proof, it is enough to state that the crosses are undoubtedly Christian, being perfectly similar in form to those occurring on early Christian monuments in Ireland and elsewhere. The latter hypothesis fails to account for the presence of the cross on a stone inscribed "Marianus," that name being decidedly Christian. Moreover,

there seem to be not the slightest grounds for doubting that the crosses on many of the stones are of the same date as the inscriptions which they bear. If it be asked why these monuments do not all bear the sign of the cross, supposing that they all belong to the Christian time, it is answered that some of them, for what we know, may have been the monuments of Pagans, seeing that Paganism survived in Ireland for centuries after the coming of St. Patrick. But it seems much more probable that they are the sepulchral monuments of Christians, on which the cross was not placed, either for special reasons, having reference to the individuals, or because it was not the custom of the time or place. There are similar pillar-stones in Cornwall and Wales, undoubtedly Christian monuments, on which the cross is wanting. Another significant fact in connection with the use of the cross on Ogham monuments is their general occurrence in localities where there yet remain traces of ancient ecclesiastical or monastic institutions. It appears scarcely accidental that in four instances groups of Ogham stones, seven in number, should have been discovered together. It is not improbable that these were the grave-stones of monks, whom we know to have been in the habit of living together in companies of seven. The chief objection raised by those who assert the Pagan character of the Ogham monuments rests on the discovery of so many of them in the interior of raths. That this objection should have any weight, it must be assumed that the rath was a structure confined to the Pagan times, and employed by Pagans only. So far, however, is this from being true, that we have on record abundant proofs that rath-building was in use amongst the Christian inhabitants of Ireland from the time of St. Patrick down to the middle of the thirteenth century. Churches were built in raths, and raths round churches, no doubt for the purpose of securing protection for the persons and property of ecclesiastical establishments in unsettled times.

Character in Architecture.

When we propose to ourselves to design a building, the very first question that should present itself ought to be, what character will it be most fitting to impart to our work? For we may be well assured of this—that however exactly our building may be in accordance with the ordinances of architecture, whatever may be its merits as a composition, however unexceptionable may be its details, if the general character of the building be not in harmony with its purpose, a fundamental defect exists for which no amount of art will compensate. Whereas, if the character of the building be in accordance with its purpose and destination, a favourable impression is produced which reconciles us to many blemishes of detail. For example, the principal front of the Imperial Palace at Vienna—a building which has all the worst vices of the most corrupt German school—yet possesses in its well supported character the great redeeming merit of appearing really like what it is, a great imperial residence. The garden front of Versailles may be cited, on the contrary, as an architectural composition sadly deficient in character, with little claim to the attribute of grandeur beyond its enormous length, and but feebly suggesting the idea of a great monarch's residence. To seek for an illustration nearer home, take the Banqueting House, Whitehall, a building the architecture of which seems remarkably expressive of the festive purposes for which it was originally designed, and this illustration is the more instructive when we have regard to the manifest unfitness of the building in all its features, internal and external, to an ecclesiastical purpose. There never was a more grievous misapplication of a fine piece of architectural composition. This quality of character may be described as a consideration involving so much more of feeling and judgment than of abstract reason, or of what logicians term dialectics. It would, therefore, be a hopeless attempt to lay down definite rules for insuring propriety of architectural character. We have neither numbers nor figures nor words by which the relative merits or the essential attributes of art can be gauged or compared with mathematical exactness. We want, and shall never find, a golden mete-wand, which shall serve to reduce genius to a matter of calculation, or to supply an unfailing criterion of good taste. We may, however, safely say generally of a building, that its character is well conceived if the intelligent observer be at once impressed by the congruity of its aspect with its destination. An hospital should not look lugubrious, and statues of maniacs should not decorate the portals of a lunatic asylum, as was the case at Old Bedlam. That would be a gross misapplication of the principle; yet, in such structures as these there is a plain propriety which forbids the architect to admit an air of levity into his work, or to indulge in fanciful decoration. To give to a court of justice the riant air of a place of public amusement, or to give to a private gentleman's residence the aspect of an ecclesiastical structure, or of a crenellated fortress in the days of catapults and cross-bows, would be to commit a solecism which no abstract ingenuity of design nor antiquarian correctness could possibly justify.

Pre-Norman Architecture in Ireland.

The native or Celtic style, much anterior to the incursions of the Danes or the Norman conquests in Ireland, is seen in churches of small size, like a Roman basilica shorn of its apse; rude massive buildings oblong in plan, with triangular-headed small windows, pyramidal shaped doors and cyclopean or Pelasgic masonry. This and the following style occupied the interval between the fifth and sixth centuries and the year 1176. The early Scottish, Anglo-Saxon and French churches of the sixth century were all parallelograms. It is remarkable that the Greek oblong temple, composed of a nave and shrine, like the Temple of Jerusalem, also consisting of oracle and nave, 116 feet 3 inches by 37 feet 6 inches, and 58 feet 1½ inch in height, were both derived from an Egyptian original. The architect of the temple on Zion was of Tyre, a Phœnician colony; and while the legend of Cadmus, a Phœnician and the civiliser of Greece, denotes a correspondence between those countries, the commerce of Tyre with the western isles is boldly asserted by many writers. These early churches, rather oratories than capable of holding a congregation, range from 20 feet to 60 feet in length; they are aisleless, rectangular, have no apse, and are never found in a circular form; sometimes they are provided with a small chancel, and occur in groups. On Mount Athos, in other parts of Greece, and in Asia Minor, churches were usually built in groups of seven, in remembrance of the seven churches of the Apocalypse. The round towers are of this period, which lasted till the eleventh century, but are continued until the thirteenth century. Their form was adopted in consequence of the difficulty of obtaining cut limestone for the corners. Their purposes were various; they have been variously represented as serving for a belfry, a beacon, a treasury and a retreat for the priests. In the fourteenth and fifteenth centuries they were replaced by tall narrow square central towers. In the earlier towers the parapet is plain, with a range of holes instead of gargoyles for letting off the water; in later buildings there are stepped battlements resting on corbels. The Saints' houses, the beehive houses of Connemara and the oratory of Gallerus, are of "cyclopean masonry," built of masses of rock and vaulted with stone roofs, but the latter are of a later date, and are provided with chambers. In St. Kevin's, Glendalough, the lower structure is of the seventh century. The upper tunnel vault was provided with ribs, on which were laid the horizontal courses of the outer roof, which was built up straight to throw off the rain; this plan was also adopted in Cormack's Chapel, Cashel, built 1127-34. The vault, upper chamber and belfry are of the twelfth century. The cathedral of Glendalough is full of interest as one of the earliest Irish structures. The east window and south door, however, are of the beginning of the thirteenth century. In the succeeding style of native architecture, the roof became flattened, chevron mouldings were introduced, the arches received semicircular heads in place of triangular pediments or square lintels, windows became larger, and chamfered beadings ran round the inner arch, and the masonry was inferior. The peculiar cairn-like shaped door, formed of three stones, two jambs sloping upward towards a horizontal lintel, lasted throughout the various styles, and took its origin, like the round tower and cyclopean masonry, in the stubborn nature of the building material. Within the Pale the English introduced the Early English after the Norman style. But the early architecture of the isles, Northumbria and North Wales, bore a great resemblance to each other. Dublin appears to have been the architectural school of North Wales later.

The Rise and Fall of Spanish Art.

Among the most remarkable features in the history of Spain are the rapid growth and decay of her power. She first began to rank among the great kingdoms in the reign of Ferdinand and Isabella. Their great grandson, Philip II., was the acknowledged leader and protector of Catholic Europe. Under Charles II., great grandson of the second Philip, Castile had ceased to produce statesmen and soldiers, and Peru to furnish ducats, at least to the royal treasury. The monarchy was as feeble as the monarch; its star had run its course in little more than six generations, rising at the end of the fifteenth and setting at the end of the seventeenth century. This era was likewise the great period of literature and art in Spain. Growing up with her political greatness, they added lustre to her prosperity, and a grace and charm to her decline. During the Middle Ages, her taste and imagination had been embodied in the unrivalled multitude of ballads, sung by unknown bards, part of which the Castilian romancers still preserve, and in the magnificent cathedrals reared by nameless architects in her Christian cities, the songs and the shrines being equally tinged with the colouring of northern piety and oriental fancy. The reign of "the Catholic sovereigns" is memorable for the discovery not merely of a new continent, but of vast regions of intellectual enterprise. History, the drama and painting were revived in Spain in the same stirring age that sought and found new empires beyond the great ocean. Pulgar, the father of Castilian

history; Cota, the earliest forerunner of Calderon; Rincon, the first native painter in the Peninsula who deserved the name, were the contemporaries of Columbus, and, with the great navigator, mingled in the courtly throngs of the presence-chamber of Isabella. The progress of refinement during the first half of the sixteenth century was, perhaps, more rapid in Spain than in any other country. The iron soldier of Castile, the Roman of his age, became the intellectual vassal of the elegant Italians whom he conquered. Under the Emperor Charles V. the Iberian Peninsula, the fairest province of Ancient Rome, grew into the fairest colony of modern art. The classical Boscan and Garcilasso and the many-gifted Mendoza left behind them monuments of literature which might bear comparison with those of Italy, Berruguete and Vigarny, schools of painting and sculpture that Florence might have been proud to own. The odes of Fray Luis de Leon were excelled in strength and grace by none ever recited at the court of Ferrara, and pastoral Estremadura could boast a painter—Morales of Badajoz—not unworthy to cope with Sebastian del Piombo on his own lofty ground. During the reigns of the three Philips literature and art kept an even pace in their rapid and triumphant march. When Juan de Toledo laid the foundations of the Escorial, Cervantes was writing his early poems and romances in the schools of Madrid. The versatile Theotocopuli was designing his various churches in and around Toledo, and embellishing them with paintings and sculptures, whilst Lope de Vega was dashing off his thousand dramas for the diversion of the court. Mariana composed in the cloister his great history of Spain, whilst Sanchez Coello, the courtier and man of fashion, was illustrating the story of his own times by his fine portraits of royal and noble personages. In the reign of Philip III. Velasquez and Murillo were born, and the great novel of Cervantes first saw the light. Solis and Villegas, Moreto and the brothers Leonardo de Argensola, famous in history, poetry and the drama, were contemporaries of Ribera, Cano and Zurbaran, and with them shared the favour and patronage of the tasteful Philip IV. When Velasquez received the cross of Santiago, Calderon was amongst the knights who greeted the new companion of that ancient order. In the evil days of Charles II. Spain and her literature and her arts drooped and declined together. Painting strove the hardest against fate, and was the last to succumb. Murillo and Valdés, Mazo and Carreño and their scholars nobly maintained the honour of a long line of painters till the total eclipse of Spain in the War of the Succession. With the House of Bourbon came in foreign fashions and foreign standards of taste. Henceforth Crebillon and Voltaire became the models of Castilian writing; Vanloo and Mengs of Spanish painting. From the effects of this disastrous imitation painting, at least, has never recovered.

International Relations of Gothic.

The Gothic architecture of France is the elder sister of our own, and, if not more beautiful, possesses beauties and varied expressions of its own, which must ever secure to it the earnest love and devoted admiration of every student of Mediæval art. Our own architecture can hardly be correctly understood without a knowledge of that of France. Their origin, development and history are so linked and entwined together that without the knowledge of both they cannot be fairly studied or appreciated. France, too, took the first place in art, as in arms, amongst the nations of Mediæval Europe. Her art productions may therefore be viewed as the normal types of Gothic architecture, and there is a boldness and nobility of treatment about them which especially commends them to the most diligent study of the architectural student and workman. The Mediæval architecture of Germany and of Italy has claims only second to those of France. The period claiming the greatest amount of attention, at least in Northern Europe, may be roughly said to embrace two centuries, viz. the great thirteenth, and a moiety of the preceding and succeeding centuries; that is to say, from A.D. 1150 to 1350. Earlier and later periods must be fairly represented, but this interval contains the real vigour, the pith and marrow of Mediæval art. Mediæval architecture demands, however, for its elucidation that certain styles which preceded it and from which it drew its first inspiration should also be duly illustrated, such as the Byzantine and the Italian Romanesque, each including the branches by which it was led through other countries, and especially through Germany and France, with the changes it underwent by the way. The influence of Byzantine art upon the architecture of France in the twelfth century was direct. The foliage and the figure-carving, so well known in the earliest French Pointed-works of the latter half of that century, are for the most part directly derived from Byzantine carving and drawing, with a certain degree of influence from Italy, which was herself drawing freely upon Byzantine art. It is clear, therefore, that to illustrate Mediæval architecture properly we must possess ample specimens of these its parent styles.

The Vicars' Close, Wells.

The vicars choral formed part of the original establishment of Wells Cathedral, and were incorporated by Bishop Joceline in the beginning of the thirteenth century; and as he was a great builder it is probable that he built houses for them; but all that we have remaining of his time are some fragments of beautifully-sculptured ornament used up as old material, and built in the spandrels of the arches of the windows and in the parapet. These correspond exactly with his work in the cathedral, and with the remains of his palace at Wookey; but they may have been brought from some part of the cathedral now destroyed, and the original vicars' houses may have been of wood only, as was very usual at that period. These were rebuilt by Bishop Ralph, of Shrewsbury, in the fourteenth century; and he expressly mentions in his will the houses that he has built for the vicars, but all that remains of his work is the hall, with its west window and side windows. The east end over the gateway was lengthened in the time of Henry VIII. by Richard Pomeroy. The present houses were entirely built or rebuilt by the executors of Bishop Beckington, late in the fifteenth century, on one uniform plan, and several of these remain nearly perfect, though in many cases they have been altered, and two houses thrown into one. Nor can we complain much of this when we remember that the houses were originally intended for bachelors only, and each consisted of two rooms with closets at the back, but no offices. The vicars dined together in their common hall, and required no kitchen in their houses. The Close was, in fact, a college, in which each student had a small house, instead of his two rooms in a large one. The very beautiful gatehouse and bridge over the road from the vicars' hall to the cathedral is part of the numerous works of Bishop Beckington, one of the greatest benefactors of the city.

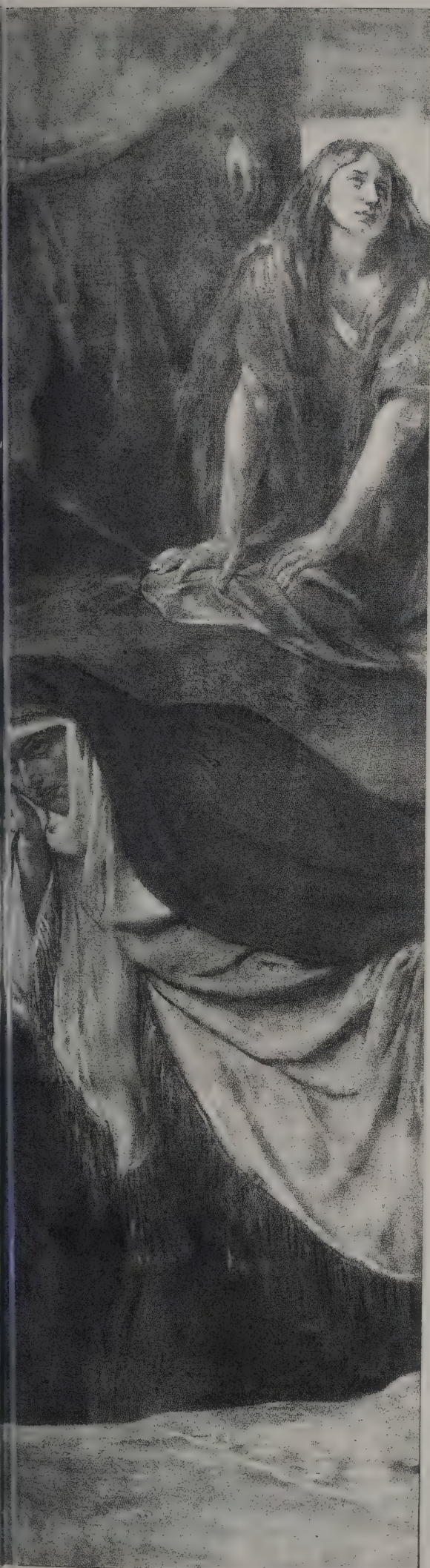
Paper Hangings.

These works may in some respects be divided into two classes—paper hangings proper and pictorial decoration. As regards the first of these the general principles are simple and obvious; large surfaces should always be quiet and unobtrusive in order to maintain that breadth and repose which is requisite, and should only be much enriched at the borders and edges, as, for instance, in the mouldings of the cornice or dado, or, as was formerly the case, and is now again practised, by means of those borderings which are manufactured for the purpose. The patterns of paper hangings, therefore, should be subdued and proportioned to the size of rooms; the colour should be rather inclined to negative than positive, to tints or shades rather than to full hues, and should be so equally distributed as to avoid violent contrasts, which rule will apply to the forms also; these should be treated flat and not in imitative relief. These rules are necessary to be observed to render the walls a background and subordinate them to the objects in the room, whether it be the furniture, the art or the occupants themselves. In addition to this, there requires such a variety both for colour and pattern as will admit of a suitable choice for aspect or for situation, so as to carry out or be in harmony with the other furniture. These conditions observed, the ornament may consist either of abstract forms or of floral adaptations. With regard to the second division, pictorial decoration, the more works are exclusively of this character, the more complicated and pictorial they are, the more unsuited they become for reproduction by machinery, and often the more distasteful when so produced. Too common at the best to be looked on with pleasure as works of art, they are impertinent and obtrusive in use, only fit for salons, cafés and such places where the meretricious supersedes the beautiful. It is desirable that these works should be separated by a wide interval from the former, and that great care be taken that the pictorial principle of the one does not interfere with or supersede the strictly ornamental principle of the other, since they have or should have nothing in common.

Copyright in Engravings.

In 1819 Mr. J. O. Robinson purchased the stock of the late Messrs. Boydell, and, in connection with Mr. Hurst, carried on the business of print-sellers and publishers. In May 1822 they entered into a written agreement to pay Sir Thomas Lawrence 3,000*l.* per annum for the exclusive privilege of having plates engraved from his pictures. Among the projects of Messrs. Hurst & Robinson were the portrait of the Duke of York and the two children (called "Nature"), engraved by G. T. Doo; the "Little Red-Ridinghood," engraved by Lane; and the portrait of George IV., engraved by Finden. For the privilege of engraving these, and two or three other subjects which were never finished, all from the pencil of Sir Thomas Lawrence, Messrs. Hurst & Robinson paid that distinguished artist 10,000*l.* Wilkie received 1,200 guineas for the picture of "The Chelsea Pensioners," painted for the Duke of Wellington; and 1,200*l.* from Messrs. Moon, Boys & Graves (who, after the failure of Messrs. Hurst & Robinson in 1825-26, purchased their stock), for the privilege of having the print engraved from it.





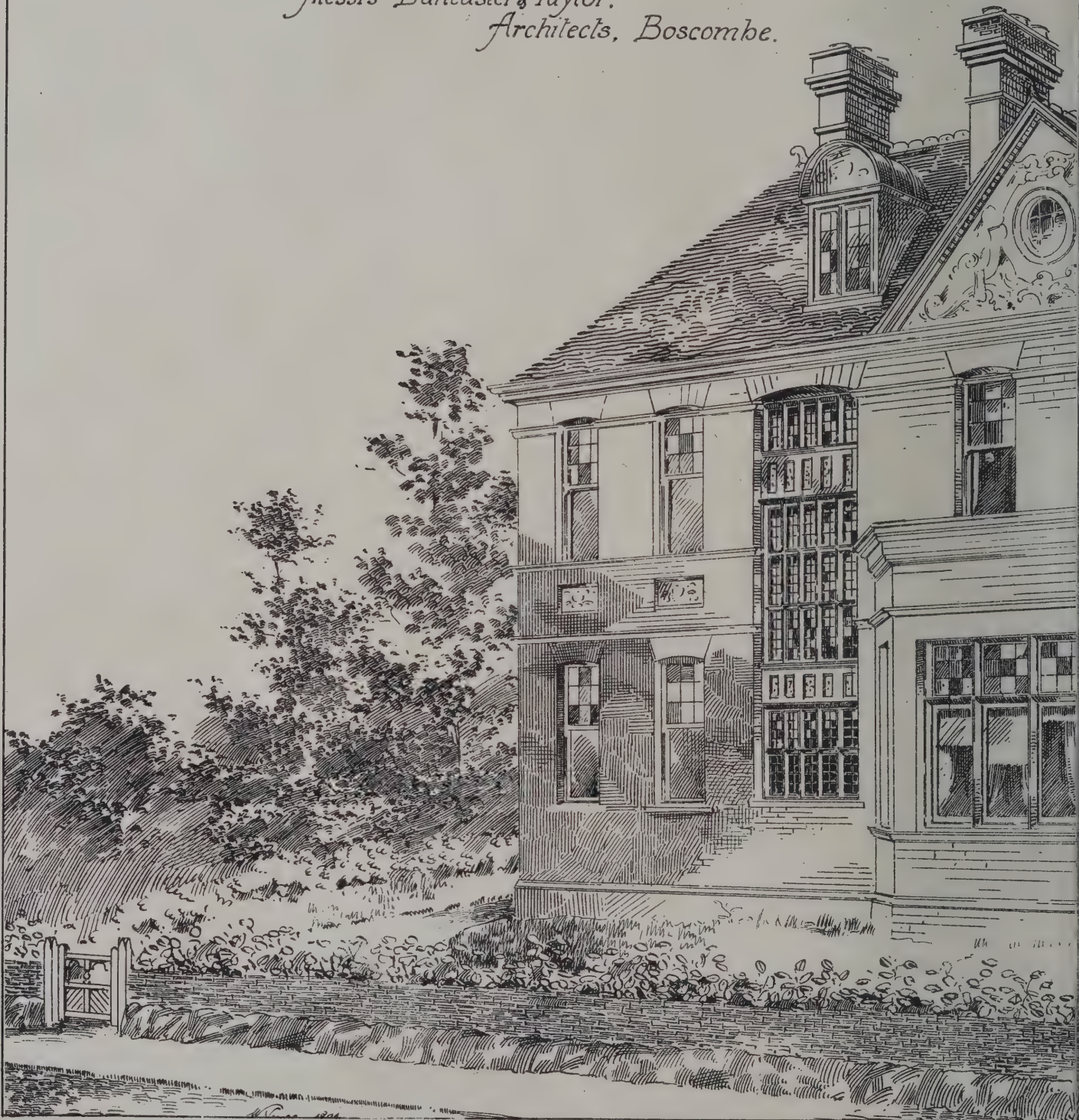
POPULACE RETURNING FROM THE MARKET
A STUDY IN GROUP
BY THE LATE JEAN LEON



THE
POPULACE RETURNING FROM MOUNT CALVARY.
A SCENE IN THE BIBLE.

VILLA RESIDENCE - STOURWOOD.

*Messrs Lancaster & Taylor.
Architects, Boscombe.*



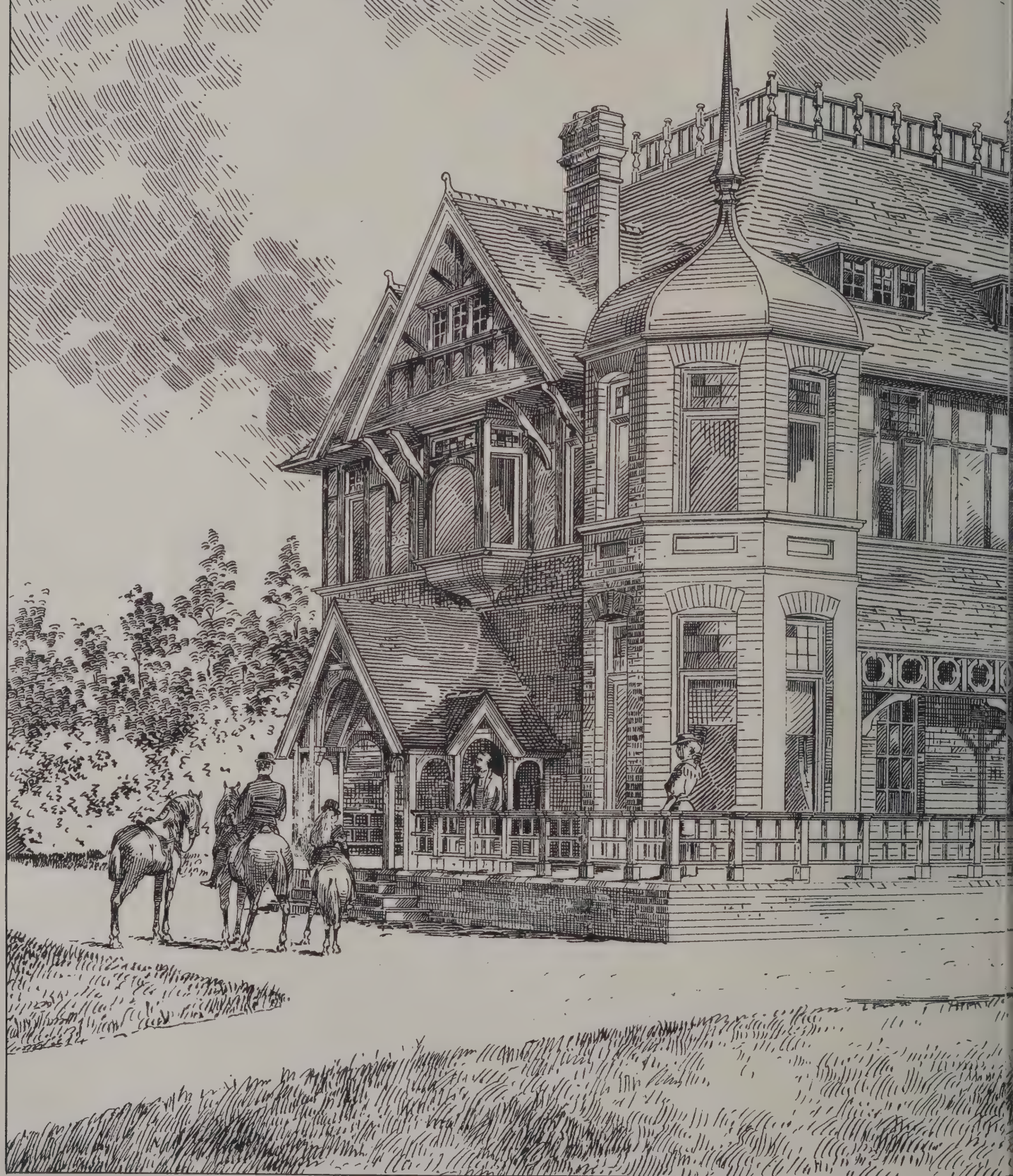
Feb. 22nd 1895.



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THE GORDON HOTEL.
BOSCOMBE.

Messrs Dancaaster & Taylor.
Architects.





ILLUSTRATIONS.

THE RETURN FROM CALVARY.

THE study we publish is one which the artist, the late JEAN PORTAELS, director of the Royal Academy of Painting, Brussels, considered to be among his happiest inspirations. The moment selected was supposed to be one immediately after the Crucifixion, when the crowd began to move towards Jerusalem. The subject allowed the painter to display the types of men and women he liked to paint, and the costumes which he most admired. Whether they were true to time and place is another question.

VILLA RESIDENCE, STOURBRIDGE.

THE GORDON HOTEL AND VILLA RESIDENCES ON THE STOURWOOD BUILDING ESTATE, BOSCOMBE, BOURNEMOUTH.

THE Gordon Hotel, now in course of erection on the Stourwood Estate, stands about 100 yards from the edge of the cliffs, and has uninterrupted views of Bournemouth Bay, Swanage, the Isle of Wight, &c. The site is about two miles from the centre of Bournemouth, and is beautifully surrounded by trees and shrubs of various kinds and growth. The Stourwood Estate, like the Bournemouth Public Gardens, is profusely studded with rhododendrons, and the roads on the estate are 50 feet in width, with pathways 10 feet wide, on which many trees are left standing and rustic seats interspersed.

The villa residences are among the first to be erected on this property, which was opened as a building estate at the latter part of last autumn, and which is now recognised as being the most charming and picturesque that has ever been introduced on the south coast. The villas each stand in their own grounds, and contain three reception-rooms, from seven to nine bedrooms and the usual offices, &c. The principal rooms in each house have a direct southerly aspect.

The hotel will be opened for visitors early in July next, and from the unequalled position in which it stands, will doubtless soon require extension. At present, however, there are but twenty-one bedrooms, and the public and private sitting-rooms range the whole of the south front and overlook the sea. There is also a spacious and well-appointed billiard-room to the hotel, extensive tennis-lawn, &c, and stabling in the rear of the grounds.

The whole of the buildings have been designed by Messrs. DANCASTER & TAYLOR, architects, Boscombe, who are surveyors to the estate, and in addition to their superintendence, the buildings will be under the supervision of the Christchurch sanitary authority, by whom all plans, sewers, and method of drainage have been approved.

CANTERBURY CATHEDRAL.

THE Dean and Chapter of Canterbury Cathedral and the representatives of the consistory of the French Protestant church in the crypt have at length come to an understanding as to the removal of the French church into the Black Prince's chantry. A considerable minority of the consistory, eight out of eighteen, are, however, strongly opposed to the removal. The floor of the Black Prince's chantry lies on a level some inches lower than that of the French church, to which at present it stands in the position of a vestry and vestibule combined. The minority urge that, in consequence of this, the chantry is always flooded in time of heavy rain. They also fear that if they submit to be ousted from that portion of the crypt to which they are entitled under a charter of Edward VI., it may be only a question of time before they are expelled from the cathedral altogether. The Bishop of Dover is, it is said, in favour of this course. However that may be, there is among the minority of the consistory an extremely bitter feeling against the Dean and Chapter, more particularly against those of the canons who are believed to hold more or less extreme Anglican views. At one time the Wallons occupied nearly the whole of the crypt. They used the greatest part of the large westward portion for their schools, for meetings and for practice in singing, but the assertion that they worked at their looms in the crypt appears to be incorrect. The feelings of the present

minority are thus naturally embittered by the recollection of their predecessors' prosperity. The removal to the Black Prince's chantry may now be considered inevitable, but before it takes place the chantry ought to be properly secured against floods, and the coats of whitewash and dirt which now conceal the colouring of the vaulted roof should be removed. When the portion of the crypt now occupied by the French church was restored as a memorial to Archbishop Tait, the beautiful Norman pillars and arches were painted all over with meaningless patterns in primary colours. The Black Prince's chantry should be protected against the risk of similar vandalism in future.

DURHAM CATHEDRAL.

IN a letter to the *Times* Mr. C. Hodgson Fowler writes:—

The interest taken in the recent discoveries in Durham Cathedral makes it desirable that some fuller account of them should be given, and with your permission I will do so, especially as in the report published in your columns of the 1st inst. there are several inaccuracies.

The excavations were begun with a view of ascertaining the nature and depth of the foundations of the present building and of the ground between them, and were purposely commenced at the junction of the Norman aisles with the Early English work of the nine altars; and the foundation-wall of the southern apse was then uncovered.

The existence of such termination to the aisles had always been a doubtful question, though Dr. Raine in his "Saint Cuthbert," written in 1827, gives a sketch plan showing them, but nowhere, as far as I know, gives any authority for them.

But he mentions that in the previous year the foundation masonry of the central apse was ascertained to be in a perfect state.

Of this apse we have now laid bare more than half the inside plinth, with one of the projecting blocks for carrying the vaulting shafts, and one base of a wall arcade precisely similar to the arcades in the choir aisles.

The exterior of the apse wall has been completely cut away by the Early English arcade round the feretory, but the existing remains show clearly that the apse was not surrounded by an ambulatory, but followed the plan of many familiar apses in Normandy.

But the foundations discovered of the two side apses present much greater difficulties as to their original date and design. They are both of roughly-hewn masonry (the ashlar mentioned in your account being Early English work built partly on the southern apse) and go down to the rock, which is 11 feet below the present floor-line—not more than 20 feet, as stated.

They are both about 9 feet 9 inches in diameter, and extend about 9 feet eastwards from the present inside termination of the Norman aisles.

The southern one is exactly central with the aisle, and at first sight seems as if it must have been part of it, but the centre of the northern one is some 6 inches north of the centre of that aisle, and therefore could not work in correctly with it. Eastward of each we have found a foundation wall running north and south at a distance of about 13 feet from the inner face of the apse.

Now as the walls of the choir are about 7 feet thick, and those of the aisles 5 feet 6 inches, it seems unreasonable to suppose that the eastern walls of the apses were made more than double the width of their side ones, and therefore these transverse walls must be taken as being of a different date.

Then the Norman walls of the aisles and of the triforium above are carried on in straight lines 14 feet to the east of the apses, showing clearly that Carilef's work did not terminate with them, as has been surmised.

But if his aisle walls were returned north and south on the line of the above-mentioned transverse foundations, they would give a square-ended chapel at the east of each aisle, with probably a low tower over each, judging from various indications in the upper part of his walling.

This would give an east end to the cathedral of great dignity, a bold semicircular central apse projecting from the east gable of the choir and flanked by two towers.

The question of the side apses still remains unsolved, and I venture to suggest that, as was at first thought, they are part of the foundations of Aldhun's church, probably of two apsidal chapels opening out of transepts. This would suppose a cruciform church with a somewhat short eastern arm, but which would be long enough to enclose the shrine of St. Cuthbert, placed where his grave now is.

And this theory would account for the removal of his body from Aldhun's church to the temporary "Tomb of stone in the Cloyster garth," which would have been unnecessary had not Carilef's church been designed to stand on the exact spot so long hallowed by the body of the saint.

ANTONIO CANALETTO.

WE noticed lately M. Moureau's "Antonio Canal dit le Canaletto," which forms one of the series of "Artistes Célèbres," published at the Librairie de l'Art, Paris, and printed some of the illustrations. We are now enabled to add a couple

Canareggio with the Canal Grande, is an eighteenth-century building and was designed by Carlo Corcellini. More interesting in the eyes of Canaletto was the Palazzo Labia, containing frescoes by Tiepolo, who used sometimes, it is said, to paint the figures in Canaletto's views of Venice.

The other view is reduced from one of Canaletto's etchings.



THE CHURCH OF SAN GEREMIA AND ROYAL CANAL, VENICE.

which show the difference between an engraver's works and an artist's etching.

The view of the church of St. Geremia is after one of Visentini's engravings, and, like his work in general, it manifests a desire to be faithful to the paintings. There is not much chiaroscuro, but if effects of the kind obscured the architectural lines they are better away. The weakest part is the sky. The church of St. Geremia, which stands near the junction of the

It is not exactly in the style with which his name is associated, for it cannot be called an architectural scene, but the buildings that were before him, although of little importance, were rendered faithfully. The plate explains the secret of Canaletto's success; he never sacrificed reality for the sake of picturesqueness. In other etchings he allowed himself a more dashing manner, and they are as free and unlaboured as could be desired, but the view given is more characteristic of his best manner.

SOCIETY OF ARCHITECTS.

SOME seventy gentlemen, mostly members of the Society of Architects, dined together last Tuesday night at St. James's Hall, Piccadilly. The chair was occupied by Mr. E. J. Hamilton, the president.

The loyal toasts having been given from the chair and

to be built, there were many to be restored, and perhaps he might be allowed to add that there were some to be re-restored, and we should all deeply regret if the material wants and resources should cripple the efforts of those who, up to the present time, had done so much.

Archdeacon Farrar, in replying, said the greatest triumphs of architecture had been wrought in the service of God, and



VIEW NEAR VENICE. (From an Engraving by Canaletto.)

heartily acknowledged, Mr. G. Candy, Q.C., gave "The Houses of Parliament," which was replied to by Mr. Atherley-Jones, M.P., who said it had fallen to his lot to promote a Bill in Parliament for the compulsory registration of architects, and that measure had that night received its first reading, and he hoped that he and those who had backed the Bill would be able to get it further considered in the present session.

"The Clergy of all Denominations" was given by Sir F. Jeune, who said there were many churches in this country still

throughout its entire history architecture had been the hand-maid of religion.

"The London County Council" was given by Professor Banister Fletcher.

Mr. Bassett Hopkins, who replied, defended the policy of the Progressive party.

Mr. Wyke Bayliss proposed "The Society of Architects and Architecture," which was acknowledged by the President, and other toasts followed.

DRAWING FOR PROCESS REPRODUCTION.*

THE title of this paper irresistibly reminds me of the knight's song in "Alice in Wonderland," which, as no doubt you remember, was called "Haddock's Eyes;" but that was only "what the name was called;" its real title was "A-sitting on a gate." In the song itself there is nothing whatever about gates or even about sitting. Now the name of this paper may be called "Drawing for Process Reproduction," but what its title should really be is quite another matter; perhaps later on a more reasonable description may suggest itself.

One of the most painful moments in the life of an expert is surely when he is introduced to a stranger, who immediately proceeds to instruct him in the mysteries of his own craft. It is like being retold a good story by the man to whom you told it. Politeness demands silence and apparent attention, but after a time the restraint becomes intolerable. As the elementary details are being more or less inaccurately told you, or the story is deprived of its point, you feel that the strained situation might supply a question of manners for a competition in a society paper.

Starting with idea of bringing together practical hints in the preparation of drawings for process reproduction, I soon saw that to do so would put me in the position of the superfluously garrulous outsider, if I attempted to expound first principles to masters of both crafts—that of drawing for reproduction and the reproduction of drawings, which are implied by the title of the subject for this evening.

The records of the Society of Arts are full of most instructive papers on Illustration in all its bearings. In the past Mr. Comyns Carr, Mr. Carmichael Thomas, Mr. W. J. Linton and Mr. Walter Crane, to name a few, all admirably equipped for their efforts, have delivered most excellent lectures. Only lately we had the pleasure of hearing Mr. Horace Townsend discourse on a branch of this subject, and still later, Mr. Henry Blackburn in a series of Cantor lectures covered the whole ground, or as much of it as any man could hope to do in a given time. Therefore, feeling it would be folly to attempt to traverse the field so thoroughly worked, all I can hope to do is to suggest a few side issues, which may provoke controversy far more valuable than anything I can say.

For, new though the art of reproduction by process is, it is already diverging into a hundred channels, and has its dogmas and its schools—as diametrically opposed to each other upon vital questions as could be found in any subject an Englishman deems worthy his attention. Not merely do artists differ on results, they are by no means agreed on methods—not only do craftsmen squabble over details, they fail to unite on matters of the first importance.

Roughly speaking, those interested in "process-work" may be divided into two camps—those who believe that nothing can be produced to-day better than the work of past centuries, and holding the ideal of the past to be unassailable, regard any attempt to modify it as flat blasphemy; and the other school, who, believing that altered conditions imply amended ideals, would fain open their eyes to all the defects of modern methods, not to condemn them merely, but to discover, if possible, ways to improve and perfect them.

It would be hard to think of any artistic topic with ideals more widely separated than, say, the Kelmscott Press edition of Chaucer, with its hand-made paper—archaic ornamentation and antique type symmetrically disposed on its pages—on the one hand and the latest French or American *édition de luxe*, with its shiny paper, its fine woodcuts, or half-tone blocks and its erratically arranged page, with illustrations splashed here and there, straying into the margin and at times in pale shades, wandering underneath the type itself.

One is forced to own that the conditions of modern printing—especially those that concern the periodical press—forbid a return to what we may conveniently call the Kelmscott manner. We may prize it as the perfect representation of an ideal that was achieved when printing was a fine art, and regret that for the future it takes its place with the arts that appeal to the classes rather than to the masses. For the attempt, excellent as it is, seems foredoomed to follow a not dissimilar effort to revive Gothic architecture in our daily life. We all know how, a generation ago, the casement and the sash window, the pointed arch and the square lintel, the interior of unadorned brick, with open timbered roof, and the plastered walls and ceiling, fought for the mastery. The rows of so-called Gothic villas in our older suburbs cease to charm us to-day, their spikey fascinations tempt in vain. The ugliest Georgian house satisfies us more because we see how an arbitrary attempt to adapt the externals of the surroundings to a past style was beginning at the wrong end, and that, after all, the art which accords most easily with the conditions of daily life and the needs of the average citizen is more likely to enshrine whatever art may be floating in the air at any period, than a deliberate

attempt to be artistic in uncomfortable or archæological ways.

The conditions of our time, requiring as they do rapid production and large numbers of impressions, with lavish illustrations, not merely of artistic but everyday subjects may be deplored, but it is wiser to recognise their supremacy. It does not seem disloyal to the ideal which ruled in the fifteenth and sixteenth centuries to accept machine-printing and process-blocks any more than it is acting disrespectfully to Westminster Abbey to live in a house with gas, electric bells and as much common comfort as the jerry-builder will give us.

Instead of trying to raise illustration by retracing our steps, and trying to be imitative fifteenth century—endeavouring to make a system which sufficed for a simple civilisation work under quite new conditions—would it not be better logic to accept machine printing, shiny paper, the process engraver and his works, and by mastering these new conditions—as the artist most assuredly can master any conditions if he set his mind to the effort—to create new ideals and set up new standards of taste and beauty? Possibly to do so must be to give up certain forms of expression very dear to many of us. We are the most sentimental nation under heaven. We prize ancient faults far more than modern virtues. But there is something the reverse of despicable in fighting with circumstances. To create a new ideal of a perfect book, with its pages illustrated by modern methods, printed by steam-power and produced at moderate prices; to leave such a standard that future ages, removed from the strife of tongues to-day, should deem characteristic of the twentieth century, and beautiful because it fulfilled harmoniously the conditions which called it into existence, seems worth trying for—worth many failures by the way.

For can anyone declare that the art of illustration, or, indeed, any art was the secret of any one age? What we do see is that the innovator banned by some of his contemporaries, who clung to past tradition, has often survived when the orthodox imitators of earlier ideals have ceased to be reckoned of any account.

To-day we are in the full swing of process reproduction, so much so that wood-engraving seemed but lately to be dying out, except perhaps in America, and in a few instances where artists such as Timothy Cole, Ellbridge, Kingsley, Charles Shannon, Charles Ricketts and a few others engraved their own blocks. Yet the last few months have witnessed a notable effort to bring it back to popularity in France and England; with that, however, we are not concerned to-night, but with the reproductive photographic methods for typographic printing. Of the various processes employed in book and periodical illustration to-day, there are, roughly speaking, two classes which are in general use—line work, for direct reproduction, and "half-tone," for the reproduction of wash drawings. The first, spoken well of by all men; the latter, a by-word, a thing for every critic to jeer at.

Taking the simpler process first, "to draw in solid black lines upon smooth white paper" is still the popular advice of the process man to the artist. His aim is naturally to get a drawing that will reproduce easily, and yield a faithful result without undue pains. Add to this a protest against too great reduction, a caution against employing parallel lines too close together, or isolated fine lines which will inevitably thicken, and, above all, a warning never to use grey lines—such as an exhausted pen is apt to yield, with many varieties of ink—and one feels the whole of the popular teaching on the subject is included. On the other hand, the pen draughtsman, eager to obtain more subtle effects, is inclined to rebel against these restrictions, to demand the freedom of using grey lines, and to mix up pencil touches with ink, if he be so inclined. Indeed, some artists seem to feel their one aim is to set the engraver a problem full of difficulty, and bid him improve on the effects they desire. Looking askance at both artist and engraver, the publisher is apt to draw a hard and fast line of so much "per inch," and to grumble at any overcharge; so the triangular duel between these conflicting interests is fought daily in many offices.

It is hardly necessary to go into these three sides of the subject here; indeed only an expert quite sure of his own position could exploit any one aspect of it adequately. Yet, leaving the debateable land where commerce and art are always struggling, one may claim that a new technique for pen-drawing has grown up of late years, which has so far had scant justice done to it by many critics whose ignorance of process is no excuse for the very unfair criticisms they offer. A pen-drawing may be excellent from the process man's point of view, and may so far imitate the style hitherto in vogue for woodcut to satisfy the older school of critics, and yet miss all the newer effects which are the joy of many students of the art. It is easy to dismiss the modern school as the work of a few geniuses who, by incessant practice, have become proficient—although it is a curious charge to urge to the discredit of a man that he is a genius who has taken infinite pains. Yet because it would be obviously foolish to advise any young artist to imitate the

* A paper read by Mr. Gleeson White on February 5 at the Society of Arts, in the Applied Art Section.

mannerisms of the style of any artist, we hardly solve the question by advising him to go back to the days of no style in particular, or by bidding him be content to imitate wood-engraving rather than to rely upon pure pen-drawing effects.

In drawing for process it seems necessary to warn beginners to shut their ears to most excellent advice of most worthy people of past days who were talking of quite another subject. Nor must reference to the splendid school of wood-engraving, which both the foes and friends of modern pen-drawing agree to praise, be held to constitute the final court of appeal. The drawings we think so admirable did not escape abuse from contemporary critics. Take the following passage, for instance, without its context, and it sounds like one of the furious onslaughts on our younger artists we meet not infrequently to-day :—

"The cheap popular art cannot draw for you beauty, sense or honesty, but every species of distorted folly and vice—the idiot, the blackguard, the coxcomb, the paltry fool, the degraded woman—are pictured for your honourable pleasure in every page, with clumsy caricature, struggling to render its dullness tolerable by insisting on defect—if, perchance, a penny or two may be coined out of the cockney's itch for loathsomeness. . . . These . . . are favourably representative of the entire art industry of the modern press—industry enslaved to the ghastly service of catching the last gleams in the glued eyes of the daily more bestial English mob, railroad born and bred, which drags itself about the black world it has withered under its breath. In the miserable competitive labour of finding new stimulus for the appetite—daily more gross—of this tyrannous mob, we may count as lost beyond any hope the artists who are dull, docile, or distressed enough to submit to its demands."

This diatribe, which had for its text the current number of the *Cornhill Magazine*, where Mr. Ruskin was writing, covers several pages of his "Ariadne Florentina," wherein he goes on to the conclusion that, "for total result of English engraving industry during the last hundred and fifty years, he was unable to get a single piece of true, select and comprehensive art to place for instruction in any children's school."

If, in 1876, the great art critic thought thus of the English school of wood-engraving we now appraise so highly, what matter if lesser men to-day regard the modern art of pen-drawing and process reproduction with somewhat similar contempt?

But this is only by way of warning to those who say that any cut-and-dried style of pen-drawing or woodcut has finally perfected a type for all successors. The man who has within him the instinct for drawing in black and white will ultimately find his own style, whether he employ the black blot of Vierge, the broken brush line of Japanese art, the finely-modelled lines of Marc Antonio, the attempt to work in pure line of one school, or an effort to give masses and values made up by lines unmeaning in themselves which distinguishes another.

If this most important question of style be too great to discuss, on the other hand it is not necessary to-night to go into details of the best ink, the most suitable papers, nor even to consider the important question of reduction—these things are excellently set out in many useful text-books. One man wields a brush with greater facility, another prizes a reed pen, another a Gillott, another a glass stylus—all these tools have their champions. But no one ever yet found the implement that insured a good result; that secret lies at the other end of the pen, in the hand and brain of the artist. It would seem obviously to the artist's interest to set down lines that experience tells him will yield the result he wishes. If, for special reasons, he wishes to obtain unusual effects, it is hardly fair to complain that the engraver is to blame should he not succeed at the first attempt to secure them. Some firms, as we know, take a pride in overcoming difficulties—which pride often flaunts its unwelcome presence in their invoices—others, bent on keeping down expenses, do the best within limits, and blame the artist for the failure. The game of setting problems for engravers, amusing to a cynic, is hardly so full of fun to the editor or publisher, who is not inclined to accord to all his contributors the attribute of genius, which rightly insists on making its own rules.

In face of all attack, one may venture to stand up for the popular illustrator, believing that, reviled by many, in high places of criticism to-day, his best examples will survive to attract the praise of connoisseurs of the future.

It was Mr. Pennell, I think, who said that "artists who show their work to the people through the press are doing as did the masters of other days, who spoke to the people through the Church;" and it seems no unduly sanguine prophecy to believe that of the best art we can produce to-day, a large proportion will be found in the popular publications of the hour. The same qualities that are needed for a good etching, which wears the purple of a recognised nobility, are required for what is even now considered its plebeian descendant, a good pen-drawing; but whereas in the etching the fat-inked line of the printer will give you even more than you expected, and, if you

are so minded, *retroussage* and other tricks may eke out the effects of your drawing, here we may be fairly sure that the first block, printed by the best process, will rarely, if ever, surpass the original. The actual relief of the ink on the drawing, slight though it be, is a very important factor, and this is not apparent on the smooth surface of modern books.

One could wish that for the sake of satisfying the eye, a method the reverse of hot-pressing could be adopted to destroy the shiny smoothness of the printed sheet to-day. Especially is this objectionable when the ink used has a lustre of its own, a metallic purple sheen which seems inseparable from some of the best half-tone printing. But although the decorative school can enjoy the luxury of hand-made paper, the artist of actuality the illustrator as distinct from the designer, may count himself lucky to get fairly good printing, even when he has accepted the inevitable smooth paper and the ink which produces the best results.

We all agree to consider the *Century Magazine* a typical example of excellent modern printing. In a conversation with Mr. De Vinne, he attributed its success, in great measure, to the American method of printing with a hard bed, so that the impact was almost a percussion rather than an impression.

Slow as English printers are to move out of their groove, there can be little doubt that both process blocks or fine woodcuts demand this style of printing, and that ultimately it will come to stay. Consequently, those who would control the coming fashion will hardly do so by holding aloof and resting content on the laurels of their old superiority in the days before process. If so, their power may slip into other hands, until we find the purely commercial ideal influencing the whole method. Therefore, it seems wise to warn artists against this certain change at no distant date, and to prepare them to face the American ideals, and do their best to remove its ultra-pretty features by working its methods on broader and more really artistic lines.

But although drawing by pen and ink is the chief method for the direct process, there are others which in capable hands can be trusted to secure most excellent results. Of course the clay boards, the mechanically tinted papers and similar devices can be most disastrously employed; but artists have before now—notably in the *Courier Français*, the *Chat Noir* and other French papers—not merely escaped disaster, but used these prepared boards or even the added tint—Day's shading medium—which was an offence to a recent speaker on this topic here, with admirable results.

A very safe way to insure accurate reproduction of a chalk drawing is afforded by using lithographic chalk on a sharp grain paper, not necessarily of extremely coarse texture. The oily nature of the chalk seems to prevent those lighter touches which yield greys in the original, and in the block either disappear or come out solid blacks—in either place to the detriment of the work.

With this facsimile chalk-work great reduction is undesirable, as the dots (shown by a powerful magnifying glass), clear and distinct, which build up equally the lightest and the darkest tints, cannot be reduced without great change—they vanish or else run together in masses, either result confusing the intended effect.

Fine lines are hardly possible in this work, unless it is treated on a larger scale; but beyond giving a mixed result not always pleasing, there is no mechanical objection to added touches by pen or brush that will supply those sharper accentuations of forms which are very hard to secure when working with the comparatively blunt point of this lithographic chalk upon rough paper.

To give an artificial grain to a smooth paper, some draughtsmen have worked with chalk upon a thin, hard paper (not unlike that used by typewriters), laid over a very rough piece of "Whatman" or the cloth cover of a book. You all know how easily a pencil-rubbing of the pattern upon a cloth binding may be taken; in this case the grain of the cloth is relied upon to break up the lines. The advantage consists in the fact that when the finished drawing is pasted upon a smooth board the surface offered to the camera is smooth. Only those who have had much practical experience of drawings and blocks can realise what an enormous difference this apparently secondary factor has in the result. The ordinary shiny and unattractive silver-print photograph and a platinum-type or bromide, which people, who know no better, call an art photograph, give quite different results, greatly in favour of the silver print. The same principle obtains with the smooth paper.

Another form of direct work may be produced from drawings made literally upon the photograph itself, upon a special print made upon salted paper. When the drawing is blocked in, the photograph is blacked and finishing touches are added. For work involving much fine detail—especially with complicated perspective—of such subjects as interiors of florid buildings, or a group of houses seen in acute perspective, this method offers a legitimate aid to the illustrator, especially if he be working against time.

Other tricks, such as "splatter" work and the like, need not be mentioned. Of these it all depends who uses them. Nothing is heterodox to an artist; he makes the meanest things obey his purpose. Everything, however, justified by precedent, is capable of being used offensively in non-artistic hands.

It would serve no purpose here to go into technical details, to consider, for instance, to what extent cross-hatching is desirable. Personally, it seems to me, if used to imitate the method so frequent in debased wood-engraving, it is undesirable. Indeed, for the freer art of pen-drawing for process, to bind itself within the limitations of the older methods is obviously absurd.

With regard to "half-tone," we find "process" in its weakest and also in its most popular form. It is unquestionably beloved by the people to-day, and also barely tolerated by artists. Indeed, half-tone is the favourite object for attack by nearly all the exponents of the higher criticism, and it is a tempting subject for ridicule. The "moral pocket-handkerchief," as it has been called, with its flat, grey surface, its ugly, mechanical network, and its fatal facility for multiplying the cheap photograph from life—small wonder that it has become the scapegoat of photography against whom every man's hand is raised. When one studies the blocks that illustrate the dozens of Academy guides and special supplements, especially those printed in pale shades of violet, green and magenta, one feels the only advice to offer to those about to draw for half-tone reproduction is the classic "Don't."

Yet here and there we find blocks quite as good as those produced by the imitative school of wood-cutting that preceded them, which were employed freely in America, and jealously admired here but a few years ago. As the half-tone engraver to-day is equal to anything you can offer him, one need not say much of the preparation of drawings for this class of block, beyond a warning that as the white network has a trick of lightening the darks, and lowering the lights of the original—that it is wise to draw in a more violent key, with exaggerated contrasts of lights and darks. It is advisable also, now that the camera registers too faithfully any alteration of colour, that the same pigment be employed throughout the drawing, whether it be in oils or water-colours; otherwise, if black and dark brown are used together with dead white and blueish white, the block resulting will record these shades which the artist only intended to appear as different "values," not as different colours.

But the half-tone block at its best may be left to confound all its detractors. On the walls here is a reproduction of a photograph of a carved wooden altar-piece, by the Swan Engraving Company, which not merely surpasses any woodcut, but beats the most perfect platinotype photograph for strength and delicacy combined.

The tone-block as it leaves the process-worker's hands seems to have reached its limit, and for advance we must look for artistic development in the added work of the graver. Now, handwork upon the block until quite recently has merely added fresh horrors; the cut-out backgrounds white, with the figures in harsh, untidy silhouettes against them, the coarse white scratches and the patchy effect of the engraved work upon the etched has been preposterously absurd. Here is an amusing example of the touched-up block and the untouched.

The remedy appears to be in the artist's hands; he must learn to use the graver, himself working on his block, as some artists—Mr. Harry Furniss for one, I believe—do to-day. Then he might reasonably prepare his work accordingly, and leave certain details for after touching up. For instance, the hair of figures might be left in a mass of black, or certain shadows put in with solid washes, the white lines to be added afterwards. It is quite easy, I believe, at a particular stage of half-tone to burnish down the white network in given parts, and to leave in their place solid blacks.

Judiciously employed, these masses often give vigour to a block, and whether prepared with a view to lightening by hand-work or deliberately planned as solid masses to stay, there can be no doubt as to their value in certain cases.

The mania for great reduction is possibly nearly exhausted, and one can only hope it will never revive. A specious prettiness and preciousness it had, but the temptation it offered to slovenly drawing and its forlorn dependence on the printer to redeem the result from being a mere muddled smudge, would alone suffice to condemn the practice. When a drawing the size of half a page of the *Times* was reduced to the dimensions of a postage stamp, the *reductio ad absurdum* was surely complete. Yet if report be true, many of the vignettes that illustrated the popular series wherein "Tartarin" and "Madame Chrysanthème" appeared were subject to some reduction. The dainty little woodcuts which seem to be in imitation, or at least in rivalry of process, by Florian and others, such as have been appearing in "Le Bambou," show a new departure probably destined to be highly popular. For myself I fail to see that they are a great advance on the best half-tone. They certainly appear to print better, and at first

there is a charm in finding the lines of the drawing full of interest in themselves, but after all they are the engraver's lines and not the artist's. True, in the best instances they may be even better than those the artist put down; but one may be sure that, once the game becomes widely played, the second-rate engraver, the mere mechanic, will cut away the refinement of the artist's drawing, as he chopped it out of existence in former days.

(To be concluded.)

THE ALABASTER INDUSTRY.

AN interesting report on the Volterra alabaster industry has been prepared for the Foreign Office by Vice-Consul Carmichael, from which we take the following:—

In 1893 only about 250 travellers—persons, that is to say, bent on seeing the sites and antiquities of the place—visited Volterra, sixty-nine of whom were English or American, forty-four Germans, thirty-nine French or Swiss, and the remainder Italian. And yet Volterra is a city that every English school-boy—thanks to Lord Macaulay—has heard of, nor would any history of the world be complete without some account of the part she has played.

The city of Volterra is of immense antiquity and its origin is lost in obscurity. But it can with some show of probability be demonstrated that it was in existence nearly 4,000 years ago, and it would seem safe to accord its alabaster industry an almost similar antiquity. Volterra was one of the twelve cities of the Etruscan League. In its Etruscan days the population of the city must have been quite 100,000, and the huge cyclopean walls which surrounded it had a circumference of 7,965 yards. Portions of these walls which still survive are of a height of 40 feet and a thickness of 13 feet. The southerly side of the town forms a line with the site of the ancient walls, and it thus happens that one of the original Etruscan gates which is standing, the famous "Porta all' Arco," forms also one of the entrances to the modern city. The local museum ("Museo Guarnacci"), a model of good order and perspicuous arrangement, contains nearly 600 Etruscan cinerary urns of curious and beautiful workmanship. Fully two-thirds of them are made of alabaster, and are thus a convincing witness to the time-honoured antiquity of the alabaster industry. Indeed, the whole city is still redolent of Etruscan traditions and Etruscan influences, and it would be impossible rightly to comprehend the modern industry without to some extent bearing in mind its venerable origin.

The country round about Volterra is bleak and desolate, but has a certain savage grandeur that is not unimpressive. Low bare hills and hillocks of clay, deeply fissured by the strong rains and with few perceptible traces of culture, lie around for a considerable distance. It has been well described by a picturesque and observant writer as "a region which . . . looks as if the waters of the flood had here subsided in violent agitation, the hand of man never having touched it since; hills of clay, whitened and cracked in the wind, without a sign of verdure or blade of grass, save here and there a twig, parched to the colour of dry mud, of which it was an abortion." It is in the midst of such country as this that the Volterra alabaster abounds.

Speaking generally, alabaster is to be found nowhere in the world outside the province of Pisa. Sweeping as this statement may seem, it will yet stand the test of examination provided there be no verbal misunderstandings. Oriental alabaster, the alabaster of the Bible, which is chiefly found in Egypt, is not what is nowadays ordinarily understood by alabaster, but is really a species of marble; it is a carbonate of lime, whereas the alabaster of Volterra is a hydrated sulphate of lime, a distinction sufficiently emphatic to mark the sharp difference between the two. Then the alabaster found at St. Jean de Maurienne, in Savoy, is alabaster only by courtesy, for it is said to be of so poor a quality as to be only fit for conversion into plaster-of-Paris. The so-called Derbyshire alabaster is of much superior quality to the French, and it is even worked into ornaments and used in altar decorations, but it would seem to be so far inferior to the alabaster of Volterra as not to merit classification in the same category. Other sources of alabaster or alabaster-like substances might be indicated—Rellsthal in Tyrol and Bormio in Lombardy, for instance; but here again the poor quality of the mineral or the insignificance of the quantity leaves Volterra without any appreciable rival. The alabaster of common parlance is, then, solely and exclusively the alabaster of the district of Volterra and other outlying districts, all within the province of Pisa. Stress is laid upon this fact because it is important, as it is also interesting, to show that the rough material of an industry of world-wide celebrity and world-wide diffusion is really confined within a very limited corner of one particular country of the globe.

There are many different kinds of alabaster found in the

whole district—Dr. Targioni Tozzetti, writing one hundred years ago, has elaborately described fifty-two varieties—but it will be sufficient for all practical purposes to divide the whole class into five clearly defined species.

1. The white alabaster of Castellina, a luminous and transparent stone of faintly cerulean tint.

2. The white alabaster of Volterra, a mineral of an opaque milk and even creamy white colour.

3. Veined, striped or spotted alabaster in its many fanciful and beautiful varieties ("Alabastro macchiato").

4. Bardiglio, a greyish stone of the nature of alabaster, which, when cut and polished, has something the appearance of the grey marble known as "Dove" in the English trade. This is the cheapest of the alabasters.

5. Agatised alabaster, called at Volterra agata, an extremely beautiful yellow stone varying in colour, when polished, from dark amber to deep rich brown. This is much the rarest and most expensive species of alabaster.

The Castellina alabaster is especially prized because of the large size of the blocks which are found. Nearly three-fifths of the alabaster for sculpture which is excavated at Pomaia is in blocks weighing at least over 6 cwt., while blocks of from 17 cwt. to 20 cwt. are of common occurrence. Indeed, Signor Ottaviano Ciampolini has this year sent to the Antwerp exhibition a block weighing 58 cwt., and having a length of 5½ feet. Such a find, however, is phenomenal.

The worked alabaster industry is divided into two strongly differentiated branches, firstly, sculpture, *i.e.* sculptured representations, whether on a large or a small scale, of the human form; secondly, the miscellaneous industry, *i.e.* the countless other objects manufactured at Volterra, such as vases, ewers, pillars and stands, baskets, clock-cases, frames, toilet necessities, animals, fruits, ash-trays, candelabra, crucifixes, holy-water stoups, &c. (Signor Pietro Volterrani's catalogue enumerates eighty-five different kinds of articles which may be purchased in his establishment.)

These two divisions of the worked industry correspond also with the two main divisions of the rough material, and coincide with the two territorial divisions that we have mapped out, for the alabaster used in what is called sculpture (alabastro da scultura) comes exclusively from the Castellina district, while the alabaster used in the miscellaneous industry (alabastro da industria) comes chiefly from the second and larger district. There is yet another point of division; nearly all the best sculpture of alabaster is now carried on in Florence, whereas the miscellaneous industry is almost wholly confined to Volterra city.

Walking along the by-streets of Volterra the ear is arrested by the clinking of little hammers or the grating rasp of files, and looking in at a doorway the passer-by will see two or three men busily engaged, with all the absorption of true artists, in fashioning the various parts of a vase or a flower-basket. These men may be a father and two sons, or an uncle and two nephews, or three men united in an informal partnership, or (very rarely) one man employing two others, and they usually unite in themselves the qualifications required in the production of a vase, one being a turner (tornitore) who gives it shape, the other a modeller (squadratore) who fashions its pillar and base, the third a decorator (ornatista) who carves its decorative adjuncts of fruit and flowers. The master-worker with his busy band of workers and apprentices has disappeared, and it is from these small workshops that the articles of the miscellaneous alabaster industry now go forth to the world. The workers sell chiefly direct to the proprietors of the Volterra "gallerie." A proprietor will bring a block of alabaster and a block of agata to the workshop and say, "Make me a vase and a stand out of these;" or the worker will purchase the rough material himself, fashion different articles and carry them to the "gallerie" on the chance of a sale. Then there is the waif and stray of the trade, often a mere youth, who lives a very precarious existence, buying a small block of alabaster when he has a few "soldi" to spare, working it into various articles and selling them, when he can, to the "gallerie" or to the chance traveller (a rara avis, as has been shown), or carrying them even, when times are very bad, to the neighbouring farmhouses, where he is glad to exchange his works of art for bread and beans and a little thin red wine.

The great cheapness of objects in alabaster—possible only by the hardy frugality of the workers and the low cost of living at Volterra—has tended to cast an undeserved slur upon the industry. So cheap are the smaller articles, that many people are led to believe that they must be produced in some way by machinery. The humble vendor who boards a British ship in Leghorn harbour, to display his wares, is often met with sceptic incredulity when he explains that all the articles he has for sale are the product of patient hand-made labour. How could existence be supported if such were the case, is the very natural question which occurs to those who have had practical experience of such offers? The writer of this report was offered for 4 lire, at Volterra, a small vase, an ambitious combination of alabaster and agata, which he would have thought

cheap at 15 lire, and its needy-looking maker reduced his offer to 2½ lire in the hope of doing business.

There are about 550 workers of alabaster in Volterra city. (Baedeker's estimate—two-thirds of the population—is nowadays quite beside the mark. "Central Italy," 11th edition.) The wage they earn would seem to Englishmen, ignorant of Italian frugality and contentedness, hardly sufficient to keep body and soul together. It is difficult to estimate with any approach to accuracy the value and the quantity of the worked industry of any one year. About 4,000 cases of goods are said to leave the city annually. The average weight of each case is 1 cwt.; the average value from 70 to 100 lire. It would not be to overestimate to fix the annual value at 15,000*l.*, and this figure should, perhaps, even be increased when the value of the sculpture done at Volterra comes to be taken into consideration. There are about half a dozen establishments in Volterra which merit the name of "galleria," among the principal of which are those of Signori Pietro Volterrani, Pietro Trinciarelli, Niccolò Biagini and the Società degli Alabastri.

Agata is mainly used for making pillars or stands for vases. The rich tawny yellow of this stone contrasts finely with a white or delicately-veined alabaster vase, the *tout ensemble* producing a most pleasing and artistic effect. It is also used, with an unfortunately misguided taste, as a decorative adjunct to small white vases and frames. The neck and handles of a vase, for instance, will be of agata, while the body is of alabaster, the result being, it is to be feared, essentially vulgar. Bardiglio shows to best effect in large vases of a free bold design, and it is not unpleasing in animals of fair size, as, for instance, a pair of lions or horses.

An artificial polish is given to all the articles of the miscellaneous industry. The object is first thoroughly rubbed and cleansed with shagreen and horse-tail ("equisetum sylvaticum"), and the final polish is given by the application with a woollen cloth of a paste compounded of bone-dust and common soap.

The sculpture of alabaster used at one time to be carried on principally at Volterra, but about twenty years ago this branch of the industry migrated to Florence, where it took root very firmly, and speedily assumed considerable proportions. Twenty years ago the caves of Signor Ferruccio Ciampolini used to furnish only 1,000 kilos. a year to Florence; they now send over 1,000 kilos. a day, a fact which sufficiently accentuates the revolution that has taken place in this branch of the industry.

There are six or seven important galleries in Florence, the principal of which are those of Signori Frilli, Lapini, Bazzanti, Vichi and Romanelli. All do a large export business chiefly with America and Germany, the Americans taking most of the modern sculpture, the Germans the copies from Classic models. Unlike the alabaster articles of Volterra, the sculpture is not subjected to a polish, but to a whitening process which is as follows:—The figure is immersed in water which is gradually raised to boiling-point, and then allowed to become quite cold again before it is taken out. Great care has to be exercised, as too much heat would reduce the alabaster to plaster, and a too sudden exposure to the air would cause it to crack. This process deadens the too great transparency of the alabaster, and gives it the appearance of fine white marble. The alabaster of Castellina is alone susceptible of this treatment; if tried upon white Volterra alabaster the result would be to give it the semblance of a plaster cast. Let it again be noted that Castellina alabaster, and Castellina alone, is used in this industry. It is now very generally coming to be called Castellina marble (marmo di Castellina), owing, no doubt, to the unreasonable prejudice against the idea of alabaster that exists among many people.

About 500 workers, including the sculptors themselves, are engaged in the Florence industry. Proprietors of the gallerie in giving a commission for the execution of a work used to provide the rough material. They now expect it to be found by the sculptors and workers themselves, who thus incur an additional responsibility. There are two depositories of the rough material in Florence belonging severally to the Brothers Ciampolini. From having to deal with six or seven large customers (the gallerie) they have now to deal with some hundreds of small ones, and their business has become in consequence much more elaborate and not a little irksome. A word of praise must be accorded to the good order and attractive arrangement of the gallerie. Each bust or figure stands upon a pedestal of pietra verde, bardiglio or agata with revolving top, and can thus be thoroughly and comfortably inspected. The establishments are of imposing dimensions. The value of the worked industry of Florence in the course of a year cannot be less than 20,000*l.*

Volterra, Florence, Leghorn and Pisa are the only cities of Italy where alabaster is worked. The industry at Leghorn has greatly declined owing in some measure to her disadvantageous position on the railway. Few chance travellers come to Leghorn, and the chance traveller is a very important factor

in the alabaster industry. But we still have the considerable studio and galleria of Signor Cesiano Vannetti, which is entirely devoted to the production of sculpture. Some twenty-five men are at present employed here and in a busy season the number of workers has been as many as fifty. The same style of work is done as at Florence. The copies from the antique are particularly good and fully equal to those of Florence. Modern sculpture is also done by Florentines specially transplanted for the purpose. The Leghorn sculpture being less famous than that of Florence is consequently cheaper, and the fact that it is made in the port of shipment gives it special advantages and facilities as regards export. The total value of the industry in a good year amounts to quite 2,000*l*. The galleria of Sigg. R. Bartoli & Co. in this city is also worthy of note for its excellent selection of objects of the Volterra miscellaneous industry.

A great quantity of articles in alabaster is sold at Pisa, and no inconsiderable quantity is worked there. Though Pisa has altogether lost her old favour as a winter residence for strangers, the number of hurried sightseers who stop to see the famous group of the Duomo, the Leaning Tower, the Campo Santo and Baptistery is enormous, and many of them are ready purchasers in the tempting alabaster shops with which the city abounds. Volterra, Florence and even Leghorn furnish Pisa with her stocks, but she also does some of her own work. The value of the worked alabaster—chiefly sculpture—produced in Pisa in one year amounts to about 4,000*l*., while the value of the articles sold there annually must be fully double that amount.

Among the several causes that militate against a greater prosperity in the alabaster trade in general, the most prominent to the impartial observer will seem the unsuitable taste that prevails both in the sculpture of Florence and the miscellaneous worked industry of Volterra. In the former branch, classicism, late and early, Greek, Roman and Canovan runs riot, together with products of an utterly opposite pole, a flashy, vulgar modernity and would-be realism, which gives us roguish dancing girls, coquettish diving girls, faultlessly clad pifferari, impossibly spruce *lazzaroni*, improbably prepossessing *monelli* and a host of other creations, half realistic, half romantic, which however possible in pictorial art cause something like a shudder when contemplated in cold alabaster. The great revival of Christian and Gothic art which has taken place in this century and that now so largely influences the taste of the educated classes of all countries, does not exist for the sculptors of Florence or the workers of Volterra. The churches of Italy teem with the most beautiful objects, but of all the famous pulpits, fonts, statues and images they contain, scarcely an example is to be found in the alabaster galleries, though the pliant graceful material would lend itself admirably to the reproduction of such models. An impression must exist that people would not care for them. How mistaken this impression is a small fact will help to show. At Pisa alabaster models of the celebrated Duomo and Baptistery and Leaning Tower are freely made, and they sell largely. Without question a fresh impetus would be given to the alabaster trade if a fresh current of taste were introduced into the worked industry, and the Italian sculptors and workers need go no further for their new models than to the rich treasures of Italy's churches and palaces.

In the miscellaneous worked industry of Volterra, the prevailing taste is little less deplorable. The elaborate florid design of the vases is such as our grandmothers in the thirties and forties were wont to delight in, but of the severer, simpler taste that now happily finds much favour, Volterra is all unconscious. Another regrettable fact is a certain perversion of taste in the selection of the objects worked up. A picture-frame, for instance, however beautiful the workmanship, becomes an incongruous and uncomfortable object when worked in alabaster. The same may be said of the countless little canons with guns of agata and carriages of alabaster which are made at Volterra. And surely the alabaster representations in unblushingly realistic colours of fruit and flowers and birds are artistically extremely reprehensible and cannot but tend to lower an industry which has a very reasonable claim to be considered one of the fine arts. But the climax of incongruity is, perhaps, reached when we are asked to admire an alabaster model of a modern twin-screw fast cruiser, fully rigged and mounted, and equipped with all the panoply of war.

Still while making these few strictures on the faults in taste which are exhibited, faults which certainly do not arise from any innate bad taste on the part of the workers, but from a belief that they please, it is impossible sufficiently to admire the exquisite skill which is manifested even in the meanest objects. The secret of swift, sure, deft-handedness has, more or less unconsciously, been passed on from father to son, and the workers are justly proud of the venerable antiquity of the art and its mellow traditions. Volterra need fear no rival in her special branch of the industry, for she is secure in customs and traditions that cannot well be copied, and this branch of the art at least would surely perish in any forcible attempt at transplantation.

THE ARCHITECTURAL ASSOCIATION.

A LARGE party of members of the Architectural Association visited last Saturday the Pavilion Theatre, White-chapel, which we fully illustrated in our last issue. Mr. Ernest Rüntz, the architect, under whom the recent remodelling of the theatre has been carried out, met the party and first gave them a short address describing the alterations which he had made in the old theatre and the reasons which had led him to make the various improvements, especially the consideration of the class of patrons of the theatre, which, as Mr. Rüntz well pointed out, is of vital importance in the designing of any theatre. The Pavilion Theatre for comfort, safety and enjoyment now is an excellent model of what a people's theatre should be. White-chapel and the great East End of London is not only the home of poverty, but a vast number of the middle class who make the backbone of the population, and the Pavilion provides for the middle class an entertainment and a place of amusement equal, except only in cost, to any they can get in the West. After listening to the architect's address and inspecting the plans, the members were conducted by Mr. Rüntz, his assistants Mr. Belcher and Mr. Ford, and Mr. Cohen, the manager, over the various parts of the theatre, and as rehearsal and scene-painting were going on, they learnt as much as one afternoon could teach of the making of a theatre. Refreshments provided by the architect were then enjoyed, and the proceedings ended by a vote of thanks to Mr. Rüntz, proposed by Mr. B. F. Fletcher, the hon. sec. of the Association in charge of the visit.



English Archaeological Study in Greece.

SIR,—In the notice of Professor Durm's proposed restoration of the Lion of Chaeroneia in your issue of the 15th, you stigmatise the work done by English students in Greece as merely "a little pottering which may help to entertain a few ladies and officials." It is true that the British School of Archaeology in Athens, with an income from voluntary subscriptions of barely as many hundreds as the French and German Governments spend thousands on their respective institutes there, cannot acquire a first-rate library or undertake feats of archaeological engineering like the excavations of Olympia and Delphi, or maintain a staff of specialist professors such as are attached to the other schools. But it does not need a very minute study of the reports of the Antiquaries, the Hellenic or the Royal Geographical Societies, to show that a sound training is being provided, and solid work is being produced by our own institution; and the names of Messrs. Penrose and Gardner, its past and present directors, and of Messrs. Hogarth, Munro, James, Loring, Bather, Woodhouse, Stuart-Jones, taken at random from the roll of students, are commonly associated by archaeologists with something more than "a little pottering."—I enclose my card, and remain, yours, &c., ONE OF THE POTTERERS.

Oxford: February 19, 1895.

GENERAL.

Mr. Alfred Gilbert, R.A., has been elected a member of the Athenæum Club by the committee, under the authority of the special rule.

Herr Winter, of the Berlin Museum, has discovered that the marble figure described as "A Greek King as Hercules," is a portrait of Mithridates Eupator.

The Council of the Royal Society of Painter-Etchers on Tuesday elected the following Associates of the Society, viz. W. S. Hale, J. C. Murray.

The Aberdeen Harbour Commissioners have resolved to proceed with a scheme of harbour improvements, which is estimated to cost about 46,000*l*.

Miss May Morris will lecture on "Mediaeval Embroidery" in the Applied Art Section at the Society of Arts on Tuesday, the 26th inst.

The Institution of Civil Engineers meet on Tuesday, the 26th inst. Among the papers on the programme is one by Mr. Robert Robertson, on "Electrical Haulage at Earnock Colliery."

Lincoln's Inn Fields, which will be opened as a public recreation ground on Saturday, has cost the County Council altogether 13,000*l*.

Mr. W. B. Richmond, A.R.A., will begin a course of lectures on the "Evolution of Sculpture" to the students of the Royal Academy on Thursday.

The Architect.

THE WEEK.

MR. EWAN CHRISTIAN has departed from us after a life which was almost enviable. He had passed his eightieth year; he had acquired the respect of the numerous architects who met him as the representative of the Ecclesiastical Commissioners. It might be said that the greater part of his life was spent in the exercise of judicial functions, and he fulfilled his duty with a sense of justice which was never surpassed in any of the courts of law. As he once said of himself, "Mine has been a life of independent service, not of exploits. I have undoubtedly done much work, and some, I hope, of a valuable kind to those most interested; but I could not think of comparing myself with the great architects and archæologists of our own and other countries. My highest ambition has been that of doing to the best of my ability the duty from time to time set before me to accomplish, and of maintaining unsullied in every sense the high character of an honourable and independent architect." These manly and yet modest words expressed an ideal of character which nobody could dare to say was not in keeping with Mr. CHRISTIAN's daily life. He held an onerous office, and he never endeavoured to turn its functions into indirect advantage for himself, as has happened in other times and places. Sometimes he found his duties trying, as when novices, immature or unskilful architects, endeavoured to uphold their notions against his experience, but in the end he generally enjoyed the satisfaction of a rational victory. Mr. CHRISTIAN, in fact, made the duties of his office more onerous to himself by the pains he bestowed in trying to raise the character of many of the designs submitted to him, and, if it were not for his endeavours, we are afraid a great many churches would have a more unpleasing appearance. His own work, whatever the style, was always in excellent taste, but he could not escape the fate of all critics in the arts. He became over fastidious, and designed as if his powers were restrained. It was as a judge that his keenness, honesty and skill were most apparent. Mr. CHRISTIAN's report on the designs for the Edinburgh Cathedral is a model of its kind. Every line reveals the knowledge of a master who was competent to recommend alterations in the work of the ablest among his contemporaries, and who was not afraid to express his own preference. Many architects have had reason to be grateful to Mr. CHRISTIAN, and we trust the respect for his memory will be expressed in a permanent form.

By the death of THOMAS EDWARD BRIDGEN Manchester has lost another experienced architect. He was born at Wolverhampton in 1832, and served his articles with GEORGE COTTINGHAM, whose Mediæval proclivities are remembered. Mr. BRIDGEN commenced business in Manchester in 1859, in partnership with Mr. PENNINGTON. One of the earliest important buildings designed by Mr. BRIDGEN, and erected under his supervision, was the Hospital for Sick Children at Pendlebury. This was the first hospital built in this country on the pavilion system, and it has served as a model for many others. On all questions relating to the designing, planning and fitting up of hospitals he was an authority. Although at one time very warmly in favour of the pavilion system in preference to any other, in later years experience led Mr. BRIDGEN to modify his views so far as to consider a corridor hospital under certain conditions but slightly inferior. The remodelling of the sanitary and other portions of the Manchester Royal Infirmary was entrusted to him. The enlargement of Stockport Infirmary, Ancoats Hospital, and other institutions were also carried out under Mr. BRIDGEN's advice. In London his firm has constructed at Winchmore, for the Metropolitan Asylums Board, a hospital comprising accommodation for 850 patients. Amongst other buildings Mr. BRIDGEN designed and erected in the Manchester district were St. Bride's Church, Brooks's Bar; St. Clement's Church, Chorlton-cum-Hardy; the spire of the church of Holy Innocents, Fallowfield; the Inland Revenue offices in Mount Street; a block of offices at the

corner of Albert Square and Cross Street; the Eye Hospital, Oxford Street, besides numerous warehouses and private residences. He designed and erected a block of buildings for the Queen's Building Society in John Dalton Street and Deansgate, Manchester. The designing of this building gave Mr. BRIDGEN great pleasure, as it was surrounded by four streets, and, having somewhat a free hand in thus making a completed block, he produced what is perhaps his happiest work—a specimen of English Tudor suitable to a large town. In 1894 the partnership with Mr. PENNINGTON was dissolved. Mr. BRIDGEN was subsequently engaged up to the time of his death as joint architect, with Mr. CHARLES HEATHCOTE, in the collaboration of designs for the further enlargement of the Manchester Royal Infirmary. Mr. BRIDGEN gained the reputation of a firm friend, a cheery companion and an able architect.

THE London County Council have inflicted more injury on the ratepayers through the medium of their Works Department than is ever likely to be realised. On Tuesday a sort of atonement was offered for past misdeeds by passing a resolution which would be an obstacle to similar extravagance by their successors. It was resolved:—"That the works committee should keep separate accounts in such a manner as to show the cost of each work executed; that the actual cost and final estimate should, as far as practicable, be ascertained and certified within three months after the completion of the work; and also that half-yearly statements should be prepared showing the amount of the original estimate and the amount of the certified actual cost." There is characteristic presumption in this endeavour to compel a new Council to adopt a different sort of book-keeping. If a system of the kind is useful, why was it not employed from the first attempt to meddle with contracting? It is to be hoped the new Council will be able to make use of the methods which are familiar to men of business, and, unless we are mistaken, it will need only a short experience in Spring Gardens before the conclusion is arrived at that the Works Department must be transformed. Although it is in a scandalous condition, we doubt if it is the worst—that is, the most extravagant—of the Council's creations.

THE unsatisfactory arrangements in connection with the Chicago exhibition have caused much loss to exhibitors, which is aggravated by the indifference of the American people to a state of affairs which should be considered as a national disgrace. A case arising out of the exhibition, which came before the Queen's Bench Division in Dublin on Monday, suggests how wide are the effects of American mismanagement. The plaintiffs brought an action to recover a sum of 36*l.* balance of account for freight for the carriage of a number of stone crosses, the property of the defendant, who is the proprietor of the Ardbraccan quarries, and also for taking care of the crosses until the close of the exhibition on October 31, 1893. The defendant counter-claimed against the plaintiffs for negligence on the part of the plaintiffs' representative at Chicago for not properly taking care of his exhibits, with the result that the crosses were taken possession of by the exhibition authorities after the close of the exhibition. The plaintiffs' case was that their duties with reference to the defendant's exhibits ceased at the close of the exhibition in October, and that they were not responsible for anything that had occurred to them after the 31st of that month. At the trial the jury found for the plaintiffs for the full amount of their claim, and on the counter-claim they found for the defendant 15*l.* damages for negligence on the part of the plaintiffs prior to the close of the exhibition, and 150*l.* damages for negligence subsequently. The plaintiffs then moved to set aside the verdict for the defendant for 150*l.*, on the ground that there was no evidence of any contract by which any duty was cast upon them to take care of defendant's exhibits after the close of the exhibition. The Court unanimously set aside the verdict obtained by the defendant on the counter-claim for 150*l.* The result is according to law, but is it not discreditable to find the authorities of the Chicago exhibition seizing on a number of Celtic crosses which a too confident Irishman entrusted to them?

HUBERT ROBERT.*

SO many speculations have been offered about "the harbingers preceding still the Fates and prologue to the omen coming on" of the French Revolution, we have often wondered why the paintings of HUBERT ROBERT were not utilised for that purpose. If Destiny wished to create riddles as forewarnings to the French nobles, what could better serve the purpose than the countless pictures of the ruins of Roman greatness which he painted? France was in a moribund condition in the middle of the eighteenth century; but, as usually happens with such patients, was indifferent about the consequences. The works of HUBERT ROBERT would have served as texts for any philosophers who cared to predict future events. But nobody was disposed towards that sort of exercise, and the painter least of all. Although he might be supposed to have spent his hours of relaxation in reflections among the tombs, there never was a more joyous man. Life had few sorrows for him. When he had fallen on the gloomiest days, and was awaiting for months in the prisons of Ste. Pélagie and St. Lazare to be ordered off to the guillotine, his liveliness could not be overcome. Death seemed to be kindly disposed towards the old *gamin de Paris*. After his liberation he fared better than the majority of artists who had served royalist patrons, and when the inevitable hour at last arrived the artist was in his merriest mood, awaiting his wife in order to accompany her to a dinner-party. As his admirer Mme. LEBRUN, the painter, said, the happiness which accompanied him through life was not absent from his death. If HUBERT ROBERT had been destined to produce symbols of warning, he performed his task without much suffering to himself. DIDEROT, who generally tried to make the best of things, could not understand why HUBERT ROBERT did not introduce melancholy and meditative figures amidst his Classic ruins. If the painter had been more of a philosopher he would probably, by figures and other means, have endeavoured to express the pathos of neglected and debased examples of architecture. ROBERT, however, accepted decay as inevitable, and he was glad that time had graciously permitted fragments to survive which were adapted as subjects for his paintings and drawings. He belonged to an age when artificial ruins were considered to be the fitting accompaniments of gardens and pleasure-grounds.

There never was a painter, and we are not forgetful of CANALETTO and PANINI, who was more reverential towards architecture than HUBERT ROBERT. To display his reverence he jeopardised his life. Born in 1733, he was brought up for the priesthood, but the Latin classics, which had almost become a native language for him, only made him imagine the greatness of Roman buildings. To realise his visions he ignored all the parental plans for his future and ran away from the ecclesiastical college to Rome. His one ambition was to represent Roman architecture. If HUBERT ROBERT had known more of ordinary life he would have tried in Paris to earn a studentship in the French Academy in Rome. But he was only a neophyte who had been brought up secluded from the world, and he imagined it was only necessary to offer himself to art as other candidates presented themselves to the monks and he was sure to be received with welcome. Fate was kinder to him than to the majority of those who seek after greatness along irregular paths. At the time the Marquis de MARIGNY, a brother of the POMPADOUR, was in power. He was destined to be one of the rulers of France, and it was considered requisite as such to make of him an authority on all that relates to taste. He was, therefore, sent off under the tutelage of COCHIN and FRAGONARD, to Italy, in order to inhale, as it were, all the mysteries of æsthetics. Through the influence of the Marquis young ROBERT was allowed to share in the advantages of the education of the Villa Médicis on bearing a part of his expenses. The artist remained eleven years in Italy and during that period there were few of the more noteworthy ancient buildings which he did not represent.

When he returned to Paris he was in difficulties for a time. HUBERT ROBERT'S training was irregular. He

was, to a great extent, self-taught, and at the time that method was not appreciated. In the middle of the eighteenth century monopoly prevailed in art as in other kinds of business. The little that the Académie Royale let pass was seized by the Guild of St. Luke. The only opportunity for exhibiting allowed to artists like HUBERT ROBERT, who did not bear the official stamp, was on an occasion when there was a religious procession. Some of the public places were then hung with tapestry, and for the few hours the drapery remained pictures might be attached to the pieces. Many painters, who afterwards became famous were first made known to connoisseurs in that way, and HUBERT ROBERT was probably compelled to adopt it. But he was not long destined to follow an irregular course. In 1766 he presented himself as a painter of architecture, with examples of his paintings, before the Academy, and without further delays he was admitted. The election was a testimony to his abilities and to the influence of Mme. DE POMPADOUR and her brother. In the next Salon, among the numerous pictures he exhibited was one, *Ruins of a Triumphant Arch and other Monuments*, which was described as being prepared for Bellevue, the château that was erected by Mme. DE POMPADOUR. That entry in the catalogue was enough to make ROBERT'S fortune.

The list of the works he produced until the close of the century is amazing, not only from the number of pictures, but the adherence to one class of subject. In London a painter in oils who produced a representation of a building could not expect to find a purchaser. The reason is that among us architecture is not esteemed by the public. On an average HUBERT ROBERT exhibited a dozen paintings of architectural subjects in every Salon. They were derived from Rome and its neighbourhood, Frascati, Tivoli, Naples, Florence. Occasionally we find a representation of a more distant work, as *Ruins of the Famous Portico of the Temple of Baalbec at Heliopolis*, or *Marius seated amidst the Ruins of Carthage*, or the *Ruins of a Temple Built in Athens*, but they were derived from sketches by some other artist. St. Peter's in Rome was made the subject of several paintings. Architecture was not treated in the eighteenth century with the exactness which photography has made necessary. ROBERT, like PANINI, was regardless of actuality, and brought buildings together in his pictures which were separated, if by doing so he thought he could produce a more effective composition. One of his pictures was *A Greek Temple with the Colonnade of St. Peter's*. Another was *A Ruined Palace, under the Arcade of which is seen the Cupola of St. Peter's*. Besides hybrids of that sort, we find combinations such as *The most Celebrated Antique Monuments of France*. One of the pictures reproduced represents the Porte Saint-Denis, the Fontaine des Innocents, the church of Sainte-Geneviève, the colonnade of the Louvre, and the astrological column of CATHERINE DE MÉDICIS, forming one group. This painting must have been a late work, for in the centre is the Lion of St. Mark, from Venice, which was among the revolutionary spoils. There were occasionally views in Paris. One represented the removal of the centres of the arches of the Pont de Neuilly. As was to be expected, not one of HUBERT ROBERT'S works depicts a Mediæval building, although France possessed an abundance of picturesque examples. His reputation as a man of taste would suffer if he placed Notre-Dame or St. Etienne du Mont on canvas.

The criticism on his works revealed more appreciation of the qualities that were necessary in a painting of a building than would be found in our time. The effects of light and shade on grand masses, the perspective and the detail are noted. "All ROBERT'S pictures," wrote one critic, "are imposing; by the magnificence of the edifices he has selected for subjects he seems to surpass his models and to be more *recherché*, more finished, more French." His *Grande Galerie* was admired for "the immense depth that is rendered with a light touch, the play of light on numerous objects, and the seductive harmony of tones." DIDEROT'S notices are especially interesting. About one, where the arrangement of the picture was symmetrical, he said:—"There is probably more poetry, more of the accidental in a cabin, but certainly in a tree that has endured years and seasons, than in the whole of the façade of a palace. We must ruin a palace in order to make it an object of interest.

* *Les Artistes Célèbres; Hubert Robert et son Temps.* Par C. Gabillot. (Paris; Librairie de l'Art.)

In fact, there can be no true beauty without the ideal. The beauty of the ideal strikes all men; the connoisseurs alone are arrested by execution." At another time we find DIDEROT objecting to the appearance of ROBERT's sketches in the Salon:—"If this artist will take to sketching he will lose the habit of finishing; head and hands will become libertines. If he sketches now when he is young, what is he to do when he grows old? He wishes to gain ten louis in a morning, because as he is extravagant and his wife elegant money goes quickly. But talent also goes, and an artist who was born for greatness becomes mediocre. Acquire the habit of finishing, M. ROBERT, and in time you will find it will be as easy to produce a picture as a sketch."

HUBERT ROBERT's works were able to sustain criticism. Examples were considered necessary for every gallery which aimed at perfection. His rivals in the same line were beaten out of the field by his vigour. ROBERT attained official rank, and he gained a tenement in the Louvre. It suggests the inevitable connection which was supposed to exist between ruins and gardening when we find him in request as a designer of picturesque grounds. The grand style of LE NÔTRE had fallen out of fashion. It is not improbable that HUBERT ROBERT, while living in Italy, had seen examples of the gardens which were laid out by the Scottish gardener, JACOB MOOR, who died in Rome in 1793. Under his direction the gardens of the Villa Borghese on the Pincian Hill were laid out, and he was the first to delight the Roman artists with an English garden. MOOR introduced sculpture and architecture as features, and his ideas and ROBERT's corresponded. One memorable work entrusted to the latter was the rearrangement of the rockwork and sculpture at Versailles, known as the Bains d'Apollon.

The prospects of HUBERT ROBERT at the beginning of the reign of LOUIS XVI. were hopeful. He was not only designer of the royal gardens and peintre du Roi, but in 1789 he was appointed as one of the two custodians of the king's pictures at the Louvre. In a little time there was a change. The Bastille fell "like the city of Jericho by sound" in July 1789, and immediately ROBERT produced for the Salon a painting of it during the first days of its demolition. He was also suspected of having made over some of the royal pictures to the district of St. Germain-l'Auxerrois adjoining the Louvre. The Salon exhibitions were held in 1791 and 1793 as if France was not in the throes of revolution. HUBERT ROBERT, as usual, exhibited pictures of ruins, tombs, and fragments of antiquity. The party known as the Mountain gained the upper hand in August 1793, and the Reign of Terror began. A few days after the execution of MARIE ANTOINETTE, HUBERT ROBERT was arrested as a suspect and lodged in Ste. Pélagie. It is generally understood that his denunciation was the act of DAVID, the painter. Both were admirers of ancient Rome, but there was no clashing between their works. One painted architecture, the other long-legged, excitable figures. ROBERT saw Roman buildings, but DAVID drew from imagination. If DAVID did not send ROBERT to prison, he made no effort to free him, and for a time his power was not limited. HUBERT ROBERT accepted his lot in a very quiet and manly way. He did not pose as a hero, like so many of the revolutionists. Among his companions in prison were AUDRAN, of the Gobelins, ROUCHER, the poet, MILLON, the archæologist, and RESTOUT, the painter. ROBERT was able to read and to paint. He sometimes utilised the plates on which his food was brought in instead of panels, and his sketches on them found purchasers, especially among English amateurs. Some of his companions were summoned before the Convention and duly passed under the hands of M. SAMSON and his assistants. For nearly a year ROBERT remained in prison, daily expecting sentence. The fall of ROBESPIERRE brought the Reign of Terror to an end, and on the 17th Thermidor of the year II an order was given to ROBERT's wife for his release.

He was hardly free when he was appointed by the Convention one of the five citizens who were placed in charge of the National Museum of Arts, which was afterwards known as the Musée Central des Arts. ROBERT and his associates had care of the works of art belonging to

the nation. In the course of a few years the collections were increased by the most valuable works in Europe. The Musée Central became the Musée Napoléon. A new organisation was created, and ROBERT and his associates retired on pensions. All parts of the Louvre were required for the new treasures. Accordingly, ROBERT and the artists who were privileged to have *appartements* were evicted. Fortunately, he possessed a house at Auteuil, and there he resided in comfortable circumstances until his death on April 15, 1808.

Architectural subjects have long ceased to attract, and in consequence the painters who gained a temporary reputation by them have been overcome by oblivion. Until M. GABILLOT undertook the duty, there was no biography of HUBERT ROBERT that possessed the least value. As substitutes were articles in encyclopædias, in which a few stereotyped statements were repeated without examination, M. GABILLOT has spared no exertion to discover the truth, and the literature of art is at last enriched with a biography of HUBERT ROBERT that is worthy of the subject. It contains also much information about the artist's contemporaries, and the volume is one of the most delightful of all those which relate to that fascinating but until lately most neglected epoch, the eighteenth century.

BIRMINGHAM SCHOOL OF ART.

THE annual distribution of prizes to the students of the Birmingham Municipal School of Art took place on Friday in the large theatre of the Birmingham and Midland Institute, by Mr. W. J. Wainwright, A.R.W.S.

Mr. Wainwright, according to the *Birmingham Post*, in his address to the students said the present distribution differed from those in preceding years inasmuch as the committee had invited for the first time an old student of the school to undertake the honour and responsibility of performing that ceremony. That was an act of recognition from the committee to the old students, and they saw in it an indication that they had given to the committee some cause for satisfaction, and that they had used not unfaithfully the advantages which the committee were able to give them in days gone by. He asked his old fellow-students and colleagues to call his voice their own, and said they would raise it first in affectionate tribute to those city fathers to whose unwearied zeal in the cause of art the community owed so much—to Alderman Kenrick, to Mr. Bunce, and their colleagues past and present. Those names which his audience had received so heartily would be held in honour so long as art should be esteemed and unselfish devotion to public duty accounted a virtue in their midst. To them the students owed the advantage of having had the early guidance of their revered master, Mr. Taylor. He had been to them a good master, for by example and precept had he shown them what it was to be an artist; and wherever their subsequent steps might have taken them, his early influence had not been effaced and could never be forgotten. Far back in the middle of the century a movement was set on foot to secure for the industrial arts of Birmingham the artistic training and education essential to their prosperity, and the School of Art was established and carried on its early work for years in comparative obscurity through the dark days of departmental experiments—for art demanded of her votaries, both Government departments and individuals, a long apprenticeship. Faithfully the Birmingham school had served her apprenticeship, and to-day they beheld her a municipal institution, a peerless school of art and an administrative achievement worthy of the best traditions of the city. The first students laboured in the dawning light, the present students stood in the noonday, and it was to impress upon the latter to value at their true worth the priceless advantages they enjoyed that he was there that evening. In athletics any appreciable lapse in his progressive training entailed the physical impossibility of the athlete reaching the highest excellence. So it was in art-training. There was a consistent change going on in the students themselves, not only physically with regard to hand and eye, but in the mental vision also. For instance, in many points of painting and criticism young painters were not always in sympathy with mature work, nor did the particularisation of young painters satisfy entirely those who had attained to broader visions. It followed that the mature work was satisfactory or the reverse, so far as finished artistic expression was concerned, exactly in the measure in which the artist had profited by the succeeding changes of his condition to acquire in those periods all the power of expression that it was possible for him to acquire. Experience had determined in art training the exercises most conducive to the gradual acquisition of that power of expression, and he wished to advise them, and especially the younger students, never to lose sight of this

condition, upon which their ultimate success was dependent, but to pursue their progressive studies with conscientious completeness, doggedly if the studies should be irksome, ever bearing in mind that neglect in this respect would most likely entail some regrettable deficiency later on. The mind of the designer must not only be exercised and trained, it must be nourished and supported. This food for the mind might be obtained from countless sources. One of the characteristics of a fertile mind was its capacity to draw sustenance from any and every source capable of yielding it, but the acknowledged and necessary sources were found in nature and the best examples of decorative and ornamental art. From the alembic of the mind this mental food came forth again in new proportions and character, and this coming forth was ordered by principles which were the foundation of style. Without style there was no ornamental art worthy of the name—it was an incoherent babble, out of joint and worthless. They saw that three principal factors went to the education of a designer; he must first acquire by training power to express ideas; he must then sustain those ideas by improving his mind; and, lastly, he must be taught style with which to order the expression of his ideas. All these three factors were independent, and should as far as possible be equally cultivated. It must be the artist's endeavour to echo the harmony of nature in every part of his work. He must not be satisfied to have beautiful ideas, he must not rest content in presenting those ideas conformably to the ordering of style, but must in every touch by which he gave expression to them preserve the utmost consistency and harmony. In many works dealing with the principles of art unfortunate allusion was made to the freedom from rules, principles and other constraints which genius was said to enjoy, and consequently the young student often committed the pardonable error of wondering if he was a genius, and, ending by giving himself the benefit of the doubt, failed to obtain useful knowledge and guidance. It was much better to assume that there was no such thing as genius in the art of design, and the artists whom he had known to possess most claim to the title had been precisely those who had most respect for principles and rules, and who, knowing most about them, were ever studying and drawing inspiration from the best examples of art. The student who, under the impression that he had originality, pursued a different course, would assuredly labour only to find out his inability to do anything of lasting value. Art, to truthfully reflect nature's harmony, must be continuous, and art could not be continuous unless she ever rested on and proceeded from what had gone before. Practice, no less than theory, insisted that all art development must have its roots in the past, and the stronger and deeper those roots were the nobler and stronger would be that development. The knowledge of historic art must not be limited to text-books, but must be obtained at first hand under proper direction, and the supply must be continuous. French artists, whether painters, designers or craftsmen, continued their academic studies long after they had achieved a reputation, and that, no doubt, was a principal reason why they were able to maintain their reputation. Cessation of study at any period of an artist's career was the herald of decay. To the industrial artist there was another powerful and ever-present reason for keeping himself within the influence of past ideals, and that was the inevitable and lowering effect of commerce upon art. It must not be thought that the association of commerce with art was a calamity, for, as they knew from history, commerce had over and over again protected and fostered art. When commerce from protecting art came to degrade it, they should first inquire whether artists had been true to themselves or their profession. It was necessary to remember that art and commerce were distinct in their nature, and although often in alliance could never be united. To make this clearer he would instance one engaged in the production of articles of commerce, and which at the same time professed to be objects of industrial art. Here, apparently, art and commerce were united, but they could only be united in a sense if the articles made were made in a commercial spirit; but that meant ruin to their art quality. Whilst the craftsman was at his work he must be an artist and not a commercial man, but in planning his ware to suit requirements in the disposal of it, and in all else than the art part of it, the commercial spirit might be exercised with advantage, but art must be kept intact. The commercial man was not to be held answerable for art, and when he passed the line of sound honest commercial principle and followed a policy which right-mindedness could not approve, he was then working direct or indirect injury to all worthy interests, commercial and artistic alike. When that line had not been passed art had benefited by contact with commerce. It was well, then, that artists and art craftsmen should approach the matter frankly and see how far they themselves had to answer charges of tradiness and bad taste. Let each examine for himself how far in his professional career he had made an effort to keep up and improve the tone of his work by continued study, and in how much he had allowed surmountable difficulties to obscure the bright aspirations of youth. When they looked round and noted the reverent care

with which the relics of the past were treasured, whether they were valuable or not, provided that they conveyed some message from the past, and the widespread disposition of the people to grace their daily life by beautifying their surroundings, they recognised that they lived in an appreciative age, and he would remind them that great opportunities which others had sighed for in long disappointment and neglect lay before them. They would encounter difficulties, and failure would often attend their best efforts, but they must bear it in strong patience, for success was reached through failure. Exacting or unsympathetic conditions of employment might tempt them to do less well than circumstances would admit of, but he advised them to meet that temptation with the knowledge that to yield to it was to risk loss of artistic character. That might sound to them like a counsel of perfection, but it was a condition of success. The cynicism with which ardent enthusiasm of beginners was so often chilled by those who had had experiences proceeded too frequently from the hopelessness resultant upon the conscious loss of tone confirmed by the gradually acquired habit of doing work, not as well as it could be done, but only sufficiently well to pass muster. He had said that commerce could not be saddled with the censorship of art, but commerce was constrained to accept what art offered, and if art was truly exercised, even at cutting prices, the public who again were dependent upon artists for their art would in the end learn to prefer good from bad art, and commerce even of a bad type would acquiesce. In a word, it was possible, if artists were true to themselves and their profession, to cause bad art to be unmarketable, and when that point was reached another golden age of art would begin. They were entering on their profession, and in process of time would represent the industrial art of the city, which would be what they made it. He hoped that their enlarged opportunities would enable them to make the art of their city better than they found it, that they would emulate the past glories of industrial art and seek to excel them, nor forget the spirit which animated the artists and craftsmen of old. Right in mind and strong of heart, their predecessors had shown that that pure exalted ideal in industrial art was no delusive mirage, that commerce was no canker. They had left us the secret of amassing wealth whilst elevating art, and though their wealth had perished, their art remained to show the high ordering of their daily life and thought. Humble in worship, proud in patriotism and thorough in everything, they had left us an example of what the artist citizen should be. It was for the students of Birmingham to study, treasure and follow that example in the interests of the art to which they were devoted and the city whose reputation it was their proud duty to uphold.

YORK ARCHITECTURAL SOCIETY.

At the ordinary meeting of the above Society, held at the Church Institute, Mr. A. Pollard, past president, in the chair, Mr. J. W. Longfield, of the Art Metal Works, Otley, read a paper on "Wrought-iron Work." The lecturer dealt very exhaustively with his subject, and in the course of his remarks said that no material was more worthy of study than wrought-iron, for no substance on earth had more profoundly influenced the destinies of the human race. Though it was the cheapest of metals, and lacked many of the intrinsic qualities of the precious metals, it immeasurably surpassed the whole of them together in interest and in its value and utility to us. As regards its principal attributes, it stood among the metals as the working masses stood in a civilised community, and had ever proved a most mighty instrument for good or ill. The discovery of immensely rich ores of iron in almost every part of the world, and of fuel fit to reduce them, had already inaugurated a period of decline in the production of iron ore in this country, and should lead us to prepare for the inevitable change from the raw produce mart to the art-produce mart of the world, which must ensue if we were to maintain our trading supremacy in the future. The recent movement in favour of the adoption of wrought-iron work for architectural and domestic purposes in preference to the hard geometric productions of the foundry had caused one to wonder why this beautiful art had become superseded by cast-iron. He was afraid that cheapness, as in a great many other things, was responsible for it. A peep inside our old cathedrals, such as York Minster, amply demonstrated the love of our forefathers for the beautiful examples of the smith's art which were now coming to the front again. If forges superintended by experienced smiths could be erected in our technical schools, he was sure that many young men would learn the craft, and not only improve their means, but produce a supply of mechanics which was really becoming needed. In accuracy and finish the English workman was all that could be desired, but when they looked for taste, idea or originality, he was most disappointing. Furthermore, it was often next to an impossibility for a smith

to execute the designs of many architects except at a great cost, whereas a similar effect might easily be obtained if the architect had a slight knowledge of the material in which the design had to be made. In conclusion, Mr. Longfield urged that if architects and those engaged in the building trades were to apply themselves more fully to the study of the craft, wrought-iron work as an art would make greater strides in the future than it had ever done in the past.

IDEALS OF PAINTING.

A LECTURE on the above subject was lately given by Professor Baldwin Brown in the Art Gallery, Glasgow. The branch of art to which he principally limited his remarks was decorative mural painting, a branch he chose because it had already been little treated of here and was a subject of great importance to an urban community. He pointed out that little had been done by painters of this country in the way of mural decoration, and consequently its methods were imperfectly known in Great Britain, but it was a department which ought to be encouraged in Glasgow, whose school had the good fortune to possess artists fitted to shine in that department. After indicating how the ideals of painting and the standard of excellence among early Italian artists differed from those of later painters of Spain, Flanders and Holland, and specially how vastly Rembrandt had widened the field of art, Professor Brown proceeded to dwell particularly on fresco work. He chose as his principal example the great decorative paintings of the roof and east wall of the Sistine Chapel, by Michel Angelo. After illustrating the manner in which that Titanic artist bent the architecture to his own purposes, Professor Brown showed in detail the various decorative subjects with which he filled the space at his disposal. The lecture was illustrated with a full series of lantern slides of the Sistine Chapel compositions, and in addition to these a number of the most famous pictures and of the fresco decorations of other public buildings were shown and commented on in a most graphic manner.

DECORATIVE DESIGN.

ON Friday Mr. Charles F. A. Voysey, architect, delivered a lecture in the Manchester City Art Gallery on the subject of decorative design. The meeting was arranged by the Manchester and Salford Association of Master Plasterers and Painters.

Mr. Voysey, in the course of his address, said once remove the strait-jacket of convention in decorative design, and place beauty of thought and feeling above beauty of expression, and the hands of men would soon find their cunning, and art would again be a living power among us. Perhaps when the public had given up telegraphing the rise and fall of railway shares there would be left a little more sympathy for the poetic and imaginative senses, and our playful delight in bird life and strong joyful colour would not meet with so much indifference and disdain. At present it was idle to look among the many for the appreciation of pleasures enjoyed only by the few. Too often the decorator became a sort of head foreman whose opinion was not always asked, and indeed was often scornfully rejected. He was expected to carry out the ideas of others, although he had probably spent his life in the study and practice of his craft. His client, often the lady of the house, did not consider this, but would rather turn, fresh from the mysteries of millinery and with a head full of notions begotten of Parisian fashion books, to her daughters for counsel and suggestion. The decorator, with his years of experience, had to stand patiently by and listen to verbose feminine dogmatism upon a matter to which in many cases his client brought neither knowledge nor aptitude. Think of the hardships the decorator had to endure who was at the mercy of the present generation of upholsterers and furniture makers. Did not the presence in nine thousand out of every ten thousand houses of bastard French, German, Italian and English furniture of the Renaissance persuasion foredoom the decorator's labours? Could it be possible to produce grace, dignity, repose or cheerfulness in the presence of such vulgar, ostentatious lumber? Truly, under modern conditions the decorator's life was a very hard one. It was partly brought on by himself, by his immoral readiness to supply anything, and in fact be pulled by the nose by the public for the sake of the pounds, shillings and pence got out of them. Events in history, political, religious and social bias all affected our taste to an extraordinary degree, but were in fact a most unsound foundation for it. If the painter needed freedom to express the best in him, why not the decorator? If the craft of the decorator was raised from the position of a commercial enterprise to that of an art, it would cease to be necessary for men to strain every nerve and fibre to advertise themselves. Sculptors, painters, decorators, designers and architects must join hands one with the other

over a common object, not to make money out of each other, but to further artistic knowledge and feeling. The lecturer gave some practical hints in illustration of his subject, and urged in conclusion that as a matter of education they ought constantly to strive for simplicity in all they did, and encourage it among their clients, and he was sure that if that was done there would grow up an appreciation of quality rather than quantity.

TESSERÆ.

Concrete Construction.

S MEATON having observed a portion of the outer wall of Corfe Castle in a remarkably leaning position, like the tower of Pisa, was induced to examine it, and found the interior filling of the walls to be of rough rubble and fragments from the quarries cemented with a mortar composed of lime, "doubtless originally of good quality," and a considerable admixture of sharp sand and pebbles, which had evidently been poured in in a fluid state. From what he saw here he adopted a similar method of building the rubble backing of the first lock on the river Calder. Rondelet states that the columns of the choir of the church of Vézelay, in Bourgogne, were ascertained to be of artificial stone by Marshal Vauban, and that the pillars of the church of St. Amand, in Flanders, were made in the same manner. He tells us also that at Lyons concrete is used for wharf walls and the piers of bridges, and that with the Metz lime concrete arches may be constructed without bricks or stones, and these arches will form a single piece as hard as stone. Bélidor states, indeed, that in Metz most of the cellars are so constructed; the gravel used is from the river; and he says that when set the concrete will resist steel-pointed tools. According to Sir William Reid, the walls of the fortress of Ciudad Rodrigo, in Spain, are of concrete, the marks of the boards, which retained the semi-fluid matter in their construction, being everywhere perfectly visible. Besides sand and gravel round boulder stones were employed. These were from 4 to 6 inches in diameter, procured from the ground around the city, which is everywhere covered with them. The Bridge of Lladonet, six leagues from Barcelona, consisting of two rows of arcades placed the one on the other, was entirely constructed of concrete. One of the lower arches gave way from the work being carried up too hastily, and the work was abandoned, but M. de Betancourt resumed it, and raised the bridge to a height of 150 feet, on a length of upwards of 700 feet, with perfect success. Treussart relates that the Italians at Alexandria make very good concrete blocks with the Casal lime, and employ them in angles. They are 4 feet 8 inches long, 2 feet 8 inches wide and 2 feet 8 inches high. They are buried underground for two or three years, and there attain great hardness. He says that Colonel Finot constructed at Strasburg an arch of concrete of 13 feet 4 inches span, which succeeded very well, and that a similar arch was constructed at Schelestadt.

Teutonic Yotens in England.

When our forefathers came into this island they found it covered with Roman towns and buildings, as well as with monuments of an earlier population, in the shape of cromlechs, vast entrenchments and other similar works. With the character and uses of the Roman buildings they were perfectly well acquainted, but they looked with greater reverence on cromlechs and barrows, and indeed on all earthworks of which the origin was not very apparent, because their own superstitions had taught them to attribute such structures to the primæval giants of their mythology, who were objects of dread even to the gods themselves. They believed that the spots on which they stood were under the immediate protection of beings of a higher order than humanity, who frequented them at the silent hour of night, and whose anger it was perilous to provoke. The Saxons brought with them a multitude of mythic traditions and stories relating to their gods and heroes, which they had preserved through ages of which we have no historical account, and the scene of which had been successively placed in every country where they had made a settlement. Many of their stories had thus become located in England when the introduction of Christianity worked a sudden change in people's belief, and what were merely mythic personages were looked upon either as the real heroes of former days or as so many devils and evil spirits. The mythic legends were still current as romances, and continued to exist under altered forms as romances of chivalry, and under various subsequent degradations, until they were at last hawked about the streets in the still humbler form of penny chap-books and nursery tales. It was in this manner and by such gradations that the mighty deeds of the god Thor against the giants of Jotenheim became transformed into the exploits of Jack the Giant-killer. But the peasantry were unacquainted with all these literary vicissitudes. With them the earlier legends were intimately connected with localities, and the names of Woden, and Thor, and Weland

and the rest were often preserved when they had been long forgotten in more cultivated society, and their stories were as often handed down traditionally with very little transformation. When John Leland made his antiquarian tours in the reign of Henry VIII., these local legends appear to have been extremely numerous, and he has alluded to several of a very interesting description. The topographical antiquaries of the seventeenth and eighteenth centuries also make frequent allusions to them, but unfortunately they looked upon them with contempt, and seldom condescend to do more than barely mention them. We may cite one example from the "Itinerary" of Leland, who (vol. v. p. 101), speaking of Corbridge in Northumberland, says, "By this broke, as among the ruines of the olde town, is a place caullid Colecester, wher hath beene a forteres or castelle. The peple there say that ther dwellid yn it one Yoton, whom they fable to have beene a gygant." The giant race of the Northern and Teutonic mythology were termed "Jotens" or "Yotens," in Anglo-Saxon "Eótenas." To them the early Anglo-Saxon poetry attributes works of immense power or antiquity—the mounds and earthworks of ancient days, as well as the weapons and other articles found within them. The wonderful sword which Beowulf found in the den of the Grendel's mother was thus a weapon of Eotonish make. In the same manner the antique vessels of gold found by Wiglaf in the cave in the mound of the dragon slain by Beowulf are described as "ancient work of the giants." At a later period Layamon, who breathes a pure Saxon spirit, describes the giants who (according to the fable) first inhabited Albion as being Eotens.

Latin Mosaics.

A variety of pictorial mosaic may be designated as Latin, since it long retained the marked peculiarities of style which distinguish Latin from Byzantine art. Thus, not in the choice of subjects only, but in the retention of the ruddy flesh-tints, the deep brown shadows and the stumpy figures and simple costumes of the decline of Roman painting do such mosaics as those of the fifth century at Santa Sabina, Santa Maria Maggiore and San Paolo Fuori delle Mura at Rome differ from later specimens executed in the same city, if not by Greeks alone, at least by a preponderance of Greeks over the direct descendants of the original classical mosaicists. Barbet de Jouy remarks that "the mosaics executed from the time of Constantine to the pontificate of Nicholas I. (A.D. 858) do not possess the Byzantine character." This, though partially correct, is far too sweeping an assertion; it suffices, however, to show that the separation in classification of Latin from Byzantine style in mosaics is essential to preserve a correct idea of real, not fanciful, distinctions. The earliest Christian Latin mosaic known is that which lines the vaulting of the little baptistery of Santa Costanza adjoining the basilica of St. Agnese, and dates from the age of Constantine. It would be extremely difficult to say which was the latest. The more closely the matter is studied the more evident it becomes that a distinct Latin influence in the history of art is to be traced running beside, mingling with, but never altogether losing its identity in the great tide of progress which swept from a thousand springs and sources over the whole continent of Mediæval Europe. Thus amongst existing remains of the Middle Ages we may point to three in particular in which many of the Latin peculiarities of mosaic working have been faithfully preserved to a comparatively late date, one in the North of Italy and the other two in that district over which we may frequently recognise traces of the influence exercised by the long-flourishing Latin schools of Aix-la-Chapelle and Cologne. In the pavement of the cathedral at Novara, a work executed at intervals probably between the beginning of the twelfth and the middle of the thirteenth centuries, we meet with a very fair reproduction of a black and white classical pavement. In various medallions are birds and allegorical figures. From this may be readily observed the coincidence which occurs between the tessellation of the Novara pavement and that of the ancient pavements of Pompeii. It is probable that a somewhat similar mosaic pavement, with figures representing Rhetoric, Logic, Prudence, &c., and a zodiac, was formerly in the church of St. Irene at Lyons, a city in the neighbourhood of which many fine classical mosaics existed which might have well served as models.

Restoration of Buildings.

In the hands of an experienced and painstaking restorer it often happens that a design which had been almost utterly lost is in a very great measure recovered, but this can only be done by long and patient study of the fragments discovered; and the work should be indefinitely postponed until these can be thoroughly explored and thoroughly studied. Too much stress cannot possibly be laid upon this. It is the very pith and marrow of restoration. If neglected it is destructive to the work, though if carried out fully it is the great redeeming fact which compensates for many of the annoyances which restoration involves. In such cases all the fragments which can be

by any means grafted into the restored work should be brought in at whatever cost. In difficult cases let the architect stick to it hard and fast until his difficulty is solved, and let him set by as lightly as possible the conjectural theories which, one by one, occur to him, for he may almost depend upon it that they are wrong. Professor Willis might be considered as the only man who could make guesses on which a moment's reliance could be placed. He did so simply because he had a wonderful intuitive power of putting together evidence in his mind which few possessed, and still more because he never made a guess until he had collected and thoroughly weighed his evidence. He had swarms of imitators whose practice was the very reverse. To begin with they only half understood their subject, and they built upon this defective foundation a superstructure of guesses running ahead of the evidence, and adhered to religiously after proof had been found of their fallacy. To those who have not such intuitive perceptions, the only course is not to guess at all, or to set so loosely by theories that they may, one by one, go to the winds without a moment's regret as fast as adverse evidence presents itself.

Raphael's Variety.

There is not a single emotion of the mind, not a single character of passion known to the moral philosopher which he has not caught, portrayed and varied in a hundred different manners, and yet always within the bounds of propriety. We do not find it recorded of him as we do of Da Vinci, that he constantly frequented public places for the purpose of catching these various expressions. The multiplicity of his pictures, too, proves that he could not have had time for such continued observation, while his designs plainly show that he did not equally stand in need of it. Nature had endowed him with a liveliness of imagination which, transporting him in idea to the scene he was about to represent, however fictitious or remote, and thus making it in some sort real and present, rendered him capable of conceiving and of entering fully into those very emotions which the personages of the story must themselves have felt; nor did this vivid conception of his subject ever desert him till he had portrayed the emotions in question with that air of reality which he had either observed them assume in the countenances of others, or with which he had invested them in his own mind. This rare faculty, so seldom met with even among poets, and so much more seldom among painters, no one ever possessed in a more eminent degree than Raphael. His figures seem to be actually inspired with the different passions of love, desire, fear, hope and joy—seem actually under the influence of anger, or else possessed with a spirit of placability, lowliness or pride, just as best accords with the subject in hand: insomuch that the spectator on regarding the countenances, the expressive looks and gestures of his figures, oftentimes forgets that they are but the work of art; he finds his own feelings excited, chooses his side and fancies himself an actor in the scene before him. There is yet another delicacy of expression to be found in his works, and that is the felicity with which he depicts the various gradations of passion, whereby a man may perceive at once whether they are only just commencing their career, whether they are on the increase or whether they are already on the wane. He had in his intercourse with the world observed these varied shades of passion, and on all occasions he knew how to transfer to the canvas the observations that occurred to him. His very silence is eloquent, "Il cor negli occhi." The slighter movements of the eyes, the nostrils, the lips, or the fingers, serve to indicate the first emotions of passion; the more animated and violent gestures express its intensity, and what is more, these gestures assume a hundred different shapes without ever offending against the laws of nature, and conform themselves to a hundred different characters without ever transgressing the bounds of decorum. His heroes look and act like heroes; his ordinary men, like beings of a lower sphere, and what neither tongue nor pen could ever hope to describe that Raphael contrives to express by a few strokes of the pencil. In vain have numbers endeavoured to imitate him; his figures appear as if under the real impulse of mental feeling, while those of others, with the exception of Poussin and some few more, look as if conscious of acting a part like players upon a stage. In fact, in this exquisite delineation of the various passions of the mind consists the grand merit of Raphael. And if it be acknowledged that this quality called expression constitutes the most difficult, the most philosophical and the most sublime walk of art, who then shall dispute the palm with him?

Early Stained-Glass.

Stained-glass was not only necessary on account of its religious or mystical influence, but to temper the rays of the sun in buildings so full of windows as the Gothic churches, and it improved the architectural effect. Of the specimens the smaller are the more ancient. As the art advanced, portraits and groups of the size of nature were attempted. St. Jerome, who lived toward the end of the fourth century, is the earliest author who speaks of glass in windows. Gregory of Tours, in

the sixth, mentions likewise a glazed window of a church which was broken by soldiers. The poet Fortunatus, who lived at the close of the sixth century, in an account of the church of Paris, now Notre-Dame, gives a pompous description of the stained windows. St. Bennet, abbot of Wiremouth in Scotland, who died in 690, is stated in his life to have gone into France to procure artists to build his church and to ornament the windows with painted-glass. According to Warton, "The first notice of painted windows in a church occurs in a chronicle quoted by Muratori. In the year 802 Pope Leo built a church at Rome, 'et fenestris ex vitro diversis coloribus conclusit atque decoravit;' and in 856 he produces 'fenestras vero vitreis coloribus.' This was, however, a sort of mosaic in glass. To express figures, or what we now call 'painting in glass,' was a very different work, and probably it was brought from Constantinople to Rome in the tenth century with other ornamental arts. Guicciardini, who wrote about the year 1560, in his 'Descrizione de' tutti Paesi bassi,' ascribes the invention of baking colours in glass for church windows to the Netherlanders, but he does not mention the period. It is certain that this art owed much to the laborious and mechanical genius of the Germans, and in particular their deep researches and experiments in chemistry, which they cultivated in the dark ages with the most indefatigable assiduity, must have greatly assisted its operations."

The Kajar Palace of the Persian Kings.

The world-adorning taste of the king caused him to direct that a spot of ground, replete with attractions, and situated about half a league from Teheran, should be laid out in a garden like the celestial Paradise, filled with all sorts of trees and odoriferous plants; and that on the summit of a hill, resembling a mound of pure amber, which commanded that garden, there should be constructed a heart-attracting residence. A decree, therefore, resistless as destiny, went forth that the architects and gardeners should combine to display all their talents on this favoured spot. At that hour, which sometimes happens to fortune's favourites, there was formed a garden of such beauty that the splendour of its roses excited envy in the bosom of the roses of Paradise, and the meandering of its limpid waters outshone those of the fountain of life. Some parts of its surface being unequal the hollows were filled up with sifted earth; and in others the hillocks removed, so as to form a continued and perfect level. Fruit-producing trees of every sort and country, odoriferous shrubs, vernal and autumnal flowers were planted in every part of it. It was crowned by a delightful structure and a Paradise-like abode, ornamented with firm bastions, strong curtains and parapets. In front stood a lake, in the midst of which boiled up a fountain like the Fountain of the Sun, spouting forth waters more lucid than the celestial mirror. At this auspicious moment a firman was also issued to repair and gild the pure dome of the King of Martyrs, the explanation of which is as follows. Through ignorance and the hurry of those who were charged by the late monarch to embellish the celestial dome covering the remains of the Lord of Martyrs at Kerbela, and from their not having accurately calculated the strength of the foundation, the dome gave way, rent asunder, and its gold-coloured bricks began to assume a lunar appearance; but in this same year a faithful superintendent was appointed to remove the heaven-resembling dome, and to build another of such solidity that it should receive no injury in the revolutions of months and years; and that gold of so perfect standard should be used as to remain untarnished in the vicissitudes of days and nights. Praise be to the Almighty that, through the architectural wisdom of the orthodox sovereign, this pure vault became more solid than the empyreal vaults of the sky, and was covered with golden bricks more resplendent than the glorious sun. Thus the inhabitants of the whole earth are continually employed in uttering, with responsive Amens, the just praises of the incomparable sovereign.

Ancient Southwark.

The numerous Roman antiquities found in various parts of Southwark abundantly prove the occupation of the place by that people, but it is most probable that the Roman settlement on the Surrey side of the river was confined within the limits of the guildable manor in Southwark, which extended from St. Mary Overies Dock on the west to Hay's Wharf on the east, and included the north side of St. Olave's (commonly called Tooley Street) from Hay's Lane westward to the bridge, the south side of St. Olave's Street westward from Glean Alley, the site of the Hostelry of the Prior of Lewes, both sides of High Street (formerly called Long Southwark) as far as where St. Thomas's Hospital stood, the west side of High Street nearly to the Town Hall, part of the Borough Market, the site of the church of St. Saviour and Montagu Close, being bounded on the west by the Clink Liberty (anciently the Bishop of Winchester's palace and park), and on the east and south by another of the three City manors in Southwark called the Great Liberty Manor. The guildable

manor had probably been part of the possessions of Earl Godwin, who had a house in Southwark. It is stated in Domesday Book, "De exitu aquæ ubi naves applicabant Rex habuit II^{as} parties, Godwinus Comes tertiam." After the Conquest the guildable manor became the property of the Earls of Warren and Surrey, as appears by the deed dated in 1281, mentioned by Stowe (vol. ii. p. 23), whereby John, the seventh Earl, remitted to Nicholas, abbat of St. Augustine's at Canterbury, and the convent of the same, and their successors, suit to his court of Southwark, which they owed to him for all that messuage and houses builded thereon, which they had of his fee in Southwark, situate upon the Thames between the Bridge House and the church of St. Olave. This manor, afterwards falling into the hands of the Crown, was granted by King Edward III. to the citizens of London by a charter dated March 6, in the first year of his reign. It is there called the "vill" of Southwark. This was the commencement of the authority of the City of London in Southwark. The King's manor was then the property of the Archbishop of Canterbury, and the Great Liberty Manor belonged to the monastery of Bermondsey. The City of London did not acquire these two manors, nor had they any jurisdiction in them, until the reign of Edward VI. The distinction between the three manors in Southwark has not been pointed out by any of the local historians, most of whom have supposed that the City of London had jurisdiction over the whole of the present borough of Southwark from the time of Edward III. Mr. Corner conjectures that the guildable manor was the ancient borough of Southwark, and that in process of time, as the borough extended itself and the buildings spread into the adjoining manors, those manors became also considered parts of the "vill."

Architecture and Painting.

A painter designs his picture, happily for himself, with no thought of constructional or economical difficulties. The shadows which fall so easily from his brush must be constructed by the architect. The latter must see in his mind the effects which he intends to produce, and must build them up, not on canvas or paper, but gradually and painfully by the hands of others. If the result fall short of his expectation, he has no power of alteration, no facilities for heightening lights or deepening shadows. He must be an artist in his design, a man of science in its execution. His science, moreover, must be useful, not merely speculative. Architecture must not only please the senses, she has to justify her very existence by usefulness. Externally she may indulge in grace of form, limited only by the exigencies of climate, construction, and by durability. Internally she must accept the necessity of being bound to combine convenience and fitness with beauty. The arts of design and of building must not clash, but their combination should give a sense of propriety and repose. Architecture must then contrive and construct its artistic effects, remembering always that they must grow naturally out of the circumstances of each case, and that the greatest art conceals its mode of operation. Nothing can be worse than the obtrusion of details, obviously not required but for display, sacrificing the higher qualities of art to a pretentious fussiness. Without ornament, indeed, architecture as a fine art does not exist. Nevertheless, though ornament may be essential, it must be an integral part of that architecture, not a mere *appliqué*, like the beauty-patches of the court ladies of Lely or Kneller. It follows, therefore, that architecture must be studied by those who would practise it, both as a decorative art and as a useful science.

Iron in Fortification.

Many eminent scientific men have looked forward to the time when some material of greater resisting power than stone would be used in works of fortification. One of the most notable instances of this foresight is that of Paixhans, who, writing in 1829, devoted a considerable part of his valuable work, styled "Force et Faiblesse Militaires de la France," to a discussion of the use of iron in fortification. He did not see exactly how it could best be applied, but still he saw that sooner or later it must be used, and he argued by analogy as it were in its favour. He asked why, when a man wears a cuirass to ward off a certain blow, should it be an absurd idea to make a wall wear one so as to be proof against another blow, and whether a fortification of iron would be more strange than bridges of iron, ships of iron, factories and churches of iron, and above all roads of iron; and, he said, what material can be more suitably employed in striving to resist iron projectiles than iron itself? This author also mentions that Gustavus Adolphus proposed to fortify with blocks of iron, and that Daron wished to plate with iron his floating batteries against Gibraltar. And General Totten clearly contemplated the facing a whole work with iron, indeed, the construction of works of iron only, whenever the necessity should arise.

NOTES AND COMMENTS

EVERYONE who is acquainted with the streets around the church of St. Sulpice in Paris is aware of the importance of the trade in producing images and ornaments for churches. The style of the "art" is generally most unsatisfactory, but the works represent an enormous capital. It is commonly supposed that the images which are coloured so glaringly are of plaster or terra-cotta; but other materials are used. It appears that the whole of the oak beams which were found in the old Sorbonne have been utilised for some statuettes. The wood was old and close-grained and well adapted to be fashioned into shape by electric carving machines. For one lot of oak a sum of 30,000 frs. was paid. If the wood was left in its natural state or slightly stained the figures might be commendable, but colours and gold will be applied to them; some will be exalted by vestments and robes of costly materials while others will be adorned with wigs. The bedizenment is necessary, as the statuettes are intended for the South American markets. The Sorbonne was a sort of theological university, and the oak which RICHELIEU may have selected will accordingly be still devoted to ecclesiastical purposes.

If any accidents arise this year in the French cathedrals and churches, they are not likely to be expeditiously remedied. The buildings are, according to the law, public property, but the State is becoming a very unwise owner. Last year the sum assigned by the French Chambers for upholding the cathedrals was 1,080,000 francs, which was much under the average of preceding years. In this year's budget the sum allowed for the same work is only 355,000 francs, or one-third of last year's vote. The sum for churches and presbyteries has been reduced from 3,150,000 francs to 2,000,000 francs. There is a reduction in respect of diocesan edifices from 900,000 francs to 600,000 francs. The sums that are to be paid to the clergy are still more diminished, but we are not concerned with those items. If a priest's death should be hastened by insufficient means, another will be found to take his place. But when buildings even partially succumb to time and weather, unless reparation is immediately undertaken still further expense is entailed. Looking at the subject in its economical aspect, it is evident to all practical men that the resolutions of the French Government are unwise. But what else is to be expected from any party of men who have had no experience with property of their own, and cannot therefore be aware that buildings are not to be trusted to take care of themselves?

WE have already referred to the competition for an Evangelical church in Mayence, which was a fiasco. Five architects possessing so much experience in ecclesiastical buildings as to make them specialists were invited to prepare plans, but not one of their designs could be carried out for the sum proposed, viz. 35,000*l*. The church authorities then opened the competition to all Germany, or all Europe if desired, with no more satisfactory result. There are many grades of authority who have a voice in the selection of plans, and it is supposed that all the time it has been decided that the design of an architect who has taken no part in any of the contests will be executed. A resolve of that kind would not be in accord with old-fashioned German sincerity, but since Prince BISMARCK appeared on the scene many things are done which are supposed to be imitations of his diplomatic feats, but which at one time would have received a very different sort of designation. It will be a bad day for German architects if Bismarckism becomes an influence in arranging competitions.

WHEN it was known that Dr. CHARLES WALDSTEIN was a candidate for the Slade Professorship at Cambridge it was taken for granted that other competitors would have little chance of the prize. Dr. WALDSTEIN has been reader on classical archaeology since 1884. In the time that has elapsed he has done useful work, and has given an impetus to the study. In America he is no less esteemed, as was shown by his appointment as director of the American explorations in Greece. The Slade Professor is elected for

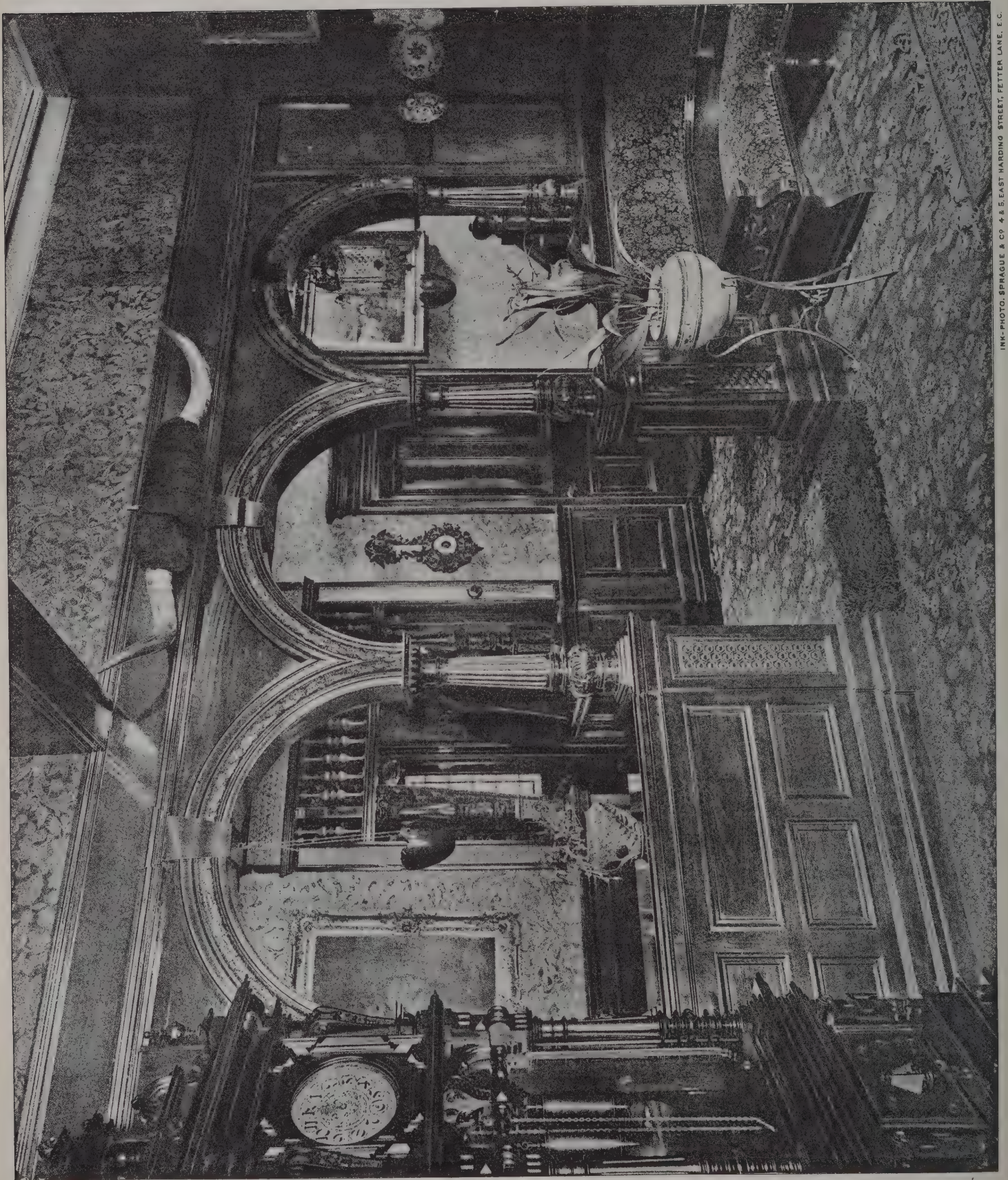
a term of three years, but is eligible for re-election. He is required to deliver annually in the University during full term a course of not fewer than twelve lectures on the history, theory and practice of the fine arts. The stipend of the chair is about 350*l*.

FRENCH critics have of late years instituted many comparisons between the Louvre and the National Gallery. They generally recommend that the officers who have charge of the pictures in Paris should be periodically sent to Trafalgar Square in order to become acquainted with the most effectual methods of displaying treasures. It is commonly supposed that the Louvre possesses countless masterpieces rolled up in the cellars and attics, which are concealed owing to the indifference of the curators. The truth is there is not enough wall space in the Louvre for all the pictures which the nation possesses. More satisfaction would be derived from it if a different arrangement were adopted. Hitherto history has been supreme, and it compels visitors to gaze on acres of canvas which afford evidence of the existence of many painters but without exciting the least pleasure. The Salon Carré shows what can be done by departing from the order of time and arranging pictures in the way that is most effective. That is the only gallery which many visitors care to behold. Another attempt of the same sort has been tried this week. The best works of the early Italian masters CIMABUE, GIOTTO, CARPACCIO, JOHN BELLINI, FRA ANGELICO, MANTEGNA, have been placed together and the result is a surprise. Most of the pictures seen are old residents, but hitherto they were overlooked amidst a crowd that was remarkable for age alone.

FOR a long time the financial condition of house property in Rome has been most unsatisfactory. There has been overbuilding, and the mortgage banks and other creditors, dissatisfied with the absence of return on their loans, have been putting up a great many houses for compulsory sale, although it is well known that purchasers are not likely to be present. In most cases, unless the houses are placed in some central locality, no tenders are forthcoming, and the upshot very often is that the mortgagees themselves finish by becoming the owners. It is no wonder that there is a tendency to panic in Rome, and a risk that buildings will be considered as the least profitable of investments. One of the companies that deal in house property has been trying to get up evidence to prove that there is much in Rome which should inspire hope. Buildings containing 3,850 lodgings and 975 shops owned or managed by the company have been adopted as a field of investigation. It was found that from the year 1892 to 1893 the premises unlet fell from 28.42 per cent. to 21.69 in the case of lodgings, and from 35.19 to 32.65 per cent. for shops. These figures show that on the whole there has been an advance; but they do not represent a uniform state of things, because in some parts of Rome there are scarcely any apartments empty, while in others they are very numerous. Upon every 100*l*. of rent due by tenants, 94.40 were actually collected in 1892 and 97.49 in 1893, which is another sign of improvement. The average degree of occupancy of the inhabitants of Rome is reckoned at .75 rooms for every 100 persons living in families, so that with a population of 450,991 inhabitants there would be needed 338,244 rooms, while their number amounts to 362,000. Not all of these are however actually tenable, because a good many lodgings are neglected or whole buildings are closed up by the owners so as to avoid paying the Government taxes, but the excess is self-evident and shows what a moderating effect it must have upon rents.

THE late RUDOLF SPRINGER, the German architect, whose archaeological investigations were appreciated by his countrymen, was a native of Frankfurt. From time to time he made many valuable presents to the collections of his native city. At his death he bequeathed several examples to the trade museum of Japanese pottery, lacquer and metal-work, especially of seventeenth and eighteenth-century date. These have been received and are now arranged in satisfactory positions.

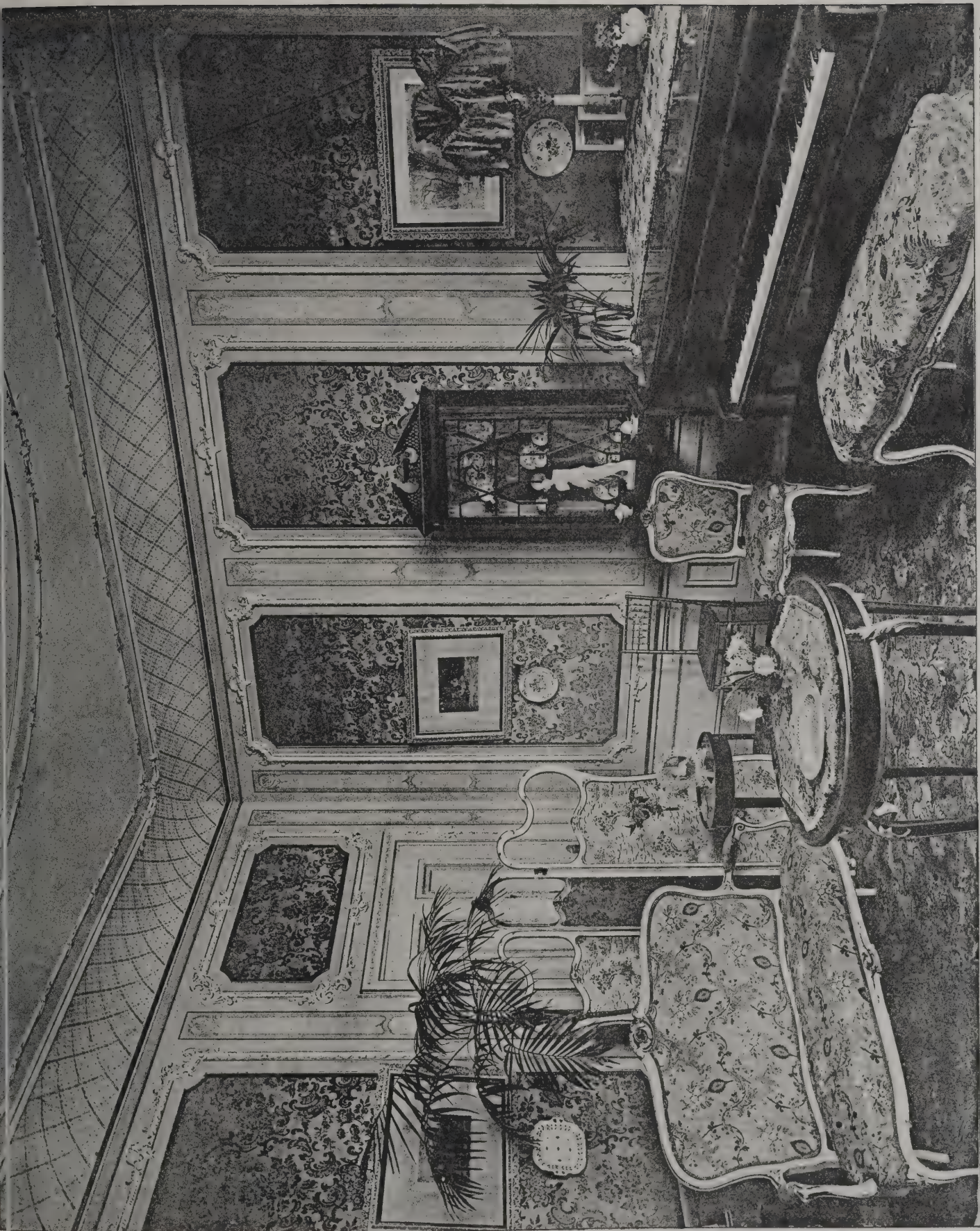
The Architect, Mar 1st 1895.



INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

SELBORNE HOUSE, HARROGATE.
T. BUTLER WILSON, B.A., Architect.





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SELBORNE HOUSE, HARROGATE.
THE DRAWING ROOM.
T. BUTLER WILSON, F.R.I.B.A., Architect.



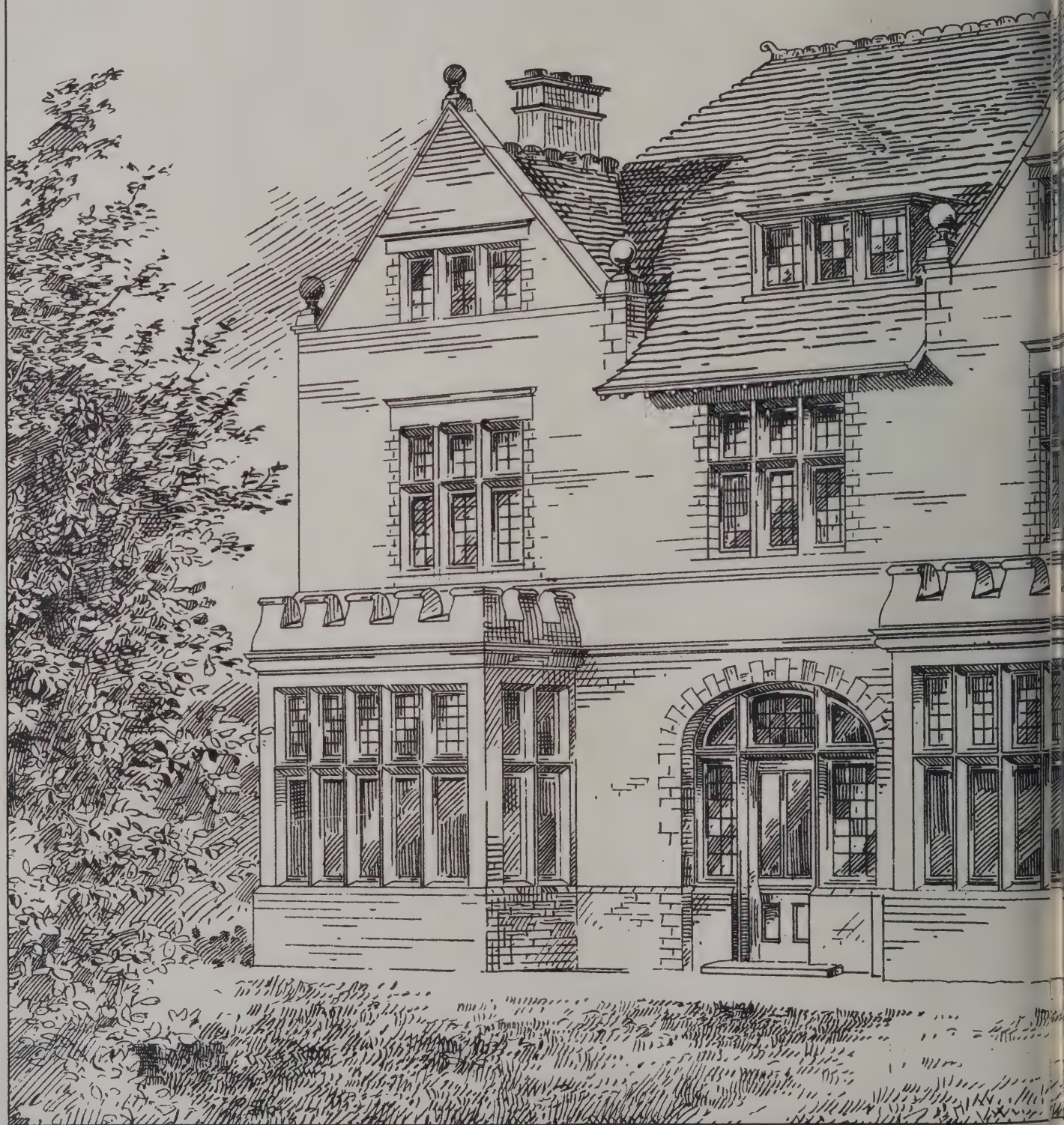
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SELBORNE HOUSE, HARROGATE.
THE DRAWING ROOM CEILING.
T. BUTLER WILSON, F.R.I.B.A., Architect.

PAINTED BY ROBERT P. OGLESBY.

Villa Residence Stourwood

— Messrs. Dancaaster & Taylor —
— Architects —





of 1

ILLUSTRATIONS.

SELBORNE HOUSE, HARROGATE.—THE DRAWING-ROOM.

SELBORNE HOUSE, HARROGATE.—THE DRAWING-ROOM.

SELBORNE HOUSE, HARROGATE.—THE HALL.

SELBORNE HOUSE, HARROGATE.—THE DRAWING-ROOM CEILING.

VILLA RESIDENCE, STOURWOOD.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute of Architects was held on Monday evening, Mr. F. C. Penrose, president, in the chair.

The deaths were announced of the following members:—Messrs. T. E. Bridgen, Arthur Lett and Ewan Christian.

The PRESIDENT proposed that the condolences of the Institute should be sent to Mr. Christian's widow and family, which was unanimously agreed to.

Mr. T. W. ALDWINCKLE read a paper, of which we give the following short abstract, on

Fever Hospitals.

Mr. Aldwinckle said he wished to preface the paper with two preliminary remarks. In the first place, very much in it as to the requirements of fever hospitals would necessarily apply to hospitals of all kinds, being general principles of sanitation; and in the second place, as they were at the present time only upon the threshold of the vast and intricate subject of provision for infectious diseases, the paper had been written rather in the spirit of inquiry than of dogmatism, not pretending to lay down hard-and-fast rules, but rather as offering suggestions, based to some extent upon practical experience, for the consideration of those who might be interested in the subject. It was difficult to overestimate the importance of the subject which they were to consider that evening. Infectious disease might be regarded as an invading and powerful enemy, ever ready to enter the dwelling or the city and to cause widespread ruin and destruction. Past history told us only too forcibly how powerful and destructive this enemy has been in times now happily gone by, when its inroads were unchecked by the fortifications of medical science and legislative provisions, and it was well within the province of architecture to lend her powerful aid to the researches and efforts of medicine in this defensive war against a common foe. The architect who would join in this humane crusade must, in order to be useful and successful, make himself intimately acquainted with the minute detail of the inner working of a fever hospital, and he could not do better than always bear in mind the following pregnant words from Sir Douglas Galton's book on "Hospital Construction."

"Cleanliness and fresh air do not so much give life as they are life itself to the patient. Cleanliness—clean air, clean water, clean surroundings—and a fresh atmosphere are the true safeguards against infection, segregation by ample floor and cubic space, ample ramparts of fresh atmosphere, rather than segregation by walls and divisions. You cannot lock in or lock out the infectious poison. You can air it, diffuse it and clean it away."

The general awakening of the public mind to the absolute importance of the isolation of persons suffering from infectious diseases was quite a recent one, as evidenced by the fact that thirty years ago there was in this country a complete absence of any organised system of infectious hospitals, and that London at that time possessed only two, viz. the London Fever Hospital at Liverpool Road, Islington, and the Smallpox Hospital at Highgate, both institutions being entirely supported by voluntary subscriptions. Some of the general hospitals received fever patients under conditions of very imperfect isolation, failing which infectious cases were sent to the workhouse, with results which can be easily imagined. As a natural consequence, the majority of patients suffering from fevers were treated in their own homes, and the general community lived on peacefully, utterly oblivious of the fact that infectious diseases were rampant in its midst, and only quickened into a slight sense of interest by occasional epidemics. The one great principle that an infectious case treated in its own home generally became a centre of infection had only been recognised by the few.

The Sanitary Act of 1866 first gave powers to the local authorities to build, or otherwise arrange for, permanent or temporary hospitals for infectious diseases, and these powers have been considerably enlarged by the Public Health Act, 1875, and the Isolation Hospitals Act, 1893.

The site should be, if possible, just outside the town or village for which it is intended. The question of transport of the patient was not so serious a difficulty as to outweigh the great advantages to be derived from the hospital having open fields rather than houses as its surroundings. Good ambulance arrangements would overcome all difficulties as to transport. The land should be capable of good drainage and there should be the means for a good and ample water-supply. The land should stand at a fairly high level and a gentle fall towards the south is a distinct advantage. If there were any trees on the site when purchased, those on the north and east boundaries, at least, should be left standing if possible. There should be two entrances to the hospital, one the "infected entrance" and one the "non-infected entrance," both controlled from the same porter's lodge. A wide roadway should run round the whole of the site, as a neutral zone to separate the hospital from the surrounding property. The axes of the ward pavilion should be as nearly as possible north-east and south-west, in order to provide for the maximum quantity of sunlight and the minimum of shade. This was of the utmost importance and should be carefully borne in mind in the selection of a site. The ward pavilions should not, where practicable, be of more than one storey in height. This might necessitate the purchase of a larger site than otherwise, but the compensating advantages were many. He did not suppose that any experienced hospital architect would, by choice, place fever wards one above the other, necessitating, amongst other evils, much traffic up and down staircases, to say nothing of the obvious objections from a sanitary point of view, so that considerations of land area can be the only reason. It was pointed out in this connection that the distance between the one-storeyed pavilions can safely be less than that between those of the two storeys, so that the expansion of the plan need not be so great as would at first appear. In the former case 50 feet will be sufficient, whereas in the latter case the width should not be less than twice the height of the pavilions, and would thus be not less than 65 feet. The whole of the several buildings of an infectious hospital should be completely isolated, and stand perfectly free, without communicating corridors or covered way of any kind. This was not suggested as an experiment, but as the result of personal observation in the case of several excellent hospitals, such as the Eppendorf Hospital, Hamburg; the Moabit Infectious Hospital, Berlin; the Frederichain Hospital, Berlin; the Urban Hospital, Berlin; the Belvidere Hospital, Glasgow; the Grafton Street Infectious Hospital, Liverpool. Others can be named, of which, however, I cannot speak from personal observation, such as the Epidemic Hospital, Copenhagen; the Ladywell Sanatorium, Salford; the Heathcote Infectious Hospital, Leamington, &c. It will doubtless be admitted that in an infectious hospital complete and absolute isolation of each ward pavilion, at least, is most desirable, and there should be good reasons adduced for in any way impairing such isolation by the introduction of communicating corridors, even with open sides. It was stated by some hospital authorities that these covered ways are necessary in order to protect the staff from the weather; but, apart from the fact that they are wholly inefficient for such a purpose, the authorities at the hospitals mentioned as being without corridors or covered ways all assured him that the staff experienced no ill effects or inconvenience whatever from their absence. The complete isolation of the buildings is recognised and prepared for, the nurses and others dress accordingly, and the arrangements for conveying hot food from the kitchen to the wards are so well considered and complete that the food is, in all probability, hotter when it reaches the wards than in the other cases. There should be a clear space of at least 3 feet between the underside of the ground floor of all wards and the adjoining yard level, and the space thus left underneath the floor should be paved with tarpaving or some equally impervious material, laid in such a manner that the rain-water shall naturally drain off the same. The ward pavilions for diphtheria or enteric fever should be separated at as great a distance as possible from those for scarlet fever. The isolation wards should be well separated from the remainder of the hospital. The official department and the kitchen and stores should be centrally situated, and the stores should be as near as possible to the "non-infected entrance." The staff quarters should be quite free from, and unsurrounded by, the ward pavilions or other infected buildings. The three classes of the subordinate staff in a large hospital, viz. nurses, female servants and male servants, should have separate and distinct homes, each home being under the resident control of the principal officer responsible for its discipline. The laundry should be as free as possible from the hospital proper and from the staff quarters. No infected building should be nearer than 40 feet to the boundary, nor to any other building, infected or otherwise, in the hospital. In the acquisition of a site for a fever hospital the question arises as to the number of beds per acre that can safely be provided. In the plan B, issued by the Local Government Board, the hospital of 8 beds is placed

upon one acre of land. For larger hospitals I do not think that the maximum should exceed 20 beds per acre. At the Belyidere Hospital, Glasgow, there are 17 beds to the acre; at the Grafton Street Infectious Hospital, Liverpool, 34 beds; at the Moabit Infectious Hospital, Berlin, 40 beds. The older hospitals of the London Asylums Board show a somewhat higher proportion, the Eastern Hospital having 40 beds per acre, the Western Hospital 36 beds, the South-Western Hospital 47 beds, the South-Eastern 42 beds per acre; while their hospitals recently built or now projected bear the following proportion:—North-Eastern 22 beds, Fountain Temporary Hospital 40 beds, Brook Hospital 16 beds, Park Hospital 28 beds, and the Fountain Permanent Hospital 19 beds per acre. The temptation was very great to raise the percentage of beds where the land is expensive, but it should be borne in mind that land is at once the cheapest and most permanent part of the expenditure upon a hospital. This question led to another and a very important one, viz. as to the maximum number of beds for which an infectious hospital should be built. The requirements of large towns necessitated the provision of a large number of beds; but it was an open question, most suitable for discussion, whether the aggregation of large numbers of acute infectious cases upon one site is desirable, and whether it would not be a preferable course to arrange hospitals for a smaller number of beds, and to increase the number of such hospitals in order to provide for the total number of beds required. As an illustration, if the population requires a provision for 400 beds, he would suggest the erection of two hospitals for 200 beds each rather than one for 400 beds; and where the required provision is for 750 beds, three hospitals of 250 beds each might be preferable to two of 375 beds. Indeed, a maximum of 300 beds suggests itself as desirable. It is usually less difficult to obtain sites for small hospitals than for large ones, and the hospitals being distributed would, in the case of large towns, render them more easy of access. For present purposes they could divide fever hospitals into three classes, viz. *a*, small isolation hospitals, suitable for groups of villages or small towns; *b*, hospitals not exceeding 100 beds; *c*, hospitals exceeding 100 beds.

English communities nowadays recognised the advantage of isolation hospitals as a means of preventing the spread of infectious diseases from persons who cannot be properly isolated in their own homes. But too often the provision of such hospitals is put off until some infectious disease is immediately threatening, or has actually invaded, a district. It cannot be too clearly understood that an isolation hospital, to fulfil its proper purpose of sanitary defence, ought to be in readiness beforehand. During the progress of an epidemic it was of little avail to set about hospital construction. The mischief of allowing infection to spread from first cases will already have been done, and this mischief cannot be repaired.

Large villages, and groups of adjacent villages, would commonly require the same sort of provision as towns. Where good roads and proper arrangements for the conveyance of sick have been provided, the best arrangement for village populations was by a small building accessible from several villages; otherwise the requisite accommodation for, say four cases of infectious diseases in a village might at times be got in a fairly isolated and otherwise suitable four-room or six-room cottage which has been acquired by the Sanitary Authority, or by arrangement made beforehand with some trustworthy cottage-holders, not having children, that they should receive and nurse, on occasion, patients requiring such accommodation.

In towns, hospital accommodation for infectious diseases was wanted more constantly, as well as in larger amount, than in villages; and in towns there is greater probability that room will be wanted at the same time for two or more infectious diseases, which have to be treated separately. The permanent provision to be made in a town should consist of not less than four rooms, in two separate pairs, each pair to receive the sufferers from one infectious disease, men and women of course separately. The number of cases for which permanent provision should be made must depend upon various considerations, among which the size and growth of the town, the housing and habits of its population, and the traffic of the town with other places are the most important.

For a town the hospital provision ought to consist of wards in one or more permanent buildings, with space enough for the erection of other wards, temporary or permanent. Considerations of ultimate economy make it wise to have permanent buildings sufficient for somewhat more than the average necessities of the place, so that recourse to temporary extensions may less often be necessary. And in any case, it is well to make the administrative offices somewhat in excess of the wants of the permanent wards; because thus, at little additional first cost, they will be ready to serve when occasion comes for the wants of temporary extensions.

Plans illustrating the sanitary requirements of small hospitals for infectious diseases were shown, and the principal hospitals here and abroad described at length.

Mr. Gordon Smith proposed a vote of thanks to Mr. Aldwinckle for his paper, which was seconded by Dr. McCrombie, and supported by Dr. Goodall, Mr. E. T. Hall and Dr. Downs.

Mr. Aldwinckle replied, and the meeting was adjourned.

WESTMINSTER AND ITS DIVISIONS.

WESTMINSTER is described in Domesday as a manor within the hundred of Ossulston, in Middlesex, pertaining to the church of St. Peter. The earliest account of its boundary appears in the charter of King Edgar, of the year 951, which is to be found in the original Saxon in Widmore's "Enquiry into the time of the foundation of Westminster Abbey," and of which reference the translation is as follows:—

"First up from Thames, along Merfleet to Pollen Stock, so to Bulinga fen; afterwards from the fen, along the old ditch, to Cowford. From Cowford up, along Tyburne to the broad military road; following the military road to the old stock of St. Andrew's Church; then within London fen, proceeding south on Thames to mid stream and along the stream by land and strand to Merfleet."

Such then, according to this charter, were the limits of Westminster in the year 951. Most of the names mentioned in it have been lost in the changes that have taken place.

"Up from Thames" can have reference only to the Thames at London. London at that time might be understood to have its westerly termination at the London fen mentioned in the charter. This fen probably assumed the name of Flete Dike in after times, in consequence of becoming contracted to a narrow channel by a progressive accumulation of soil. The boundary, according to the description in the charter, as is evident towards its conclusion, also commenced higher up the river than where it was bordered by the strand, at a part called Merfleet, agreeing with the marshy site of Whitehall, along which it proceeded to Pollen Stock. Pollen Stock may have been the termination of the high ground, near the river, on which the monastery was placed. The boundary then continued to Bulinga fen, which also agrees with the ancient marsh of Tothill Fields, reaching from the neighbourhood of the Abbey to the old ditch, now the King's Scholars' Pond Sewer; along which ditch the boundary continued to Cowford, and from thence up along the Tyburne stream to the broad military way, now Oxford Street. Thus far we seem precisely to follow the boundary described in the charter. It afterwards proceeded along the military road to the old stock of St. Andrew's Church, being in the line of Oxford Street and Holborn, and then took a southerly direction within the London fen, answering to the situation of the Flete Dike, to the mid stream of the Thames, and along that stream by land and strand to Merfleet, where the boundary commenced.

A subsequent description of the boundary of Westminster appears in the decree of 1222 for terminating the dispute between the Abbey and the See of London respecting the ecclesiastical franchise of the conventual church of St. Peter. Widmore observes that, "with respect to its exemption from episcopal jurisdiction, that we know was not fully adjusted till the year 1222;" and again, that "the precinct of the Abbey, and the whole parish of St. Margaret, at that time larger than at present, were declared exempt from the Bishops of London, and made a peculiar jurisdiction."

Of the prescribed limits in 1222 it may generally be remarked that westward they quite accord with the explanation given of those of the year 951; but that eastwards, towards the City of London, a great difference appears between the boundaries of the two periods.

The decree of 1222 is inserted at length in Wharton's "Historia de Episcopis," &c., the title declaring it to be concerning the exemption of the monastery of Westminster and of the parish of St. Margaret from the jurisdiction of the See of London.

It is declared in the decree that Westminster, then entitled the parish of St. Margaret, "begins, on the one part, from the water of Tyburne running to the Thames." This watercourse is still continued under the name of the King's Scholars' Pond Sewer, with little variation of its ancient line from the west side of Stratford Place. Stratford Place was the site of the Banqueting-house connected with the city conduits adjoining the ancient village of Tyburne, situate about the end of Marylebone Lane, where the line abuts on the north side of Oxford Street. After crossing Oxford Street, the watercourse proceeds along South Molton Lane, and along Bruton Mews, Bolton Row, and White Horse Street, into the Green Park, passing by Buckingham Palace and the west side of the ancient Tothill Fields to its outlet at the Thames, about a furlong west of Vauxhall Bridge.

In this decree of 1222, the boundary is described to be, on the other part, "as the king's highway stretches towards London to the garden of St. Giles's Hospital," which is pre-

cisely the present boundary of that part of the Westminster district to the east end of Oxford Street, "and thence as the way beyond the said garden extends to the boundaries dividing Mersland and the parish of St. Giles." This way, according to Parton, always passed from Oxford Street, bordering the hospital garden to the division of the Mersland, in the line of Crown Street, West Street and Castle Street. The boundary is continued "thence according to the separation of the gardens of Tholi and the monks of Westminster, to the house of Simon the weaver (saving the question of the monks of Westminster, concerning the land from that Simon's house to the chapel by the Church of the Innocents), and from the house of the same Simon, as the king's highway extends towards Westminster to the rivulet of Ulebrig running into the Thames."

Two circumstances mentioned here guide to the situation of Simon the weaver's house. The first is the piece of ground between the said house and the chapel by the Church of the Innocents, which was another title, according to Stowe, for the ancient church of St. Mary at the Strand. Noorthouck states that this church "was then situated on the south of the Strand, where the east end of Somerset House is placed." The other circumstance guiding to the situation is that "from the house of the same Simon" the boundary of St. Margaret's parish proceeded, "as the king's highway extends towards Westminster to the rivulet of Ulebrig running into the Thames." Ulebrig was the Ivy Bridge in the Strand, at the end of the present Cecil Street, and was the only bridge in the direction here mentioned.

A piece of ground, uncovered in Aggas's "Plan of London" in Elizabeth's reign, but now built upon, such as that represented to have been between the house of Simon the weaver and the chapel by the Church of the Innocents, occurs between Drury Lane, at the end of White Hart Yard, and Somerset House, and from the house of Simon so situated in Drury Lane to Ivy Bridge the direct way was nearly along that part which forms White Hart Yard and Exeter Street, and which at the period of the decree was probably part of a broadway in front of the Savoy, such as roads commonly were at that time, comprising the breadth now occupied by two streets. The sites of Burleigh House and of other buildings erected afterwards on the north side of the Strand were, probably grants of the large waste taken from the sides of the common way, when a regular road began to be formed along the Strand in the year 1353.

The declaration of the limits concludes thus:—"And so, whatever is contained by the Thames, on one part, and these bounds belongs to the parish of St. Margaret, except the church and cemetery of St. Martin. And beyond these before-mentioned bounds the districts of Knightsbridge, Westburne, Padyngton with its chapel and their appurtenances belong to the parish of St. Margaret aforesaid."

This decree entirely excludes from the Westminster franchise towards the east all the precinct of the Savoy and the entire parishes of St. Mary-le-Strand and St. Clement Danes, with the portions of the parishes of St. Andrew and St. Giles which were included within the boundary of 951, and it confines Westminster in 1222 to the then single parish of St. Margaret, at that time comprising, together with the existing parish of that name, all the present parishes of St. Paul, Covent Garden, St. Martin in the Fields, St. Anne, St. James, St. George, Hanover Square, and St. John the Evangelist. But westward, in addition to what was comprised in the charter of 951, this decree of 1222 declares the manor of Knightsbridge, Westburne and Paddington, all which were distant from the described boundary of Westminster, to belong to the parish of St. Margaret.

A further difference between the words of the charter and those of the decree, without causing any variation in the western limit, also claims attention. In the charter of 951 the boundary is said to be "by the old ditch to Cowford, from Cowford up, along Tyburne, to the broad military road." But in the decree the western boundary commences with "the water of Tyburne running to the Thames." This, if no change had occurred, would have been, according to the first description, the water of Tyburne running to the old ditch by the Cowford, the ford implying that there was then a continuation of the ditch each way. The difference between the words in the two descriptions is to be attributed to the old ditch being filled up towards the spot where it had at the earlier period been forded, and as, by the form of the land, the Tyburne stream could never have taken any other course than towards the old ditch near James Street, the ford seems to have been in the vicinity of the road which then led from the north by the line of the present front of Buckingham Palace. The old ditch appears by the form of the land to have continued eastward of James Street, passing along the low ground where now is the ornamental water of St. James's Park. The old ditch, by being filled up near the place of the ford, would be divided into two separate lengths; and the southern portion, receiving the water of Tyburne, would with it become a distinct water-course from the Tyburne springs to the Thames, as described in the decree of 1222.

It may be interesting to compare the descriptions of 951 and 1222 with the quantity of land which was comprised in Westminster at the time of the Domesday survey; in computing which quantity we must not be unmindful that there is much difference of opinion respecting the quantity contained in a hide of land. A hide is generally supposed to have been as much as was sufficient for the cultivation of one plough, and this is stated by some at less than 40 acres and by others as high as 120 acres. The measure of the hide probably varied, as was common at those early periods, according to the custom of different places. A similar mode of estimating the quantity of land is still practised in Greece between the proprietors and tenants of farm lands. The landlord there "provides each family on his estate with a cottage, a yoke of oxen, and sufficient seed for one Zengaria" (literally, yoke, used to designate an extent of from 50 to 60 acres in Eubœa, of 100 and upwards in Attica and other parts), the landlord taking a portion of the produce instead of a fixed rent.

In regard to the hide, an approximation of the average quantity may perhaps be obtained by examining a tolerably well ascertained manor in the same county containing a large number of hides. Such an opportunity is afforded in the manor named Stibenhede in Domesday, which comprised the present parishes of Poplar, Limehouse, Stepney, with its three hamlets of Radcliffe, Mile End Old Town and Mile End New Town, Shadwell, Wapping, St. George in the East, Whitechapel, Spitalfields, Bethnal Green and Stratford-le-Bow. It also appears to have comprised Bromley, which was environed by other parts of Stibenhede, and was not named as a separate manor in Domesday. This fact affords pretty good evidence of its having been extracted from the larger manor of Stibenhede subsequent to the Domesday survey, and afterwards given to the convent of St. Leonard by Sir Ralph Roseline, as he is named by Speed, or Josseline, as he is named by Newcourt.

The manor of Stibenhede is stated in Domesday to have contained 59½ hides, which are enumerated as follows, namely, 32 hides of land held by the Bishop of London, 5½ held by Hugh de Berners, 5 by the wife of Brien, 3½ by Ranulf Flambard, 1 by William de Ver, 1½ by Engelblue, 1½ by the Bishop of Lisieux, 1½ by William the chamberlain, 1 by Aluric Chacepul, 4 by Robert Fasiton, and 3½ by Robert, son of Rozelin, probably predecessor of Roseline, who gave the manor of Bromley to the convent of St. Leonard.

The map containing all the parts which composed the original manor of Stibenhede, on a scale sufficiently large and distinct for judging of their proportions, is that of London by G. & W. Greenwood, dated August 31, 1830. The quantity, as taken upon this map, of the land which constituted the manor of Stibenhede amounts to 4,763 acres; and this being divided by 59½, the stated number of hides in the manor, gives for each hide nearly 79½ acres. But, as exact agreement cannot be expected in estimating measures of these distant periods, it may be sufficient, for the present purpose, to consider the hide of this district to have contained, on the average, eighty of our present acres.

With respect to the manor of Westminster, it is stated in the Domesday register that the Abbot held thirteen hides and a half, which "was and is now in the demesne of the church of St. Peter of Westminster;" and that Bainiard, also in the same demesne, held three hides of the Abbot, making together sixteen hides and a half in the manor; which, in order to comprise the whole of the district contained within the prescribed limits of Edgar's charter, would require the sixteen hides and a half to contain nearly seventy acres each.

It is to be noted that the district of Westminster, as bounded in Edgar's charter of 951, was at the time of the Domesday survey surrounded by the manors of Eia, Lilestone, Tyburne, &c.; and that Knightsbridge, Westburne and Padyngton, stated in the decree of 1222 as belonging to the parish of St. Margaret, are not mentioned by those names in Domesday. Whether these were then portions of other manors it is perhaps not possible now to ascertain. According to Dart, Paddington occurs as an appendage to the convent of Westminster in a charter of King Edgar. He says also that King Stephen afterwards confirmed to them this manor, as did likewise King Henry II.; and that this manor with the rectory of the church continued in the possession of the convent till the time of the dissolution. Newcourt observes that at the dissolution of monasteries, King Henry VIII. in 1541 made Westminster an episcopal See, the church of St. Peter a cathedral, and Westminster a city, allotting the whole county of Middlesex (the parish of Fulham only excepted) for the diocese; and that King Edward VI. in 1550 dissolved this bishopric and restored the county of Middlesex again to the See of London. Newcourt further says that the manor and rectory of Paddington (which of old did belong to the monastery of Westminster) were by Edward VI., upon his dissolving the Bishopric of Westminster, given to the Bishop of London and to his successors for ever. Westminster Abbey was thus deprived of the manor of Paddington, together with the rectory of the

parish, but retained the manor of Westburne, which was within the parish of Paddington. The circumstance of the manor of Knightsbridge being also reserved to the Abbey and not forming a part of Paddington, accounts for its remaining annexed to the parish of St. Margaret, although considerably distant.

It is probable that after the Domesday survey, and previous to the decree of 1222, the part between the Flete Dike and Temple Bar had been separated from Westminster and added to the liberties of the City of London. The supposition that the Fleet was once the London fen was corroborated by an inspection of the spot where the remains of a steep bank were found at the side of Seacoal Lane, from the foot of which steps ascended to Green Arbour Court and Bishop's Court, both on the level of the Old Bailey, along which level the City wall passed in the line of Newgate. The summit of the step was about 20 feet above that part of Seacoal Lane, and from thence the descent to Farringdon Street (the line of the ancient Flete Dike) was about 16 feet, thus making the whole height from the level of Farringdon Street to the top of the acclivity about 36 feet. The level of the low ground having by the natural operation of time been much raised, renders it probable that the height of the bank had formerly been greater than has been stated. The distance of the steps from the middle of Farringdon Street was about 300 feet, and assuming that there was the same distance to a bank on the other side of Farringdon Street, the breadth of the fen between the banks would be about 600 feet. The most ancient causeway over the Fleet was undoubtedly that which was in the line of Ludgate; the other in the line of Holborn Bridge not having been requisite until, according to Stowe, an entrance to the City was made through the Newgate about 1135.

If the Baniard of Domesday was the Baron of Castle Baynard, the three hides held by him under the Abbot of Westminster manor would in all likelihood be in that part of the Westminster desmesne which lay nearest to the castle and which adjoined the Fleet; the three hides corresponding very nearly to that portion of the district affirmed to Westminster in Edgar's charter of 951 and excluded in the decree of 1222. Baynard, according to the quotation in Stowe's Survey, came to England with the Conqueror, and built Castle Baynard. His successors became chief bannerers of London, which makes it not improbable that a great part of what he held under the Abbot might in consequence of that municipal connection have been alienated from Westminster, and merged in the liberties of the City of London. Other considerable changes must have taken place soon after the Conquest, when, as stated by Leland, Matilda, Queen of Henry I., in 1117, founded the hospital of St. Giles in the Fields of London, with an oratory, which ultimately became the church of a parish of that name. The parish of St. Clement Danes is believed originally to have comprised, together with the present parish of that name, those also of St. Mary-le-Strand and the precinct of St. John the Baptist of the Savoy. That St. Clement Danes was appurtenant to Westminster in the time of the Conqueror appears by his charter of 1067 to the Abbey, wherein he "charges Hamo, his steward, with unjustly seizing on the church of St. Clement Danes in the Strand (violenter et injuste sibi usurpavit), and which he had himself caused to be restored." Newcourt says that Henry II. gave the church of St. Clement Danes to the Knights Templars, which, of course, took place prior to the end of his reign in 1189. The Abbey must then have been dispossessed of this benefice, and we find it wholly omitted as belonging to Westminster in the decree of 1222. Portions of the parishes of St. Clement Danes and St. Mary-le-Strand have, since the year 1222, been again annexed to the liberties of Westminster; but the exact period of the annexation does not appear to have been clearly ascertained. It was probably coincident with the subsequent establishment of the Savoy manor, formed out of the other portions of those parishes.

Widmore (who must be esteemed a valuable authority in consequence of having had within his reach, as librarian to the Dean and Chapter of Westminster, documents not generally accessible, and having been, as Nightingale observes, "more-over a man of learning"), says that "the famous Geoffrey de Mandeville, who distinguished himself at the battle of Hastings, mentions his having buried his first wife Athelais in those cloisters, and his intention to lie there himself;" and again, that "Athelais, the first wife of Geoffrey de Mandeville, and probably he himself too, was buried in the cloisters; in consideration of which he gave to the monastery the manor of Eye, between Westminster and Chelsea."

The manor of Eia, in Domesday, is said to be held by Geoffrey de Mandeville, and to have answered for ten hides. The space between the King's Scholars' Pond Sewer and the Ranelagh Sewer, from the Uxbridge Road at Bayswater to the Thames, measures about 890 acres, which would make ten hides of 89 acres each. Eia, after the date of Domesday, appears to have been divided into the three manors of Neyte, Eubery and Hyde; for in 1342 (15 Edw. III.) "Neyt" is named in a

special commission of sewers; and Widmore says that in 1362 Abbot Litlington "improved the estate of the convent at Hyde, now Hyde Park;" and that "Litlington died November 29, 1386, at the manor house of Neyte, near Westminster, at that time thought a good building, for the Duke of Lancaster, styling himself King of Castile, desired leave of the abbot to reside there during the sitting of a Parliament at Westminster." In the dispute which in 1592 was laid before Lord Burghley as High Steward of Westminster, concerning Neat and Eubery "farm towards Chelsea," being claimed by the inhabitants of Westminster as Lammas grounds, 108 acres are stated to lie in Neat and 430 acres in Eubery farm. To these there would be some addition of land not deemed to be Lammas grounds, which, with the Hyde manor, would together be the quantity rated in Domesday to the original manor of Eia. It appears by Widmore that the Hyde manor was not enclosed as Hyde Park until after it was obtained by Henry VIII. in 1536.

The Act confirming the exchange to the king of lands, some of which afterwards formed the portion of Hyde Park lying north-east of the Serpentine river, is the 28th Henry VIII. c. 49, and is inserted among the statutes of the Realm, published by the Commissioners upon the Public Records. The conveyance, as recited in the Act, is dated "the first daye of July in the 28th yere" of the king's reign; and by it the Abbot and convent transferred to the king the manor of "Nete," which is described to be "in the townes and parysshes of Westm' and Seynt Martyns in the felde;" also the manor of "Hyde" and the manor of "Eybury," with which last "Eye Brydge" is named. The Eye is also named in describing the Nete lands. "Conduyte mede" (on which Conduit Street and Hanover Square have since been built) is mentioned as being east of "Bryk close," belonging to Eyebury. Eye, as the name of a water-course (previously entitled the Tyburne), seems to have been derived from Eia, of which manor it was the boundary on the east side, from the Thames to the Tyburne Road. The name appears to have been afterwards converted into that of Aye Brook, which gave the corrupt name of Hayhill to the steep ascent on the side of the brook.

Nete, Eybury and Hyde must have been constituted manors out of the original manor of Eia, when, according to a common practice, as Sir Henry Ellis observes in speaking on the subject of multiplying manors, "the lord divided his manor, as the State had divided the kingdom, into two parts; the one he retained for his own support was partly cultivated by his villeins and copyholders and was called his demesnes [dominion], the other part was parcelled out among his dependants, who returned him their services. Such was the history and such the multiplication of manors in the times immediately succeeding the Norman conquest. The statute of Quia Emptores [18 Edw. I.] in 1290 put an end to their further increase."

The convent of Westminster obtained the manor of Eia, as Sir Henry Ellis observes, "close upon the time when the [Domesday] survey was taken," the gift of it by Geoffrey de Mandeville to the convent being confirmed by King William the Conqueror; yet it is remarkable that in the decree of 1222, giving the boundaries of Westminster (or of St. Margaret's parish, as it is there termed), the manor of Eia is not comprised within the franchise of Westminster, although that manor was situated between the described western boundary and other parts belonging to St. Margaret's parish distant from that boundary. An attempt to include the manor of Eye in the franchise of Westminster was resisted on the part of the Crown in 1345, as appears by an order "amongst the records of the Court of Chancery, kept in the Tower of London, (to wit) the Patent Rolls of the eighteenth year of the reign of King Edward, after the conquest the Third," for inquiring of lands which were of Edmond Barber, "in Eye, near Westminster, in the county of Middlesex," which lands, in consequence of his having been adjudged to be hanged for the murder of his brother, had been seized by the Abbot and monks of Westminster. No statement of the result was obtained, but it is quite clear that in 1536, when the manor was transferred to King Henry VIII., it was then deemed to be in Westminster and in the parish of St. Martin in the Fields, being so expressed in the Act, 28 Henry VIII. cap. 49, for confirming the exchange.

It has been shown that in 951 the district of Westminster extended from the Tyburne watercourse on the west to the Flete Dike on the east, the Tyburne Road and Holeburne being the boundary on the north and the Thames on the south, and that in 1222 the western boundary was the same Tyburne watercourse, while the eastern boundary excluded a part of what had been comprised in the charter of 951, viz. that portion of St. Giles and the whole of the parishes and places lying between the Flete Dike and the present parishes of St. Paul, Covent Garden, St. Martin in the Fields and St. Anne. On the north-west, beyond the boundary, there were also appended to the parish of St. Margaret the lands of Knightsbridge, Westburne and Paddington.

In 1393 a charter was obtained from King Richard II., in the seventeenth year of his reign, which is enrolled in the

Exchequer. It is affirmed in the charter that the Abbot, in right of his monastery, was seized of "the manor of Westminster, in the town of Westminster, and in the parish of St. Martin in the Fields, the blessed Mary of the Strand, and St. Clement Danes without and near to Temple Bar," which were by that charter so "declared, granted and confirmed," with all fines, forfeitures, &c.

The limits of the Westminster franchise were finally and more explicitly defined in letters patent of the second of James I. (August 3, 1604) to be "within all the aforesaid manor and city of Westminster, and within the [then] parish of St. Margaret there, and within the [then] parish of St. Martin in the Fields, and the parish of St. Clement Danes without the Barr of the Temple, London, and within the parish of the blessed Mary at Strand, then called the Savoy, in his county of Middlesex (the liberty and duchy of Lancaster excepted, and always reserved)." This constitutes the present extent of the city and liberties of Westminster.

The creation of St. Martin's parish, being an occurrence connected with the large addition of nearly 900 acres in the manor of Eia to the franchise of Westminster, is a subject intimately connected with the situation and extent of Westminster.

The parish of St. Margaret constituted the whole of Westminster in 1222, the manor of Eia not then forming any part of that parish. For creating the parish of St. Martin in the Fields, the larger portion of what had constituted the parish of St. Margaret was abstracted from it, thus contracting the northern limit of St. Margaret's to a line passing through the present ornamental water of St. James's Park to the Tyburne in its passage towards Tothill Fields. On the west side of Tothill Fields, the Tyburne watercourse passed from the Tyburne Road (now Oxford Street), and was in the whole of that length the boundary of the ancient parish of St. Margaret.

Maitland observes that the constitution of St. Martin's parish, as well as the foundation of its church, is involved in uncertainty. The church, with a cemetery, is mentioned only as such in the decree of 1222. This must therefore have been, according to a custom of that period, a church for the convenience of administering divine service to the neighbouring inhabitants, without any parochial endowment being attached to it.

In documents which were produced at a trial in the Court of King's Bench in the Hilary term of 1828, "Fenn against Golding and other Churchwardens of St. Martin's in the Fields," lands are described so early as the year 1225 as being in the parish of St. Martin of Charing, and afterwards others appear described as being in the parish of St. Martin in the Fields. It does not, however, seem to have been a confirmed parish until some time after 1306, which is the first date of the registry of the diocese of London. Newcourt, who was principal registrar of that diocese for nearly twenty-seven years, represents the registry not to be defective from its commencement in 1306 to the year 1337, but that no registry existed from the latter date until the year 1361, when it again appeared without being defective for the space of fourteen years. He states from this registry that in 1363 (fifty-seven years after its commencement) Johannes . . . was instituted vicar of St. Martin's parish on the resignation of Thomas Skyn. Skyn may have been the first or a succeeding vicar; but as neither his institution nor that of any previous person appears in the existing registries, the first institution of a vicar, originating with the regular constitution of the parish, must be concluded to have taken place during the period of the deficient registry, about twenty-three years between 1337 and 1361.

Widmore notices a dispute "concerning the right to visit the hospital of St. James," and states that "in June, 1342, a trial came on, and the jury gave a full verdict for the Abbot, inasmuch as it was within the parish of St. Margaret." This decision makes it appear that St. Martin's was not then so far a legalised parish as to take from these parts the parochial rights of St. Margaret's, thus reducing the period within which St. Martin's became a regularly constituted parish to about nineteen years, between 1342 and 1361.

It seems by the order of 1345 for inquiring of lands which were of Edmond Barber "in Eye," that this manor was not then an acknowledged part of Westminster; which is presumptive evidence (grounded on the belief that the lands "in Eye" were comprised in the parish of St. Martin when its confirmation took place, and as such became included within the franchise of Westminster) that St. Martin's was not an ordained parish until after 1345; thus again reducing the period within which it occurred to about sixteen years, between 1345 and 1361.

The last interval brings the time very near to the period at which Westminster became a considerable commercial mart by the attainment of the wool staple, which must have greatly added to its already increasing importance, consequent on the king's residence, and on the more permanent establishment there of the Parliament and the courts of law. These circumstances, added to the purpose of concentrating its newly

acquired privileges, might have suggested the design of giving this locality a distinct character, and by a regular constitution of St. Martin's parish, of contracting that of St. Margaret to the limit of the intended town of Westminster. The wool staple was fixed at Westminster by the Act 27 Edward III., s. 2, cap. 1; and it is probable the establishment of St. Martin's parish took place during the eight years between 1353, the date of that Act, and the reappearance of the registry of the diocese in 1361.

In Richard II.'s charter of 1393 the parish of St. Margaret is merely described as the town of Westminster, and the parish of St. Martin in the Fields is, with others on the eastern border of the same, declared to be wholly within the franchise of Westminster.

Still the precise line of division between the two parishes of St. Margaret and St. Martin, as well as what strictly constituted St. Martin's parish, does not seem to have been settled before the time of King Henry VIII. This may be attributed to an endeavour on the part of the monastery to have their various lands and other premises, which lay within the assumed circuit of St. Martin's parish, continued parcels of St. Margaret's parish, as they had been before the division took place. The following particulars throw considerable light on the subject.

The deed by which possession of Whitehall was given to the king is dated February 12, 21 Henry VIII. (1530), being a record in the Exchequer endorsed "York Place, Middlesex—a Recovery by Cardinal Wolsey."

September 5, 23 Henry VIII. (1531), is the date of a surrender by the Abbot and convent of Westminster among other premises of the lands which afterwards formed St. James's Park, described to be lying on the south side of the highway leading from Charing Cross to the hospital of St. James, and from the aforesaid hospital on the south side of the highway extending towards the west to the cross called Eycross.

In a letter of November 11, 26 Henry VIII. (1534) to the Abbot of Westminster the king says, "Our manor at Westminster ys nowe scite and sytuat as in the myddes of two p'shes. That ys to saye of Saynt Margaret where ye have jurydixon ordinary, and of Saynt Martyn in the Felde whe' ye be poss'ion's and prop'etaries." And in a letter of February 16, 26 Henry VIII. (1535) to the vicar of St. Martin's parish, the king directs that the inhabitants "dwelling from the Newgate of our manor of Westmynster shall be from hensforth taken for pyshoners of St. Martyn's, and there to here there devyne s'vice."

The Act 28 Henry VIII. cap. 12 (1536), declaring the limits of the king's palace at Westminster, states that the king "thereunto adjoining hath made a park walled and environed with brick and stone." And, in reference to the same in a patent dated March 21, in the thirty-third year of his reign (1542), the king, "in recompence of the Tythes, and other ecclesiastical rights, which the parish church of St. Martin's in the Fields, Charing Cross, in the diocese of Westminster, hath for ever lost by the imparking of certain farms and other titheable places situate in the parish of the same church," grants and ordains that all titheable places till then continued as parcels of the parish of St. Margaret, and being between the parish church of St. Clement without Temple Bar and the Palace of Westminster, together with the inhabitants thereof, should thenceforth be deemed to be of and in the parish of the said church of St. Martin's in the Fields.

By the following statement it appears that a considerable portion of the land which afterwards became St. James's Park was, prior to this change, within the parish of St. Martin, and there being an inconvenient intermixture of that and the adjoining parish of St. Margaret, within the king's manor of Westminster, directions are given that thenceforth the parish of St. Martin should be taken from the new gate of that manor. Sir Christopher Wren considered the King Street gate to be the new gate spoken of in the king's letter to the vicar of St. Martin's, but the style of that building denotes it of a later period than the date of the letter. In examining Fisher's plan of Whitehall Palace from a survey in 1680, there can be little doubt that the present parish boundary, commencing at Whitehall Stairs, situated as formerly by the river side, corresponds with a line that would pass through the principal entrance of the palace, as shown in that plan, and this very well accords with a conventional boundary running from the east in a straight line along the park to the Tyburne stream (at that time called the Eye) west of the park.

The Act of 28 Henry VIII. cap. 49, shows that the three manors of Nete, Eybury and Hyde, which had constituted the ancient manor of Eia, were in 1536 acknowledged parts of Westminster. They were probably made part of St. Martin's when it was regularly ordained a parish, prior to 1361; but the circumstance of their not having then been deemed to be within the franchise of Westminster may account for seeking Richard II.'s charter of 1393 to declare St. Martin's parish to be wholly included within that franchise. The

manors continued to form part of St. Martin's parish until they were constituted the separate parish of St. George, Hanover Square, in 1725, with a very small change in the eastern border of the Eybury manor, the parish of St. George being the last of the four abstracted from the parish of St. Martin since the restoration of Charles II. in 1660.

DRAWING FOR PROCESS REPRODUCTION.*

(Concluded from last week.)

ALTHOUGH for special decorative reasons, such as the Birmingham school rank so highly, it is quite possible to imitate a Dürer woodcut so as to deceive the very elect, there seems no particular virtue in so doing. Still if this be the object, it would be quite legitimate to draw it in white upon black paper, as indeed several artists of this school do. Such a method, they say, is more akin to hewing out the whites on a wood-block. This may seem a fanciful explanation, the truer one being that if you are working in this way you can hardly help simplifying your forms and endeavouring to get as much effect as possible with comparatively few touches. For this reason working in white upon a darkened ground is likely to keep the designer more near the spirit of the archaic school he desires to imitate.

Yet it is but fair to say that the one school of English art (since Constable) which has provoked the sincerest flattery of imitation from continental artists is the so-called pre-Raphaelite school, which in all its different manifestations, from Rossetti to Miss Kate Greenaway, from Blake and Mr. Walter Crane to the Birmingham school and Mr. Aubrey Beardsley, has already influenced French and German contemporary art to a considerable extent, while modern Holland and Belgium are entirely fascinated by its methods.

We are told that this decorative line is the only one that will accord with type, and stand in due relation as part of a perfect page. Granting this claim to the utmost, it seems to me you have only granted that a certain form of page has realised one perfect ideal of symmetry and proportion, which precedent has established as satisfying our taste completely. But that this ideal is the only one, and that beauty may not be sought in connection with any other page of type, with fine woodcuts, or even the much abused half-tone, is quite another question. Because many of us delight in the older ideal, and are quite willing to endorse all that can be said in its praise, I fear we are weak enough to allow all other ideals to be tacitly forbidden. It seems to me that if only an artist of authority would defend the modern page at its best, and point out where the type and illustrations at present failed to harmonise, and would analyse the question of vignettised as opposed to framed illustrations; would decide whether the rigid rectangle of the drawing with a set outline was or was not more pleasant in connection with the whole page than a vaguely softened outline straying, maybe, into the margin; and, above all, would try to formulate the most pleasant proportion of the face of the type to the illustrations, something might be done to establish a new ideal. Possibly, as the heavy line of the old woodcut accorded with the heavy and beautiful type of the period, so now with a more delicate scheme of illustration, relying upon the values of masses rather than upon lines, whether produced by fine woodcut engraving or the half-tone process, we must endeavour to use a lighter-faced type, perhaps more closely set together, to gain a silvery mass of grey rather than parallel lines of dark grey with vivid white lines separating them, which is the effect of the average page of type to-day.

For the art of drawing for process reproduction should, I think, find the artist keenly alive to the final presentation of his work. It seems a most desirable thing that he should be interested far beyond the receipt of a cheque from the publisher. Indeed, the future of illustration is only hopeful if we look forward to the co-operation of artist and art editor or publisher in a way undreamed of in the past.

It should be deemed absurd for a publisher to order so many drawings of a certain size without telling the artist the style of the book they are intended for. Or if they be destined for a periodical which more or less keeps a permanent standard of arrangement, then the artist should know before if he is to fill a whole page or half or quarter, as the case may be. He should know the type to be employed, the surface of the paper and the colour of the ink. If half-tone is to be used, he should be consulted on the reduction of his drawing, whether a coarse or fine grain is to be used, and, above all, in work of any pretension he should be allowed to select a decent firm of engravers, and to be assured that printers who understand the delicacy of the half-tone block are ultimately to be responsible for the production.

The mere mention of the printer is touching upon the most sore point of all, because there can be no doubt that he is at present the drag on the whole machinery. Good drawings are to be had, good blocks are to be obtained—but good printing in the modern style is, if not unknown, at least rare.

How far this is due to the ink, to the varying temperature of our offices, which are rarely heated thoroughly, is not easy to settle. Practical printers in America with whom I have discussed the subject frequently, generally attributed our non-success to one of these two reasons. Mr. De Vinne—as I said before—went further into the matter, and attacked our paper, ink, and above all our custom of using a yielding instead of a solid bed. He acknowledges that for such book printing as the Chiswick Press has turned out for so many years, England was still easily first.

When editor of an American magazine, it was my duty once a month to go down to the printer's and there, in the office itself, to see the pages upon the press, to look over the locked formes and suggest slight changes in position of the blocks, or alteration in their titling, and so to make a final attempt to bring the whole page into that symmetrical condition which defies all rules and can only be done by instinct. I wondered how much of the unsatisfactory state of English printing was owing to the separation of the various departments in publishing a book or periodical, which should be under one control. If the paper itself is ordered by one member of a firm, the blocks by another, while a third is responsible for passing the sheets, and the printer is allowed his choice of ink, his own disposition of the blocks—in fact, to put the impress of his taste on the work—can we be surprised that the result is not homogeneous? One mind should be apparent through a book or periodical. If it could be the artist, it would be ideally the best; but a number of artists must needs be employed on a single volume in certain cases, and as their time is too valuable to be spent on practical details outside their craft, even if one granted their agreement in these matters, there must needs be an actual art editor—not merely one nominally so-called, but a man fairly conversant with all those questions involved—one who could be trusted to consider every one of the thousand-and-one items which go to build up a beautiful book. The binding, the end papers, title-page to colophon, arrangement of blocks, every detail small or great—all should be in accordance with one standard of taste. If such a one were wise he would keep himself in touch with the artists who worked with him, and by informal conferences let them know beforehand such matters as would affect their drawings, and in turn obey their wishes as to the reduction of drawings, the placing them in the page and the style of titles to be printed underneath, and all these trifles which make or mar perfection; and, on the other hand, he should work in equally intimate relation with his printers and be a constant visitor to the machine-room, supervising all.

This may seem a side issue to introduce into drawing for process, but it is in ways like these that half the mischief lurks to-day. What is everybody's business is nobody's business; you may as well expect a firm to write a sonnet, as its members, acting independently, to produce a perfect book. One could name not a few magazines where money is apparently freely expended—where capable artists, good process engravers and adequate printing unite to produce a chaotic medley that seems to have no method in its muddle. On one page you see an idea of balance and a sense of "colour" in the disposition of type and process blocks, in the next the office-boy was apparently left to stick the pictures anywhere on the page and the printer told to fill up the rest with type. Of the constant intrusion of the photograph from life with all its unselected mass of detail, among reproductions of drawings, much might be said. The awful examples of certain American magazines that have illustrated fiction by photographs of posed models is only one step more in the direction of artistic depravity. For views, passing events and a score of other subjects the photograph is most welcome; but when it is set in rivalry to the artist even the most tolerant must protest. We object to an undue use of the costume model in paintings, but at its worst the custom is praiseworthy compared with the figure posed by way of illustrating poems or stories. In such a practice is surely the nemesis of ultra-realistic art—the realism that defeats its own end and becomes more hideously conventional than the worst efforts of romance.

Photogravure is too far removed from the subject to be more than touched upon here; the almost universal preference shown by artists for their pictures to be reproduced by this method in place of steel or copper engraving, mezzotint or etching, is sufficient to urge in its defence were any needed. In more sumptuous editions of late years it has been employed for the reproduction of wash drawings, but the result in many cases is not so far in advance of a good half-tone that it warrants the large increase of cost. For reproductions of engravings, pencil drawings and the like, it may be fairly claimed to be absolutely the best mechanical process.

Colour printing by process blocks is obviously upon us. Of the curious achievements wherein the colours are dissected

* A paper read by Mr. Gleeson White on February 5 at the Society of Arts, in the Applied Art Section.

by mechanical agency and the resultant negatives made into blocks and superimposed in three or more primary pigments, so as to yield a naturalistic effect of colour, silence is the kindest criticism. As scientific experiments they are most interesting; as commercial products they are very promising; but so far as art is concerned, the worst chromo is preferable so far, although there are not wanting signs of better things, such, for instance, as a reproduction of a water-colour sketch, given with the February *Artist*, reproduced by Messrs. Hare's process. Possibly, for patterns and reproductions of coloured drawings made with a view to their special requirements, they will become widely and not undeservedly popular. Then it will be necessary in any chat upon drawing for process to give a series of hints on the best pigments and their rightful limitation—for making originals to be reproduced in this way. But if we look around and see what has been done by woodcut printing in colours in the past, the Walter Crane toy books, or those wonderful Japanese prints which are an endless source of delight to Western minds, a hopeful future unfolds. Possibly the gradation of tint, which is the charm of much Japanese work, can never be hoped for from machine printing; it is the work of the artist craftsman, not of the machine, however deftly guided. Stippling is a poor substitute, and superimposed colours, except for bold work, like posters, has a peculiarly unpleasant effect.

If, however, we boldly accept the mosaic of solid colours, with or without those black separating outlines which govern a large mass of Japanese prints, and seem to be equally applicable to the decorative school of English art, it suggests a possible method that might even take its place among the ordinary commercial products of the day and yield excellent art. But for such printing as the earlier Walter Crane toy books, it seems to me that hardly anything has yet been attempted by process blocks. If we are intent to avoid superimposed colours and to be chary of stippled and mechanically-produced shades, good effects might be realised even by machine printing and cheap process blocks.

Like it or not, cheap and rapid colour printing is upon us. Paris has already its daily papers illustrated in colours. Regarded independently as a specimen of typography, this journal may not escape criticism. But when you consider that 6,000 copies an hour are struck off from a rotary press and 40,000 issued daily, it is astounding. The particular rotary machine which accomplishes this result is being duplicated for London, and I am breaking no secret in saying that by its aid popular colour printing in ways hitherto undreamed of will shortly assume a prominent place in journalism.

A modification of colour which consists roughly of two half-tones—the one prepared for the contours, the other for the modelling—has much to recommend it, especially for the reproduction of oil-paintings; so far the ideal seems to have been to imitate a colotype. Sometimes, as in a reproduction of a picture by Mr. Waterhouse in *The Studio* for January, a very fair rivalry results. Now a colotype—I speak after Mr. Frederic Hollyer, whose opinion is entitled to peculiar respect in such matters—is perhaps the best of all reproductions by mechanical means; that is to say, the next best thing to a good platinotype or a silver print. But it is far more costly and demands more time for its production. The advantage of this half-tone method is that it can be worked in conjunction with typography, not necessarily even on separate sheets. Therefore, this half-tone, printed in two shades, may have a not dishonourable future before it. And in the reproduction of paintings, indeed, if the artist properly understood its limits, there may be possibilities in it which would give to the half-tone more vigour and more atmosphere, and fit it for the illustration of modern books where high finish is demanded.

It has seemed unnecessary to refer to the triumphs of native process work, some examples of which, by the courtesy of various firms, are on the walls to-night. But a little time ago it was almost essential to send work abroad because of the unequal level of British blocks. Now there are several firms who can rival the best French or Austrian work, and each day sees a higher average in the better class work all round.

There is another question outside my text, as indeed most of this rambling discourse has proved to be, which should be taken up in earnest by some society of importance. I mean the preservation of the originals of the drawings produced literally by hundreds every week for our periodical publications. Some day we shall regret the carelessness which has already allowed so many to vanish no one knows where. Some few firms indeed sell now and again such pictures as have a certain independent interest of their own. But in almost every office of London at the present day piles of drawings are accumulating, some of which we have a right to expect will be not without interest to future generations. Who would not prize the originals of thousands of woodcuts of the days before photography, when the drawing perished in the cutting? Now this does not happen. Before it is too late one may hope that a number of contemporary drawings may be

rescued and preserved in some museum or gallery for future reference.

We must not, however, ask too much of contemporary periodical literature; not every fifteenth-century book is a masterpiece, not every etching, old or new, is a Rembrandt or a Whistler. If one in a thousand—one might say one in ten thousand—illustrations to-day find its future immortality in these ephemeral publications, we shall have a fair number to justify the existence of the rest. Nature is careless of a million failures so one survives, and art need not be expected to be more fecund.

Personally, it seems to me that the present period is for illustration what the Elizabethan was for lyrical poetry. There in a hundred books of airs you find words of songs any one of which might make the reputation of a poet to-day. So it may be that Mr. Pennell's anthology of pen draughtsmen will be to future students what "Tottel's Miscellany" or Mr. Bullen's charming anthologies are to students of poetry, priceless collections of the work of artists, many of whom would have been absolutely unknown but for this preservation of their ephemeral work.

Possibly this period will stand out not as the age of fresco, or the age of oil or water-colour pictures, but as the age of black and white illustration, which, for the most part done without thought of immortality, gained it unawares.

GREEK STUDIES.*

By P. MORLEY-HORDER.

AN architect's library can easily, nowadays, be usefully extensive, but if it merely consist of handbooks and illustrated and tabulated examples of fine buildings, it will be sadly uninspiring and incomplete—a reference library for personal convenience at most. In short, we want among our books, besides the usefully topographical, so to speak, the æsthetically suggestive. Such a book, for instance, as Fergusson's "History of Architecture" defines for us the various stages of our art; it is the geography of the subject—an attempt to set forth without bias the development of architecture from the earliest ages. Inspiring or interesting it almost ceases to be from very usefulness, and had it been either, and possessed of the fine flavour of literature, its reliability might possibly have been seriously impaired. For who could write with enthusiasm of the art of each age? Here, then, is a work invaluable for our information and the groundwork for our personal intuitions and impressions. The exact relative perspective of each style must, too, be exaggerated in a work of this dimension, when we consider how insidious is the connection that binds each smallest stage in the history of architecture. What we want more is that literary art which will make each age live more really for us, which will give us the *résumé* of the spirit that led up to each change and the very atmosphere that encouraged it. If the text-book tells quite accurately and indisputably how one style merged into another, it may do this to small purpose unless we at the same time instinctively feel this—unless the cumbersome facts are bound up together with a fine cord of consequence. This, as I have said, requires the artist imbued with the real spirit of the times, who from very affection consciously understands each tendency of the age he writes about. Such a writer as Ruskin, for instance, however bigoted and unreliable at times, can nevertheless tell us more about the essentials of the Gothic spirit when describing a small detail of one of its examples than all the text-books. Such books are a constant relaxation, and help us to realise and be reminded that our buildings have an informing spirit attributable to all sorts of external agencies—that they are not mere blocks of material. In fact, all literature that illuminates the past must necessarily throw light on the arts, and as being in itself but another branch of art should be cultivated for its own and refining influence sake. "Examine" is the cry everywhere, and just at present particularly so in the architectural world; and as it is impossible to reduce this instinctive knowledge of the real feeling of each age towards the arts altogether to paper, the tendency to be satisfied with this text-book knowledge is emphasised. Now, it is quite possible to have a very true feeling for this indefinable distinction of style unaccompanied with a sufficient knowledge of mere data to satisfy an examiner. With a very accurate knowledge of the characteristics of each style we may yet lack that larger interior knowledge no text-book can give. Important and essential as this exact knowledge is, it is lifeless and unprofitable without the vivifying freshness of the literary touch of the great writer.

The book before us seems an instance of real inspiring knowledge in the treatment of a particular art, and seems altogether a helpful book in the way I have tried to set forth. To turn for a moment from the book to the gifted

* *Greek Studies*. By Walter Pater. (London: Macmillan.)

author, whose death seems all the more untimely when we are told in the preface that the paper on Greek sculpture would have grown into a series, including one or more essays on Phidias and the Parthenon. The book as it stands is chiefly made up of essays that have appeared from time to time, but gathered collectively and forming the last volume of a series of critical art studies of priceless worth. Mr. Shadwell, in an admirably brief preface, emphasises, what an acquaintance with Mr. Pater's volumes so amply sets forth, that their merit cannot be summed up by describing them as consummate specimens of style. He points out, that his distinction does not lie in literary grace, fastidious choice of language and power of word painting alone, but in the depth and seriousness of his studies. The delicacy of insight and subtleness of interpretation, which with him seem an instinct, are the outcome of hard, patient, conscientious study.

The last three essays will perhaps seem of greater interest to readers of this paper, but all of them should tend to enlarge our ideas of that old Greek world which seems under his influence to grow less pagan, more full of human interest, and nearer than we ever could conceive to modern civilisation. The mythical elements were of greater import to the Greek mind than we perhaps thought; in fact, they become, when rightly studied, less mythical and more the expressive avenues of utterance for an imaginative people. We dare not question Mr. Pater's interpretation of these myths, so fascinating and consequential seems each chain of thought. Dionysus—perhaps to most of us only the vine-clad god—is indeed a god of larger meaning, the exponent of countless human feelings. "Yearly about the time of the shortest day, just as the light begins to decrease, and while hope is still tremulously strung, the priestesses of Dionysus were wont to assemble with many lights at his shrine, and there, with songs and dances, awake the new-born child after his wintry sleep, waving in a sacred cradle, like the great basket used for winnowing corn, a symbolical infant, or perhaps a real infant. He is twofold then—a Doppelgänger—like Persephone; he belongs to two worlds and has much in common with her, and a full share of those dark possibilities which, even apart from the story of her rape, belong to her. He is a Chthonian god, and like all the children of the earth has an element of sadness; like Hades himself, he is hollow and devouring, an eater of man's flesh—sarcophagus—the grave which consumed unaware the ivory-white shoulder of Pelops."

In this first essay we have, in Mr. Pater's own words, "an endeavour to present, with something of the concrete character of a picture, Dionysus, the old Greek god, as we may discern him through a multitude of stray hints in art and poetry and religious custom, through modern speculation on the tendencies of early thought, through traits and touches in our own actual states of mind, which may seem sympathetic with those tendencies."

The second essay deals with the Bacchanals of Euripides—"an example of the figurative or imaginative power of poetry, selecting and combining, at will, from that mixed, floating mass, weaving the many-coloured threads together, blending the various phases of legend—all the light and shade of the subject—into a shape, substantial and firmly set, through which a mere fluctuating tradition might retain a permanent place in men's imaginations."

A rather long but interesting quotation from the essay on the myth of Demeter and Persephone will best give some idea of the way Mr. Pater explains the gradual growths of these myths until they became an essential part of all Greek art and life. Based on no historical facts, but arising out of the natural spirit of man, and embodying symbolically his deepest thoughts concerning the physical and spiritual life, these myths have influenced all ages, and may still exercise a solemnising power over the modern mind—they may still exist for us and purify our culture.

"In the story of Demeter, as in all Greek myths, we may trace the action of three different influences, which have moulded it with varying effects, in three successive phases of its development. There is first its half-conscious, instinctive or mystical phase, in which, under the form of an unwritten legend, living from mouth to mouth, and with details changing as it passes from place to place, there lie certain primitive impressions of the phenomena of the natural world. We may trace it next in its conscious, poetical or literary phase, in which the poets become the depositaries of the vague instinctive product of the popular imagination, and handle it with a purely literary interest, fixing its outlines or simplifying or developing its situations. Thirdly, the myth passes into its ethical phase, in which the persons and the incidents of the poetical narrative are realised as abstract symbols, because intensely characteristic examples of moral or spiritual conditions."

Space will not allow of my quoting the application of this sequent evolution of myth to that of Demeter and Persephone, full of interest as it is. The Homeric hymn is the central expression of the literary grace and poetical phase of Greek mythology, whilst the marble remains, with which Mr. Pater deals in a later essay, are the central extant expression of what he describes as the ethical phase.

The "Heroic Age of Greek Art" has been imaged wrongly; it has too often been regarded as cold and lifeless. Mr. Pater finds the circumstance "that Greek sculpture is presented to us in such falsifying isolation from the work of the weaver, the carpenter and the goldsmith, an encouragement to such a manner of regarding it." Within the grey walls of the Louvre or the British Museum, "isolated from clear Greek skies," it is not surprising if the more sensuous aspect has been forgotten. Again, Mr. Pater reminds us that nothing remains, on account of the perishableness of their material, of "the curious woodwork, the carved ivory, the embroidery—coloured stuffs on which the Greeks set much store—of that whole system of refined artisanship, diffused like a general atmosphere of beauty and richness around the more exalted creations of Greek sculpture." A real conception of Greek sculpture cannot be formed without on the one hand connecting it with the "inner life of the Greek world, its thought and sentiment; on the other hand with the minor works of price—intaglios, coins, vases; with that whole system of material refinement and beauty in the outer Greek life which these minor works represent to us. It is with these, as far as possible, that we must seek to relieve the air of our galleries and museums of their too intellectual greyness. Greek sculpture could not have been precisely a cold thing, and whatever a colour-blind school may say, pure thoughts have their coldness, a coldness which has sometimes repelled from Greek sculpture, with its unexpected fund of passion and energy in material form, those who cared much and with much insight for a similar passion and energy in the coloured world of Italian painting."

GENERAL.

The Surveyors' Institution meets on Monday, the 4th inst., when the adjourned discussion on the paper read by Mr. Arthur C. Pain, C.E., on "Light Railways" will be resumed.

At the Students' Meeting of the Institution of Civil Engineers on Friday evening, the 8th inst., Mr. A. Struben will read a paper on "The Co-ordinate System of Surveying as employed in South Africa."

Mr. Walter Hanstock, of Batley, has been instructed by the Dewsbury Board of Guardians to prepare plans for alterations at the old infirmary.

Canon Egerton, at the annual meeting of the Shropshire Archaeological Society, read an interesting descriptive and historical paper on "The Parish of Middle," in which he stated that there are in the church three chained books of over 300 years old. He also showed an ancient seal and ring, which have recently been dug up in the parish.

The Commissioners of the Board of Manufactures have appointed Mr. Robert Gibb, R.S.A., to the vacant office of Principal Curator and Keeper of the National Gallery of Scotland, subject to the approval of the Government.

The Prescot Guardians have decided to order plans for the erection of a new infirmary at Whiston, at a cost of 35,000*l*.

Mr. R. G. Rice, F.S.A., will read a paper entitled "Notes on Huntington Shaw, blacksmith: his reputed work; his tomb, formerly at Hampton, Middlesex, and ironwork from the railing of the same," at the meeting of the Royal Archaeological Institute of Great Britain and Ireland on Wednesday, the 6th inst.

Mr. A. Hunter Crawford will read a paper, "The Suburban House," at the meeting of the Edinburgh Architectural Association on the 6th inst.

Mr. W. C. Howden, at the meeting of the Northern Architectural Association, read a paper on "Organs and Organ Chambers."

At a Meeting at the Mansion House, on Friday, of the committee formed to provide a suitable memorial of the late Field-Marshal Lord Strathnairn (Sir Hugh Rose), at which the Duke of Grafton presided, it was reported that the bronze equestrian statue by Mr. Onslow Ford, A.R.A., was now being cast, and, with its pedestal of Portland stone, would be in position at the selected site at Knightsbridge, at the junction of Sloane Street, by April 30.

A Private View of the Spring Exhibition of Pictures will take place at the Atkinson Art Gallery, Southport, to-day (Friday).

Professor H. G. Seeley, F.R.S., will this season give his annual course of lectures, in connection with the London Geological Field Class, at Wortley Hall, Seven Sisters Road, N. (adjoining Finsbury Park railway station), on the four Thursdays in March, commencing at eight o'clock—Subject: "The Nature and Forms of Hills and Valleys." Further particulars can be obtained from the general secretary, Mr. R. Herbert Bentley, 31 Adolphus Road, Brownswood Park, N.

The Architect.

THE WEEK.

THE quinquennial revaluation of property in the Metropolis is about to take place, and the finance committee of the London School Board are making arrangements in view of the appeals which may have to be made against the assessments of schools. The Court of Assessment Sessions in 1886 decided that the Board were to be considered hypothetical tenants, and that the cost of purchasing the land for erection of the schools was an element which might fairly be taken into consideration in assessing the schools, and further, that $3\frac{1}{2}$ per cent. on the value of the land and $4\frac{1}{2}$ per cent. on the cost of the buildings were fair percentages for ascertaining the rateable values. But recently a Conference on assessment procedure and practice was held, at the invitation of the London County Council, by representatives of the metropolitan assessment authorities, when resolutions setting forth the methods of computation which should be used throughout the Metropolis for fixing the assessments of various classes of properties were adopted. One of them was the following:—"Public buildings (including work-houses, vestry-halls, public libraries, schools, baths, wash-houses and hospitals) should be assessed at a gross value calculated at 4 per cent. on the present value of the land and 5 per cent. on the value of the buildings erected thereon." The percentages named in the resolution produce an assessment which is somewhat lower than that obtained from the Board's percentages of $3\frac{1}{2}$ on the value of the land and $4\frac{1}{2}$ on the value of the buildings for arriving at the rateable value. For instance, assuming the value of the land to be 1,000*l.* and the value of the buildings to be 1,000*l.*, then the assessment obtained from the Board's percentages would be 96*l.* gross value and 80*l.* rateable value, whereas from the percentages named in the Conference resolution, it would amount to only 90*l.* gross value and 75*l.* rateable value. As the representatives at the Conference possessed special knowledge of assessment matters in the Metropolis, the financial committee of the School Board are of opinion that the above resolution of the Conference may now be taken as a basis for the assessment of the Board's schools.

So few clergymen now take interest in the remains of Mediæval architecture in England, the death of Canon VENABLES on Tuesday is a loss to the country. He was in his seventy-sixth year. As late as February 17 he delivered a lecture in Toynbee Hall on Lincoln Cathedral, which in his eyes was a building of surpassing interest. Canon VENABLES was a zealous clergyman, and his ecclesiastical duties were never sacrificed to his hobby. We have published many of the papers he read on architectural and archæological subjects, especially those of the Lincoln district, which were all marked by as exact a knowledge of architecture as could be expected in an amateur; as well as sound judgment in drawing conclusions.

If, as is likely, the insuring of the safety of the Parthenon and other temples on the Acropolis will require costly works, the Greek Government will be justified in appealing to Europe and America for assistance. Athens has a claim on all civilised countries, which is not likely to be denied. But with international support there should be international supervision. The German architects who have succeeded in gaining a monopoly of responsibility are excellent men, but we see no reason why Frenchmen, Italians, Englishmen and Americans should not also be consulted on so important an undertaking as the upholding of the temples. Nor would the summoning of other aid add much to the expense. There are architects in England, as elsewhere, who would be proud to render honorary services. The Greek Government may be unable to act with the freedom that is desirable at such a juncture, but hitherto the partiality exhibited does not promise to lead to a successful consummation of the project.

THE forthcoming Berlin Exhibition has created a new subject for contention among the French painters. The question is again asked whether a Frenchman can send a picture to the Moabit Galleries without sacrificing his patriotism? As was to be expected, the Society of the Champs-Élysées has taken a different view from the Society in the Champ de Mars. The latter, in the person of the president, M. PUVIS DE CHAVANNES, says if there is to be war between the two countries let it be undertaken, but as long as Frenchmen prefer to live in peace, why should they not act towards the Germans as they desire the Germans to act towards them? It is supposed that the International Exhibition of 1900 will have a German section, and that will impose far more sacrifice than the sending of a few pictures to Berlin. Although it is delicately screened, the question is one of finance. The German amateurs will not purchase French pictures, and it is therefore waste of labour to display examples in Berlin. The older Society has had experience enough of the futility of foreign exhibitions, and accordingly hesitates about renewing the risks of taking part in any of them. In the Society over which M. PUVIS DE CHAVANNES presides there are younger men and creators of new styles. They are imaginative enough to suppose that the sight of their pictures in Germany will create converts to their innovations.

THE Emperor of GERMANY has determined on another attempt at the restoration of an antique statue. In the Old Museum is a *Dancing Mænad* or *Bacchante*, which is imperfect. The Emperor offers a prize of 2,000 marks, or 100*l.*, for a restoration of it. Every German artist is eligible to take part in the competition. All of them who care to make a trial can obtain a carefully produced cast of the figure for 30 marks. The result of the competition will be determined on January 27, 1896. The last attempt was made on an antique head, but the *Dancing Mænad* is a more ambitious work, and will therefore need finer skill to be properly restored. The exercise will be beneficial, for only in that way can the inimitable character of Greek work be realised. The Renaissance sculptors who restored so many antique figures were rarely successful, but the world has grown accustomed to their additions, and the incongruity is therefore less painful than it should be considered.

THE repetition of fires in Toronto was among the subjects considered at the late Congress of the Ontario Association of Architects. The following precautions were recommended:—"First, as great care as possible to be taken by isolation from the surrounding buildings either in space or by effective outside walls. Second, the introduction by the Corporation of Toronto of the London (England) Building Acts as to brick walls and other building appliances now in operation in the largest city in the world. Third, great care in the selection, as far as possible, of indestructible materials, and such as will stand the action of great heat and steam. Fourth, greater introduction of hydrants into any newly erected buildings. Fifth, careful general supervision. Sixth, special care in the heating and ventilation. Seventh, introduction of new methods by the architectural profession, such as automatic apparatus, &c."

EXCAVATIONS are about to be undertaken on the Hill of Tara by the British Archæological Association, with other supporters, under the direction of Mr. GEORGE PAYNE, the hon. secretary of the Kent Archæological Association. It is not anticipated that the Tara Halls, over which so many poets have rhapsodised, will be revealed. They consisted of enclosures of earth or mud, for the halls were open to the heavens. What is sought is simply the tomb of TEA TEPHI, a princess who is the subject of many legends. According to tradition, she was an Egyptian princess who found her way to Ireland, where she captivated HERMON, one of the numerous kings, who settled Tara upon her. It is proposed to excavate for a depth of 14 feet, and if nothing is discovered to sink shafts in other places. If the tomb is not revealed, something else may be met with to reward the archæologists. But as the princess has been mouldering for ages, her dust ought now to be considered sacred and left undisturbed.

PROFESSOR BLACKIE.

THE majority of the criticisms on the late Professor JOHN STUART BLACKIE which we have read have hardly done justice to a very remarkable man. He never seemed to grow old. Until his last days his figure was erect, his step elastic, his eyes as bright as if he had not reached his half-century. With so much vitality it is no wonder he felt as a young man, and attempted many things in a manner which shocked the lean and slippered pantaloon who had not reached his great age. They declared him to be eccentric, shallow and vain. As opinions of an uncharitable kind are sure to spread, it was gradually concluded that Professor BLACKIE was always eccentric, and his numerous writings were supposed to have originated in that quality.

There is no doubt that JOHN STUART BLACKIE was unlike the majority of professors. It was his business to teach, but if he lived to the age of the patriarchs he could never become a "book in breeches." At one time in England a schoolmaster who wrote a volume on the Greek particles was sure of a bishopric. BLACKIE would say there never was a Greek who occupied himself with a subject of that kind, and a scholar who devoted himself to it was less adapted to rule clerics and laymen than an old Athenian. The dead letter of literature was to him like dead things of other kinds—that is, to be avoided. Dr. JOHNSON considered the Greeks must have been as ignorant as Mr. THRALE's draymen, because they did not possess books. Professor BLACKIE, on the other hand, believed there was a better education to be obtained in the public places of Athens than in any of the Scottish or English universities. Knowledge that was embalmed in books appeared to him to be inferior to the words and acts of living men. Hence it was he startled scholastic proprieties by advocating that students of HOMER and ARISTOPHANES should spend a part of their time in Athens, for although they could not hear the winged phrases of the ancients, yet the talk in the streets of the city was preferable to any commentator's dissertation. Hence it was also that when he translated the "Iliad" he adopted ballad metre, for he felt that neither "Evangeline" nor the "Bothie of Tober-na-Vuolich," nor the numerous other experiments, can make the old heroic measure have the influence over the British mind which is desirable if the lines of the epic are ever to become household words. The old minstrels and SCOTT have made us associate the ballad with feats of broil and battle like those which HOMER describes, while such prosody as was adopted by POPE can never be identified with anything but moral essays. Professor BLACKIE probably felt he was never so vigorously preparing himself for his attempt on the "Iliad" as when he was learning the songs of German *burschen* and translating them in such a way that the English words could be used with the approved melodies.

It would be strange if a man who endeavoured to study and express Greek literature as if it were a vivid actuality should be neglectful of art. Generations of professors and scholiasts contrived to do so in all the colleges of Europe, but the reason was that Greek was accepted as no more than a collection of printed and written words, which for scholastic purposes need not represent sounds. We must remember that in his early manhood Mr. BLACKIE, as if he were to the manner born of a German student, undertook a long journey through Europe. In Italy his days were spent among artists, and from them so receptive an intellect was certain to receive impressions which were useful afterwards in many ways. He also practised drawing, which would help him in his efforts to acquire knowledge through what JOHN BUNYAN calls "eye-gate," and to test subjective subjects by endeavouring to impart a sort of objective form to them. Professor BLACKIE, in a characteristic way, began his treatment of art by an explanation of what the Platonic theory of beauty appeared to be to his mental vision. In the first place, he knocked down without mercy all the transcendental notions which have been supposed to be the only expressions of the quality. Like BURNS, he believed in a "sonsie" figure as the most perfect manifestation of beauty, for he wrote, "A full and well-rounded fleshly presentation is the natural and

only effective exhibition of a full and exuberant vital force." He was not guilty of self-admiration when he was writing about the effects of exuberant force, for the Professor was one of the thinnest of men. It was natural, however, that as he was endowed with enough vitality for half a dozen people, he should give the primary consideration to the motive power rather than to its effects. Mere statuesque beauty was of little account to Professor BLACKIE, unless he could trace in it the relation between cause and effect. He said, "It belongs to the order of nature, and to that finely-balanced system of significance between the inward forces and the outward shows of all existence, by means of which an expressive and cognisable world is made possible; and we have no more right to imagine this order of things reversed than to suppose that the planets might leap by lawless whim from their calculated courses, or the seed of an oak, when planted, grow into a gooseberry bush."

With a belief of that kind he could not believe in any one ideal of beauty or the repetition of particular types by an artist. According to the Professor, "The imitator of nature must know how to represent not merely her general types, but the endless variety of special modifications of those types so far as they by malformation or misfortune may not have sunk down into the domain of the ugly." The theory lends itself to what is now called realism in art, and it is remarkable that northern logic could find Platonic authority for such a result. Figures like those Professor BLACKIE admired would be interesting to all who were competent to trace in them the effects of certain hidden causes. In other words they would be symbolic, inasmuch as they would to the initiated stand for something else. The "full and rounded fleshly presentation" would recall a healthy atmosphere, nourishing food, adequate exercise, a contented mind and so on, all of which kept the subject from presenting an appearance of a different class. This recalling is, however, nothing more than an exercise of the association of ideas. Yet if there was one principle or notion among all those forming the stock-in-trade of philosophers which Professor BLACKIE abominated, it was that same association. ALISON and JEFFREY, who built a theory of beauty on it, would, we fear, obtain rhadamanthine justice if the Professor could have the settlement of their destiny. In all this Professor BLACKIE was only demonstrating his human nature by its contradictoriness. He hated association, and there is hardly a problem he advanced concerning art which does not depend upon it. The principle of association can be abused like all else that is good, and it has been made a sort of general utility actor whenever there is a difficulty in accounting for any of the scenes in the drama of life, but within its own sphere it is effective.

Professor BLACKIE's way of looking at buildings exemplified the power of association over him. With his affection for vitality it was only natural that his thoughts should run to the old builders at the sight of their work. An ordinary writer would trace the progress of architecture by saying first came the lintel, next the semicircular arch, and then the pointed arch, as if lifeless forms possessed a power of evolution. Professor BLACKIE in the following passage gives the prominence to the builders:—

The Egyptians and the Greeks—not from any historical connection that is either probable or provable, but following a natural instinct and a plain law of early construction—adopted the horizontal as the dominant line of their architecture, of which, combined as it was with substantial masonry, stability, solidity and permanence were at once the expression and the effect, and this feature the Egyptians wedded to the sublime and the Greeks to the beautiful, in a fashion and to a degree that no other nation has been able to surpass. After this the Roman builders—unless, indeed, they were content to remain servile copyists—had two courses open, either to strike out a new line altogether by means of their great instrument the arch, or to give the Greek parallelogram an altogether new character, by taking the triangular line of the pediment as their type, turning the obtuse angle of the apex into an acute, and repeating this feature on two or three platforms, so as to make a certain aerial lightness and elevation, not weight, mass and stability, the dominant expression of the whole. In the former case the Byzantine temple (of which St. Sophia at Constantinople and St. Mark's at Venice are the most familiar examples) was the result; the other style culminated by various gradations into the Gothic.

When he saw one of the great Egyptian temples his wonder was not restricted to the quantity of stone before his eyes. He thought of the men who displayed such appreciation of the principle of magnitude, and who contrived to be graceful when employing masonry on the

largest scale. And then, as he dwelt on the power of the Egyptians who could plan and execute colossal works, the Professor was able to realise that they were not such miserable idolaters as they are described to be whenever it is considered necessary to improve the occasion of a visit to Egypt under clerical auspices. To his mind great activity in any of the arts asserted a remedial influence over men, and from what he knew about the Egyptians he was able to imagine that their decoration was as inspiring as the "Iliad" to the Greeks.

What these titanic structures speak to us, addressing as they do only our æsthetic sensibilities, falls infinitely short of what their significance must have been to the loyal and religious spirit of the ancient Egyptian. Here on these walls, which to us are only scrawled with strange human figures, monstrous gods and alphabetic symbols, to all but a few of the curiously learned as mute as the stones on which they are chiselled, the citizens of the great city of Ammon read with reverent awe and patriotic admiration the offices of their most revered deities and the virtues of their most famous monarchs. These walls, in fact, stood before them constantly in bright public display, as at once the Bible of their faith and the "Iliad" of their history. Nor was their faith, as painted or symbolised on those long lines of significant wall, anything of which, as compared with other polytheistic peoples, they had any cause to be ashamed. Gods with the heads of cows, dogs, cats, crocodiles and hawks of course appear strange and belike ridiculous to us; but this is only because we ignore their symbolism, and are un instructed in their significance. Let any man only consider what a part animals have played in the symbolism of human thought, from the fables of Pilpay in the East to Esop in the West, and he will understand that the cats and the crocodiles, the hawks and the bulls and the dogs of old Egyptian religion did not receive the pious homage of their worshippers without a cause. The error consisted—and it is an error which makes their sublime shake hands only too familiarly with the ridiculous—in confounding the symbol with the thing signified, and in making an incarnation of what was originally only a typified function.

He was less satisfied with the representations of the Etruscan painters because there was no guide, no Rosetta stone to suggest the meaning of the artists. But what he saw of ancient art in Egypt, Greece and Italy, made him grieve when he contrasted it with what he saw in his native country. Professor BLACKIE was one of the severest censors of those Scottish clergymen who used to regard the arts as demoniac agencies. If there is a difference in the character of the churches, and the architect's work is considered to be as orthodox as the village mason's, the change is in some measure to be attributed to the Professor's influence. Nor was he less opposed to laymen's buildings when they were set up without any thought of the debasement of the landscape. There was no man who was better acquainted with Scotland, for he was a confirmed pedestrian, and when a hotel or hydropathic establishment, having as much architectural form as a packing-case, was erected in one of the picturesque spots, it caused him pain which he could not endure in silence. Many a bitter letter was penned by him on the subject.

Professor BLACKIE might refer to himself as an example of his theories of knowledge. If he devoted his long life to the niceties of scholarship he would have come nearer to the ideal of a professor as it appears to the majority. He believed, however, that scholarship is barren unless it leads to action, and accordingly his exertions for various purposes were untiring, and generally they were profitable to his countrymen.

THE LATE HYDE CLARKE ON COLOUR.

THE late Hyde Clarke, who died a few days ago in London was known of late years as a financier. He was also an erudite student of the science of language. Between fifty and sixty years ago he had gained a reputation of another sort. At that time he was a prominent writer on engineering and architectural subjects. He was, too, one of the pioneers of technical education, and we believe he took charge of a class for colour decoration. One of his papers on colour may be considered to have some interest, especially as in it Mr. Clarke broached the supposition of a relation between colour and electricity.

At the present period, when so much interest is excited as to the decoration of our public buildings, and when a better epoch for this department of art seems opening, the subject of the laws which regulate it can scarcely fail to be attractive to the profession. I should first wish to call attention to M. Chevreul's theory of contrast, with some few remarks I have to make upon it. M. Chevreul says that where the eye sees at the same time two contiguous colours it sees them as dissimilarly as possible, both as to their optical composition and

as to the depth of their tone, so that there may be at the same time simultaneous contrast properly so-called and contrast of tone. Thus if two colours *a* and *b* are in juxtaposition they will differ as much as possible from each other when the complement of *a* is added to *b* or the complement of *b* added to *a*. If we choose for our experiment orange and green, and if we place orange by the side of green, blue, the complement of the orange, is added to the green, which thus becomes more blue and less yellow, and so similarly the red, the complement of green, is rendered more vivid in the orange, which also becomes less yellow. M. Chevreul has not suggested the cause of this remarkable phenomenon, but I am myself inclined to attribute it to a tendency which the colours have to balance each other in a manner like to that in which heat diffuses itself from a heated body to one of a lower temperature and similar to the law of electrical distribution. If this should be the case it would also be confirmatory of a homogeneity of colour, which many other circumstances would lead us to believe, so that light, instead of being considered to be composed of three simple coloured rays, would, according to that view only, owe the phenomena of colour to the different arrangement of its particles, as ponderable substances, according to the arrangement of their molecules, vary their forms. Colour, perhaps, after all is only dependent on electrical action, and could we establish this our way would be clear to the production of coloured representations by electricity, instead of the present daguerreotypes and to many of the operations of dyeing.

Pursuing his remarks, M. Chevreul says that it is evident that the phenomena of simultaneous contrast would increase the brightness both of *a* and *b*, and make them appear more brilliant than they would when looked at isolatedly. If the colours brought together belong to the same group of rays, and only differ in intensity, the clearest in tint will appear still clearer at the point of contact, while that deepest in shade will appear deeper, the tints will be regularly affected from the point of junction, the one set lighter and the other deeper. Coloured and white bodies, when put in juxtaposition, become, the former more brilliant and deeper, and the latter of the complementary colour of the others. Thus green and white: red, the complement of the green, is added to the white, and the green appears deeper and more brilliant. In the juxtaposition of coloured and black bodies the effect of the contrast of intensity is to deepen the black and lower the tint of the juxtaposed colour; but a very remarkable fact is the weakening of the black itself, when the juxtaposed colour is deep, and of such a kind as to give such a bright complementary colour as orange, yellowish orange, greenish yellow, &c.; for instance, with blue and black, orange, the complement of the blue, is added to black, the black becomes lighter, and the blue is clearer, perhaps greenish. All grey bodies contiguous to coloured bodies may present the phenomena of contrast in a manner more sensible than white and dark bodies do. Thus yellow and grey: the grey takes more of a violet cast by receiving the influence of the complement of the yellow, and the yellow appears more brilliant and yet less greenish.

Besides this simultaneous contrast of colours, M. Chevreul distinguishes a successive contrast of colours, by which he means all those phenomena which are observed when the eye, having for some time looked on one or more coloured objects, perceives after having ceased to look at them images of these objects presenting the complementary colour which belongs to each. He also defines a mixed contrast, which is the result of the two others; it takes place when, having looked at a red paper, for instance, and we turn towards a blue, it will appear greenish; if, on the other hand, we look first at the blue and then at the red, the red will appear orange. These are all well known phenomena, but M. Chevreul makes a practical application of them; he recommends the painter not to keep his eye too long fixed on his model, and the purchaser of coloured goods to be similarly careful if he wishes to keep his eyes in a normal state to look at the last pattern, otherwise the several patterns will, after the first, appear faded and less fresh in colour, although they may all be of the same quality. A shopkeeper who shows several silks, say red, should show others of a complementary colour, green in this case, in order to restore the eye to its normal state, and better to prepare it for the red, by making the red look more brilliant than it really is.

I shall now make another halt to give a hint to those of my readers who consult French works as to the use of several words used by the authors; thus, *ton* we call intensity, tint and shade, *gammes*, the key colour or tone, and *nuances*, hues. Two or three useful rules I shall also advert to here. The best contrast, it must be remembered, is produced by the complementary colour, and all colours must be of the same intensity.

When two colours do not agree it is best to separate them by white. Black is also useful for this purpose when applied with bright colours, and, in some cases, preferable to white.

Black may be advantageously applied with sombre colours and with some of the dark tertiaries.

It will now be necessary to consider the several colours separately, in doing which I shall principally avail myself of Mr. Hay's work on colour, the best and cheapest practical work on the subject, and one which to the professional man and to the student is indispensable.

Like Mr. Hay I shall begin with white, the representative of light, which is regarded as produced by the reflection of the three primary colours simultaneously in their relative neutralising proportions. Although there are eight kinds of whites, there is only one which is understood as a pure white. Its contrasting colour is black, being opposite to it in the scale, but the arrangement in which its effect is the most happy is with blue and orange. In the series it lies nearest to yellow, which may be adopted as its melodising colour. With nearly all colours, however, it harmonises in conjunction and opposition, and to its properties in separating two discordant colours I have already referred. It does not agree so well as grey with red and orange, and with blue, violet, &c., it is harsh. It is to be preferred to grey with yellow and blue, also with red and green, red and yellow, orange and yellow, orange and green, and yellow and green. With very light primrose, yellow forms an agreeable arrangement. All colours brought in contact with pure white must be light and cool, amongst which grey and green may be employed and intense or rich colouring must be avoided. A south light is the best for white, which, when it is the predominating colour for a room lighted from the north, should be made of a cream colour, so as to get rid of the cold reflection as far as possible.

French white is, properly speaking, the lightest shade of purple, and is seldom used in house painting, but Mr. Syme says that he has seen it made the prevailing colour of a drawing-room in a country residence with good effect. It can only be introduced when all the other colours are light and cool in tone, as any quantity of intense or rich colouring completely subdues it.

Black, the representative of darkness, is regarded as produced by the absorption of the three primary colours, simultaneously in their relative neutralising proportions. In the series it lies next to purple, which may be considered as its melodising colour. Its contrasting colour is white, we may also add yellow, but it is most happy in combination with red and green, red and yellow, orange and yellow, orange and green, and yellow and green. By being associated with sombre colours, such as blue and violet, and with the lower tints of the bright colours, it may be often made to produce a very good effect. It is always happy when used with two bright colours, as orange, yellow, red and bright green. As a separating colour it is often to be preferred to white. It is not so good as grey in combination with orange and violet, green and blue, and green and violet. It is only in arrangements of a cool and sombre character that it can be used in large quantities, and it is recommended to be used always pure and transparent. The ancients used it happily and in great profusion, and in the monuments of the Egyptians, the vases of Greece and Italy, and the decorations of Pompeii and Herculaneum. We find it in combination with the brightest colours, often used as a separating colour or as a contrast, and always with effect. Mr. Hay recommends great caution in the use of both white and black, for being at the top and bottom of the scale they are very dangerous colours to manage. Where gorgeousness is the object, they must not be brought in.

Pure yellow, of the power of 3, which Mr. Hay calls yellow jasmine or a deep lemon hue, is the lightest of the three primary colours and the nearest to white. Its contrasting colour is purple and it forms a strong contrast to black. Its melodising colours are orange and green, which are the secondaries it forms with red and blue. Its ternary is citron, and its quaternary is brown and marrone. Being the most powerful of the primary colours, it is most offensive to the eye when used extensively in a pure state. With red, orange or green, it does very well in combination with black and even with grey. In artificial light yellow, it is well known, appears to be of less intensity, as is the case with all colours into the composition of which it enters.

Primrose, which is a very light yellow, forms a pleasing arrangement with pure white, being a light and cool colour.

Red, of the power of 5, is, by Mr. Hay, represented to be of the most intense geranium colour, and as difficult to be defined. It is the second of the primaries, a very warm colour, and the most positive of all colours, pre-eminent among them. Its contrasting colour is green. The secondaries with which it melodises are its combinations with yellow, forming orange, and with blue, forming purple. Its tertiary is russet and its quaternary is marrone and slate. With another bright colour it forms a good arrangement with black, as it does also when combined with yellow. Being a warm colour, it acts upon all colours brought in contact with it or into which it enters, and must not be used on a large scale uncombined, requiring great skill in its use. It is heightened by artificial light. It is considered to be an excellent key colour, and, when so used, it is recommended that its contrasting colour,

green, should be neutralised by being brought down in tone towards olive.

The nearest hue of red towards yellow is scarlet, which is very brilliant, and requires much the same management as orange. It must never be used in large masses, except under very peculiar circumstances. Its contrasting colour is a bluish green. The ancients used black with scarlet.

The nearest hue of red towards blue is crimson, one of the most gorgeous, at the same time most cool and mellow, and very useful as a key colour. Its contrasting colour is a citron green, and its melodising colours a bluish green and reddish purple.

Pink is the next hue after crimson, and is very useful for heightening reds in cool-toned arrangements.

Blue, of the power of 8, is the deepest of the primary colours, and the nearest in relation to shade. It is a cool colour, acting upon colours used with it, and may be employed in masses with much less glare than either of the other primaries. Its contrasting colour is orange. The secondaries with which it melodises are its combinations with yellow, forming green, and with red, forming purple. With green, however, blue is very discordant, more so than any primary with its secondary. Its tertiary is olive, and its quaternaries slate and marrone. With orange it makes a good arrangement with white, and with green agrees with grey, and with violet it enters into composition with black. Black may be very advantageously used with it under many circumstances. White and blue are apt to appear raw in contrast. When used with green and olive, on account of the discord blue requires the interposition of grey or of some other neutral colour; with olive a purple grey may be used. Blue is reckoned a good key colour where a refreshing appearance is desired; with artificial light, however, it is chilled. We now come to the secondaries.

Orange is a compound of yellow 3 and red 5, being of the power of 8. It is one of the most brilliant colours there is, and the contrast to blue; it requires therefore to be used with a sparing hand, although it is reckoned a good key colour. Olive also forms a contrast with it. It is the melodising colour to yellow and red, and is itself melodised by its tertiaries, citron, formed with green, and russet with purple. It is acted upon by artificial light much in the same way as yellow is. With blue it may be combined with white, and with red, yellow or green may be used with white or black. With more yellow the hues orange forms are gold, giraffe, &c., and it then requires for its contrast purplish blue.

Green is the coolest of the medium of the secondaries, and is composed of yellow 3 and blue 8, being of the power of 11. Its contrasting colour is red, and also russet. Green melodises with yellow and blue, and is itself melodised by the tertiaries citron, formed with orange, and olive with purple. It is one of the worst colours under artificial light. With red, orange or yellow it may be used in composition with black or white, but with blue or violet grey is to be used. Being such a soft colour, green may be used in quantity without fear. It requires great care when used with blue, and should be separated by a neutral tint.

Purple is one of the darkest colours most nearly allied to black; it is of the power of 11, and is composed of yellow 3 and blue 8. Its contrasting colour is yellow, and the tertiary citron, which is much used with it. Purple melodises red and blue, and is melodised by its tertiaries russet formed with orange, and olive with green. It is a cool colour, and it suffers much under artificial light, but next to green it may be used with the most freedom. With green or orange it may be used, with grey and with blue black is to be used. With white its combinations are very raw.

Indigo is the first hue, formed by blue on its union with red, and is a heavy colour little used, except in wove fabrics.

Purple forms various hues as lilac, &c., with which citron may be advantageously used.

Grey is a neutral colour, and enters with effect into many combinations, being the medium between light and shade. It is very useful in separating blue from green or olive. Its most happy combination is with red and orange, and with orange and violet, green and blue and green and violet.

To proceed to the tertiary colours.

Citron is a tertiary colour, in which yellow predominates; it is composed of orange 8 and green 11, being of the power of 19, or yellow 6, red 5, blue 8, its contrasting colour is purple and also slate; it melodises with orange and green, and is melodised by the next series, brown formed with russet and marrone with olive. Citron is greatly relieved and harmonised by olive. It is soft and pleasing to the eye and is the lightest of the tertiaries, much used as a contrast amongst low hues of crimson and purple.

In russet red predominates, being composed of orange 8 and purple 13, of the power of 21, or yellow 3, red 10, blue 8. Its contrasting colour is green and also marrone. It melodises with orange and purple and is melodised by the next series, brown formed with russet and slate with olive. This tertiary is of great use and particularly with green.

Olive has blue for its predominant constituent and is composed of green 11 and purple 13, being of the power of 24, or yellow 3, red 5, blue 16. Its contrasting colour is orange and also brown. It melodises with green and purple and is melodised by marrone formed with citron and slate formed with russet. Olive has a great relation to shade, and is characterised by Hay as soft and unassuming, being of great use in all arrangements, whether cool or warm, being employed with the lower hues of warm toned or brilliant composition. It must not be brought in contact with blue but separated by grey.

The next rank is held by the quaternaries or semineutral hues. These are:—

Brown composed of citron and russet, of the power of 40, consisting of yellow 9, red 15, blue 16. Its contrasting colour is olive. It is a most useful colour in the low parts of warm-toned arrangements.

Marrone is composed of citron and olive, being of the power of 43, or yellow 9, red 10, blue 24. Its contrasting colour is russet. This semineutral is most useful in wove fabrics. It is considered to be deep and clear, and although allied to red, may be used where there is a preponderance of cool-toned colours.

Slate is the deepest of the semineutrals, and is composed of russet and olive, being of the power of 45, or yellow 6, red 15, blue 24. Its contrasting colour is citron, and it can only be used in cool-toned arrangements.

THE NEW ROYAL OBSERVATORY, EDINBURGH.

ON Saturday afternoon the members of the Edinburgh Architectural Association paid a visit to the new Royal Observatory, which is nearing completion on Blackford Hill. The company met at the observatory at three o'clock, and there they were joined by Mr. W. W. Robertson, H.M. Board of Works, president of the Association and architect of the building, and Professor Ralph Copeland, the Astronomer Royal for Scotland.

The Astronomer Royal, in welcoming the members of the Association to Blackford Hill, said that although none of the larger instruments were yet in position they would at least see the arrangements that had been made for their reception, and for the pursuit of astronomical research. He trusted that the study of astronomy in these fine new buildings would flourish, and that the excellent work which was carried on by Professors Henderson and Smythe would continue.

Mr. Robertson then gave a short description of the main portions of the building. He said that in 1888 Lord Crawford of Balcarres offered to give his whole astronomical equipment at Dunecht, including the library, which contained over 15,000 volumes—the finest in Europe except, he believed, one in Russia—as a gift to the nation. This gift necessitated the erection of a new Observatory. The Government appointed a committee of experts to advise on the selection of a site and the arrangement of the buildings. After considerable deliberation the present site was selected and the Town Council granted them four acres of ground at a nominal price. The site chosen had the advantage of being free from the smoke and haze of the city, it had a perfectly free view of the horizon all round, with the exception of a small portion which lies towards the south obscured by the ridges of the Braids and Pentland Hills; and the horizon in the meridian was perfectly free. Professor Copeland had by means of minute experiments proved that the Observatory would be perfectly free from vibration.

The buildings included the Observatory proper, the Astronomer Royal's house, houses for the assistants, and a gate-lodge for the mechanic, as well as stabling accommodation. The T-shape of the buildings had been chosen in order to give the Observatory a clear outlook, so that the instruments could be placed in such a position as to sweep the whole horizon round. Then the transit house, which was one of the most important portions of the Observatory, was placed about 80 feet from the main building. The first reason for that was in order that they would keep the meridian line clear from the other buildings. A covered way connected it with the main building, because it was absolutely necessary to good observing that the observer should reach his work dry-shod. The walls of the transit house consisted of two thicknesses of metal with an inner and an outer covering of corrugated iron. The most complete arrangements were made to maintain an equal temperature, which was a very important consideration in such a place. Turning to the main building, Mr. Robertson said the largest of the two domes was intended for the large equatorial telescope from Dunecht, and the smaller dome would contain the smaller equatorial from Calton Hill. He pointed out that the disposition and character of the building was entirely governed by scientific and not architectural considerations. The main workrooms of the Observatory were in the principal front facing the north. After walking round the

building the company entered the transit house, where Professor Copeland said that the purpose of the department was simply for observing the time of day from the sun or from the heavenly bodies. The piers for the large instrument to be used in the room are of Dunecht granite, and weighed about 15 tons. The greatest care was taken to adjust the piers for the telescopes, and that was done by means of another instrument. The work of making the piers perfectly equal was performed with such exactitude that there was not a difference between them of a fraction of the thickness of a piece of tissue paper.

Passing along the covered way to the main building, the company visited in turn the photographic-room, in which there were three heavy piers to mount the instruments. Here also are the piers on which will stand the instruments and mean time clocks which will henceforth provide Edinburgh and Dundee with the time of day. The library, designed to contain 20,000 volumes, was inspected, and thereafter the party visited the optical-room, which can be rendered perfectly dark at a moment's notice. Here Professor Copeland said the room ran exactly north and south, and adjoining it to the north was a broad terrace right over the library, from which an observer can view the whole vault of the sky. In the northern end of the room he said there was a small window fitted to receive lenses of any size, and by means of these lenses and a powerful silverised mirror driven by clockwork outside on the terrace sunlight can be thrown into the dark room. Then in this room they could analyse the sunlight and photograph it, and they could also analyse the light of the moon or of the stars or the planets. The instruments would be mounted on carriages running on rails, which had an entirely separate existence from the floor to prevent false movements. On some of these carriages they could mount instruments of more than a ton in weight, and they could adjust these instruments to a very hairbreadth.

Arriving out on the terrace the party first visited the small or western dome, which, like its larger neighbour facing it in the east, is covered by an outer thickness of copper. The interior of the tower was reached by means of a narrow spiral stair. The equatorial telescope from the Calton Hill will be placed in the western dome, which revolves by means of ingenious mechanism, enabling the observers to sweep the whole range of the heavens through the opening provided in the side of the dome. The weight of a small iron brick is all that is necessary to start the revolving drum, which weighs nine tons, so exact is the mechanism. The other dome, which is of very much larger dimensions, revolves on the same principle. It will contain the large equatorial telescope, from the observations with which Professor Copeland anticipates many beneficial results. The drum of the large dome weighs 17 tons. Under it are stored 3,500 gallons of water for the use of the small colony of observers. Professor Copeland pointed out that the dome of 17 tons weight was easily and noiselessly made to revolve by means of a brick weighing 30 lbs.

In the large dome refreshments were provided, and thereafter Mr. Robertson proposed a vote of thanks to Professor Copeland. Mr. Ross seconded. Mr. Balfour Paul proposed a similar compliment to Mr. Robertson, and both were heartily awarded.

Professor Copeland afterwards took a number of gentlemen who, for the occasion, were unprovided with watches, to see his wonderful electro-magnet, which is fitted in a room in the basement. The magnet is the largest in the world, and Professor Copeland said that it exhibited not only the usual attraction on iron in its various forms, but also showed remarkable effects on copper and other metals usually classed as non-magnetic. Any person entering the magnet-room with a watch would regret it, as the magnet assuredly would effectively destroy it. There was no great danger in working the magnet at the start, but when once set agoing it could only be stopped with difficulty, culminating in a great flash, which did the damage. With this last sight of the wonders of the Observatory the visit ended, and the party returned to the city.

THE TEMPLE OF PHILÆ.

AT the last meeting of the Newcastle Society of Antiquaries Mr. R. C. Clephan read a paper on "The Temple of Philæ, and the danger of Submersion by a projected Dam, with Introductory Notes and History of the Temple, and Religious and Social Life of the Ancient Egyptians." The temple, he mentioned, was on a granite rock 1,000 yards in circumference, and situated a little above the first cataract of the Nile.

Mr. Holmes said this question of the Philæ temple was important at present. The engineers asserted that it was necessary, for the good of Egypt, to destroy the temple. The archaeologists said it must not be destroyed. As a compromise, it was proposed to inundate it. He supposed the temple would be left above high-water mark. It would therefore, at anything but high-water mark, be surrounded by a bank of slime, which would thicken until it became a sea of mud. The

value of swamping the temple was, however, in his opinion, more than the value of retaining it.

Mr. Clephan said he was very much afraid that the levels were not correct, and would carry the water up into the main temple. Lord Cromer had stated that the work was beginning now, and would be pushed forward over a good many years. He (Mr. Clephan) was quite sure that the expense would be so enormous that the advantage would be problematical.

Mr. Holmes remarked that there was this difficulty, that the site which would destroy the temple was about the only site affording an absolutely secure base for an embankment or dam. The French put up an erection which the English had to correct and make useful; but notwithstanding all their care the foundations were faulty. Anything founded in the Nile mud was almost sure to be undermined. The effect of this at that part of Upper Egypt would be to swamp the whole country, with the enormous accumulation of water they had there. Therefore it was absolutely necessary to have the dam on the rock site at the Temple of Philæ.

Mr. Clephan admitted that there was great weight in what Mr. Holmes had said, but the question was a very large one, and should not be hastily decided on.

LAKE DWELLINGS.

AT the last meeting of the Edinburgh Royal Society, Dr. Munro gave a sketch of "Lake Dwelling Research." He said that whatever may have been the primary object of lake dwellings, or the circumstances which led to their development, one thing was certain, that they had for many centuries been characteristic abodes of early inhabitants of Central Europe. He went on to describe the circumstances which led to the discovery of the sites of so many of those ancient dwellings, and to convey a general idea of the extreme wealth of archaeological material brought to light by subsequent investigation. The actual starting-point of research might be dated, he said, to the discovery of certain remains in a bog in Ireland upwards of half a century ago. Having explained the nature of the relics, he stated that an independent discovery was afterwards announced in Switzerland, which not only gave new significance to the Irish discovery, but opened up one of the most prolific fields of historic research that had ever come under the cognisance of archaeologists. He rapidly sketched the results of investigation made on the sites of the Swiss lake dwellings during the past thirty or forty years, afterwards treating of the concurrent researches instituted in other parts of Europe, special attention being directed to Italy. He stated that perhaps no locality in Europe contained a greater variety of the vestiges of past humanity than the valley of the Po. Having given interesting details of continental investigation, he said that the spirit of research stimulated archaeologists everywhere. Passing on to deal with such investigation in Scotland, he explained that the first great discovery was made in a loch in Wigtonshire. The loch was drained, and several artificial islands emerged, the antiquarian remains collected disclosing a picture of Scottish civilisation previously unknown to historians or archaeologists. Among the remains were canoes, bronze dishes of Roman origin, bracelets and other ornaments. After referring to subsequent finds in Scotland, he spoke of the recent discoveries of lake dwellings in Bosnia. In concluding, he said that the coincidence in the style of art in the ornaments recently found at Glastonbury with those obtained in Northern Germany was of peculiar significance to ethnologists and archaeologists.

FLORENTINE ART.

A LECTURE on "The Romance of Florentine Art" was delivered lately by Mr. Arthur Lee in the Bristol Museum. He said that in the Florence of Dante, Petrarch and Boccaccio they felt almost at home. With the men and women of that time they could feel much in common, as their manner of life and their ways of thinking were not so widely different from our own. After describing the beauty of the city and the building of the earlier bridges which span the Arno, the speaker proceeded to give a description of the great cathedral and its builders. The history of the building was traced, including the International Conference of Architects which took place when the plan of the dome was debated. After a short historical account of the baptistery of St. John, with a description of the great bronze gates and the "Jericho" panel, Mr. Lee stated that the Palazzo Vecchio was built by the Florentines for the Priors to live therein during their term of office. This was when the Florentines were making a most important political experiment. A little more than 600 years ago they resolved to do away for ever with the power of their nobles. They abolished their "House of Lords" root and branch. Twelve citizens called Priors were elected by popular vote. To them was entrusted the whole conduct of affairs. Never again,

resolved the Florentines, under any circumstances would they allow a ruling class to be evolved, so it was seriously resolved that a general election should take place once in two months. The Priors retiring from office could not be re-elected. The hereditary principle was recognised, but only in the way of creating disabilities. A son could not be elected under two years after his father had served. It was enacted that every man must be a tradesman, or at least a member of some trade guild, otherwise he must submit to be called a Scioperato or "Do Nothing," and as such he was excluded from all participation in the government. Florentines did not quite rise to the payment of members—he meant "Priors"—but they lodged them and fed them at the public cost, which was perhaps next door to the modern proposition. The power of the Priors was limited. They could administer but could not legislate. In grave matters it was their duty to call all the people into council. But all this jealous care was of no avail, and the most democratic Government which the world has ever seen fell by its own defects. There were violent and sudden changes of public opinion, and the career of the Medici family was one of the most remarkable instances where the popular voice alternately raised them to the highest power and then made them outcasts. Cosmo de Medici filled in turn every important office in the gift of the people, but in 1433 his enemies secured the popular support and drove him from the city. Within a year of his banishment he was called back again by another popular vote to put an end to this experiment, amid popular acclamation, and he governed the city until the time of his death as an absolute ruler. After describing the casting of the *Perseus* by Benvenuto Cellini, the Florentine Public Library, the University and the habits of the students, Mr. Lee touched on the building of the Pitti Palace and the fall of Luca Pitti, who swiftly fell from popular favour into dire disgrace. The failings of the Florentines were forgotten, as they honoured the evidence of their genius, and the Florence of the Middle Ages was borne in men's minds to-day not so much by reason of the work of her warriors and statesmen as by that art which was the deathless creation of her painters, her sculptors and her poets. The lecture was illustrated with a number of dissolving views.

THE LATE SIR H. RAWLINSON.

ON Tuesday Sir Henry Rawlinson, who had so often escaped imminent death in the East, succumbed to one of those chills to which warriors and statesmen are as liable as ordinary men. To speak of Sir Henry Rawlinson as a man of science in any adequate fashion, says the *Times*, would fill a volume. As is well known, Sir Henry, when he first went to Persia in 1833, spent much of his time in tours through some of the remoter districts of the country. In 1837 he wrote an account of a tour through Susiana and Elimalis. This he supplemented with a description of Ecbatana, which gained for him the gold medal of the Royal Geographical Society. He began as far back as 1835 to copy down the cuneiform inscriptions on the rock tablets at Behistun. He had achieved no inconsiderable results, and was on the threshold of complete success when the Afghan war summoned him elsewhere. On his appointment to Bagdad he renewed his connection with Mesopotamia, and found that the excavations at Khorsabad, conducted by M. Botta, the French Consul at Mosul, had facilitated his task. The archaeological remains found there in abundance showed that all the Assyrian legends were described in ancient Persian translations. By mastering the old Persian character on the tablets at Behistun he found the key which eventually deciphered all the memorials of Assyrian history. The years 1844 and 1845 were specially devoted to this task, and in 1846 he published his first work on the cuneiform inscriptions. In 1847 he obtained by incredible personal exertion and not without risk, as the most important inscriptions were on a precipitous rock 300 feet above the plain, complete copies of all the inscriptions. In 1849 he paid a visit to England after an absence of twenty-two years, bringing with him the copies mentioned. A very short time after his return to England he read the celebrated paper on the cuneiform inscriptions of Assyria and Babylonia, in which he gave the first translation of the "Black Obelisk Inscription." This paper was followed up by his discovery among the inscriptions just brought home by Mr. Layard of a mention of the war between Hezekiah and Sennacherib. In 1851 Sir Henry Rawlinson was granted the sum of 3,000*l.* by the British Museum for the purpose of systematic excavations, in which he employed Mr. Hormuzd Rassam and several others. These excavations were carried on with equal ability and caution. Many of the sculptures are to be found in the British Museum, and, although no regular history exists of these efforts and their results, there is much to be learnt on the subject from contributions by Sir Henry Rawlinson and others to the Asiatic Society's journal between the years 1852 and 1856. In

Germany Sir Henry Rawlinson's claims to be regarded as the first decipherer of the cuneiform have always been allowed without hesitation, notwithstanding the labours of Lassen and others in the same field, and among the earliest and most cherished of Sir Henry Rawlinson's foreign orders was the Prussian Order of Merit.

TESSERÆ.

Pneumatics and Foundations.

IT is said that Papin, the eminent physicist, born at Blois in 1647, conceived the idea of employing a continued supply of compressed air to enable workmen to build under a large diving-bell. In 1779 Coulomb presented to the Paris Academy of Science a paper detailing a plan for executing all sorts of operations under water by the use of compressed air. His proposed apparatus was somewhat like that now in general use. In 1831 Earl Dundonald, then Lord Cochrane, took out a patent for a device for sinking tubular shafts through earth and water by means of compressed air. His air-lock was much like modern ones, and was to be placed at the top of the main shaft. His invention was made with a view to its use in tunnelling under the Thames and in similar enterprises. In 1841 Bush also took out an English patent for a plan of sinking foundations by the aid of compressed air. A German, by name G. Pfaun Muller, made a somewhat similar design for a bridge at Mayence in 1850; but as his plan was not executed, it was, like the patents of Cochrane and Bush, little known till legal controversies in regard to patent rights dragged them from obscurity. The first practical application of the plenum process was made in France in 1841 by M. Triger. In order to reach a vein of coal on a sandy island in the Loire, opposite to Chalons, he sunk an iron tube about 40 inches in diameter some 60 feet by the blows of heavy weights. The fine sand was removed from the interior by means of a scoop-bucket. On reaching a layer of coarse gravel, he could not force the tube through. He therefore capped his tube with an air-lock, and by compressed air forced out the water which had all the while filled the tube, and sent workmen to the bottom. The pressure he used was never greater than two atmospheres. The water was discharged through a small tube, into which, several feet from the bottom, a jet of air was allowed to enter, thus diminishing the specific gravity of the column till it was rapidly blown out. In 1845 Triger read a paper on the sinking of a tube about 6 feet in diameter to a depth of 82 feet by the same method, and suggested the use of it for the construction of deep foundations for bridges. Dr. Potts generally has the credit of inventing the vacuum process, for which he took out a patent in 1848. Many times in sinking foundations by this method the compressed air process was resorted to so that men could enter the pile to remove obstructions, and finally its many advantages caused it to entirely supersede the vacuum process. At present the term "pneumatic process" is practically synonymous with compressed air process. The first foundations sunk entirely by the latter were the pneumatic piles for the bridge over the Medway at Rochester, put down in 1851. The depth reached was 61 feet. The first pneumatic caisson was employed at Kehl, near the eastern border of France, for the foundation of a railway bridge across the Rhine.

Floor Coverings.

In English houses in Elizabeth's days even the floors of banqueting halls and ball-rooms were covered with rushes, for Shakespeare says, that "Wantons light of heart tickle the senseless rushes with their heels." If the owner could boast of a carpet, it was reserved for the chamber or the parlour. Rushes not only allayed the dust, but served as a token of respect. "Are the rushes strewed?" asks Grumio, when expecting the arrival of Petruchio and his bride. On the floor were spread new rushes when guests were invited. It was an old joke among the wits of the Elizabethan age that many strewed green rushes for strangers who would not give a straw for a friend. To cover the floor, indeed, was deemed so necessary a point of courtesy that when not performed it was said that the host did not care a rush or a straw for his guest, hence the origin of an expression common now. The use of these homely materials pervaded all classes; even the hall of the virgin queen, according to Hentzner, was strewed with straw. Among the middle class this custom prevailed at a much later period, and the welcome associated by time-honoured usage with the strewing of rushes retarded the general introduction of carpets. Many retained the use of the homely herbage, whose wealth placed the looms of Italy at their disposal. Carpets, however, which during the Middle Ages were rarely found except in the homes of royalty, were gradually becoming less expensive. Beaumont and Fletcher's coxcomb does not forget among the luxuries with which he would have his house arranged, to specify the "Turkey carpets," the use of which was so opposed to the habits of the people that they were as

yet regarded as luxurious and foppish. Carpets of "Torquey makyng" and carpets of silk, covered, many of them, with beads and gems, were among the household treasures of Henry VIII. His Highness, just before his death, purchased of Lawrence Warren, merchant, "a very faire carpet." It was the most sumptuous "tapet" in the Royal household, being embroidered with venie gold and trails of pearls on a ground-work of crimson satin; it was edged with a deep border of gold and rows of pearls, and lined with green silk. Many of these beautiful carpets were the productions of English embroiderers.

Spanish Architecture in the Thirteenth Century.

As soon as the thirteenth century is reached we find a new native Arab style in the Peninsula, Moslem, no doubt, and entirely unlike the contemporary Christian architecture of Spain, yet distinctly and distinctively Spanish. And it is this style which in the hands of the descendants of those Syrian conquerors who founded a second Damascus at Granada reached its highest perfection on the ever-celebrated banks of the Darro. It was not until the Moslem art had well nigh forgotten the traditions of Byzantium and revelled in its own originality that it reached the highest pitch of perfection in the Peninsula. And if Granada did not enjoy the artistic supremacy in contemporary Europe that was universally allowed to Cordova, it was not so much that the Spanish Moslem was less powerful and his culture less directly influential, as that Europe had in two centuries become at once relatively and absolutely more civilised than before. The Christian Renaissance was at hand. Yet Granada was a centre of artistic culture, less magnificent and less powerful but no less truly artistic, and actually distinguished by a more characteristic originality and spontaneity of development than the Cordova of the greater Caliphs. Among all the buildings, not only of Spain but of Europe, the Alhambra at Granada has long been accounted one of the greatest marvels and exemplars of superlatively graceful construction that still lives to disarm the critic and to delight the lover of the beautiful.

The Exhibition of 1760.

The year 1760 was rendered memorable in the annals of British art by the opening of the first public exhibition of the works of modern painters, sculptors and architects. The result of this scheme exceeded the most sanguine expectations of the projectors. All ranks of people, says a contemporary writer, crowded to see the delightful novelty. It was the universal topic of conversation, and a passion for the fine arts was excited by this first manifestation of native talent, which has ever since been increasing in strength, and extending its effects throughout the length and breadth of the land. The history of English exhibitions affords of itself the strongest evidence of their effect upon the public taste. Although at their commencement some men of enlightened minds could distinguish and appreciate what was excellent, the admiration of the many was confined to the most puerile subjects and the meanest efforts of imitation. But these puerilities have long since ceased to produce astonishment and delight, even in the vulgar, and we see with surprise such trifling subjects as the following in the catalogues of the early exhibitions:—"A Corner Cupboard," "A Gazette in a Frame," "A Bunch of Flowers in Tent Stitch," "A Coach Panel," "A Cucumber," "A Lady in a Snuff-box." To this exhibition, which opened on May 21, in the great room of the Society for the Encouragement of Arts, Manufactures and Commerce, Reynolds sent four portraits of the Duchess of Hamilton, Lady Elizabeth Keppel, a Gentleman, and Lord Charles Vernon.

Decorated Belfry Openings.

The belfry windows and other windows in towers have usually a distinct character, and are frequently partially filled up with stonework, as at Aynho, Northamptonshire. Sometimes they may be called twin-windows, consisting of two single lights coupled together with a niche for an image between them, as at Irthlingborough and at Bloxham, Oxfordshire. The openings filled with tracery, but not glazed, which are found in some districts, especially in Norfolk (and there commonly called soundholes), sometimes occur in this style, as at Great Addington, though they are more common in Perpendicular work. The name of soundholes is not very applicable, as they are more strictly airholes; they are not used in the bell-chamber, but in the ringing-loft, to give air to the ringers. Those belonging to this style are generally smaller than in the next. They are sometimes diamond-shaped, but more frequently square. Triangular windows are likewise frequently used in the points of gables over large windows. Sometimes the common straight-sided triangle, more often the spherical triangle, as at Alderbury, Shropshire, and the Maison Dieu, at Dover. In the later examples these openings are filled with bar-tracery, the same as in the windows of other forms and sizes.

NOTES AND COMMENTS.

A CORRESPONDENT asks our opinion on the following point:—"I have just built a large hotel for a company, under ordinary contract stipulations, on a very exposed position. A storm of unprecedented violence struck the building (just before last Christmas) when I had the work nearly complete, doing great damage to the roof and window-glass. This storm completely unroofed other houses in the same town, and wrecked one new house completely. The architect attached no blame to me. The company had actually paid 80 per cent. of the money on account when this damage was done. The question now arises whether the company or I am to be liable for the cost of repairing the damage to slated roof and window-glass?" It is a principle of law that a contractor should carry out whatever he agreed to do, and as the hotel was, we suppose, to be delivered up in a complete condition as approved by the architect, our correspondent will, we are afraid, find it difficult to persuade the company to assume responsibility for the damage before they have possession. A hundred years ago a contractor who had undertaken to repair a bridge which during the operations was overthrown by an extraordinary flood, was compelled to rebuild the bridge. That precedent is still binding. The words of Mr. Justice (afterwards Lord) BLACKBURN are important:—"Where there is a positive contract to do a thing, not in itself unlawful, the contractor must perform it or pay damages for not doing it, although in consequence of unforeseen accidents the performance of his contract has become unexpectedly burdensome or even impossible." It might be pleaded that the maxim "*Actus Dei nemini facit injuriam*" applies to the case. That is interpreted by BROOM as meaning, "It would be unreasonable that those things which are inevitable by the act of God, which no industry can avoid, no policy prevent, should be construed to the prejudice of any person on whom there has been no laches." Storms as well as tempests and lightning come under that designation, which means, as Baron MARTIN said, "something overwhelming, and not merely an accidental circumstance." "Unprecedented violence" would not be readily admitted by any judge. Whether the storm which operated on the hotel would come under that term would depend on local evidence. In any case, it was one of those visitations which a man is bound to endure and cannot cast on other men. Meanwhile it will be well to remember that risks of damages for non-completion of the hotel are likely to be incurred while the subject is being debated.

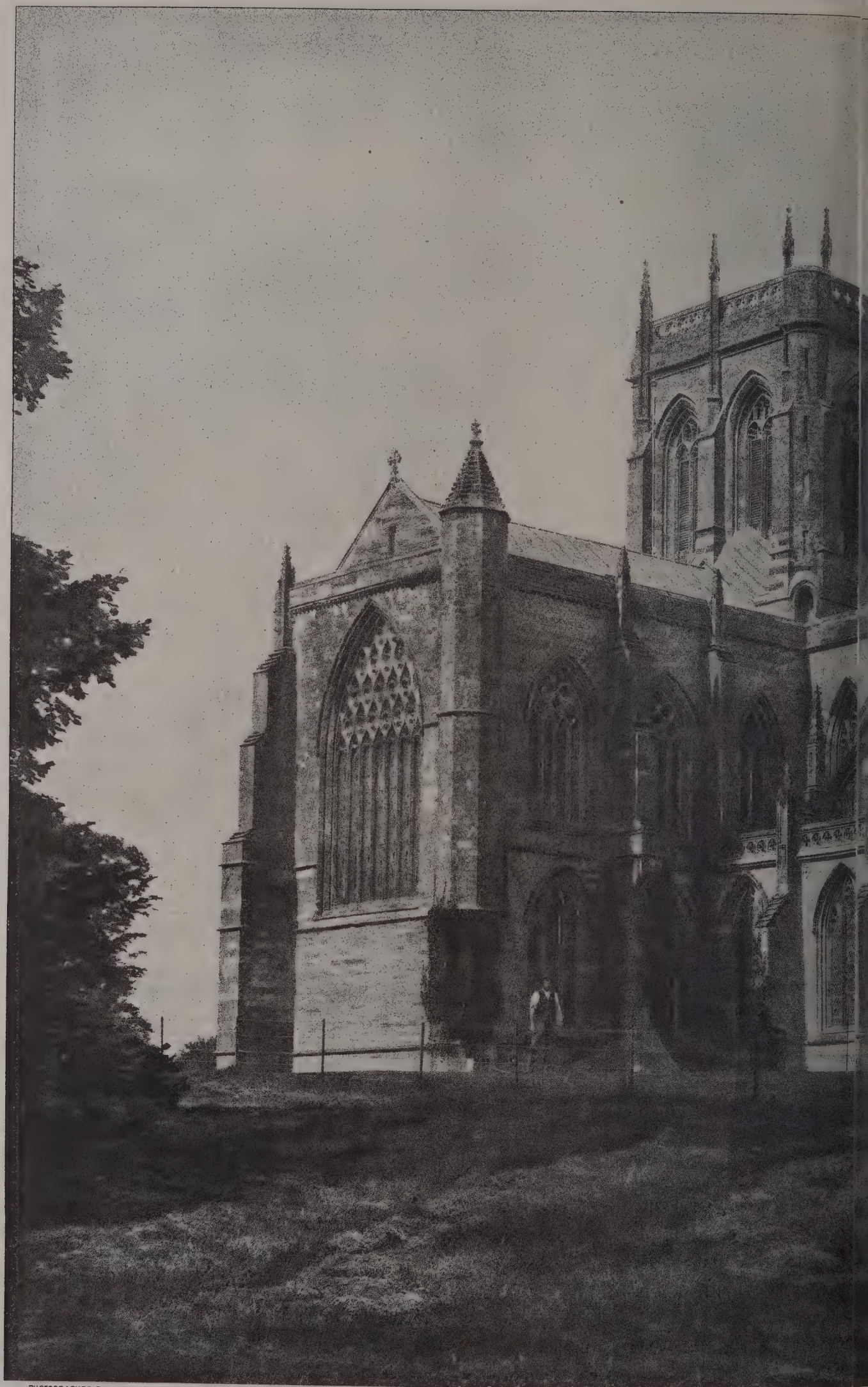
For a long time the architects of the United States have been dissatisfied with the system adopted by the Government for designing and carrying out public buildings. In the department of architecture there are about one hundred employes. There is a legal division in which all business relating to sites, contract deeds, &c., is transacted. The technical division has to deal with designing, specifications, quantities and other calculations, and the superintendence of works. When it is remembered that the buildings are scattered throughout the United States, and range in value from 2,000 dols. to 4,000,000 dols., it is evident that to carry out the work efficiently is no easy task. The accountants' division has a corresponding responsibility. From time to time architects have assumed the office of supervising architect with a light heart, but only a short time is required for the strongest man who holds the office to be overwhelmed by his duties. If he is zealous, he gives dissatisfaction within as well as without his department, and he must not expect either loyalty or gratitude. Mr. CARLISLE, the Secretary of the Treasury, appears to be as eager about reforming the architectural department as a minister can be who must remember that if he meddles with abuses he turns voters against him. Accordingly he offered the post of supervising architect to Mr. CARRÈRE, who might be described as the representative of the architects in attacks on the department. Mr. CARRÈRE, however, considered the subject as became a loyal citizen, and endeavoured to take a favourable view of the opportunities for good which were before him. But he was

compelled to decline the offer. He realised that with all the responsibilities devolving on him he would be only in the position of a Treasury clerk, and the extent of his authority would depend on the whim of the Secretary. But even if those conditions could be satisfactorily arranged, Mr. CARRÈRE says that no man could combine the designing and superintendence, and the only feasible course will be to divide the work and entrust it to the best architects in the country, leaving the administrative portion only in the hands of the Government.

It is not always an advantage for an artist to have the name allotted to him which was borne by a greater artist. MALLARD TURNER, for example, has eclipsed WILLIAM TURNER. Yet the latter, who is further distinguished as "TURNER of Oxford," instead of having only a local reputation, would have been revered as one of the patriarchs of water-colour art if a namesake were not born fourteen years earlier in Maiden Lane, where the garbage of Covent Garden could develop his sense of colour. WILLIAM TURNER was born in 1789, in Blackbourton, Oxfordshire, and he was apprenticed to JOHN VARLEY. He exhibited as early as 1808 at the Water-Colour Society, and in the following year he was elected a member. But he cared little for fame if it had to be purchased by residence in London. WILLIAM TURNER returned to Oxford, and there he resided until his death in 1862. Views in the University town and in the country around formed his most characteristic works. Mr. RUSKIN reckoned him among his few favourites, for speaking of one of the old exhibitions in Pall Mall he said:—"Except the works of HUNT, PROUT, COX, FIELDING and FINCH, there are generally none in the room which deserve so honourable a place as those of WILLIAM TURNER." Through the enterprise of the President of Trinity College and Mr. T. W. JACKSON, of Worcester College, a loan exhibition of the artist's drawings is now open in the University Galleries, Oxford. It is a deserved tribute to the memory of a man who, under happier conditions, would have founded an Oxford school of painting.

AMONG the sights which every visitor to Scotland is expected to see, the two waterfalls of Foyers, and especially the lower one, hold a prominent place. They rarely disappoint anticipation, and all that was written about them in verse and prose appears to be without exaggeration. It is no wonder the proposal to utilise them for some new aluminium industry excites alarm among lovers of the picturesque. The promoters declare that the buildings which are to be erected will not diminish the beauty of the landscape, but as much has been said of every hideous railway station, viaduct or chimney which engineers have erected amidst the fairest spots in Britain. There is, however, no law to preserve landscapes from assaults or to secure the loveliness of nature. The local authorities have had to approve of the plans of the proposed works, although not without grumbling. Whether the Secretary of State for Scotland will be able to interfere before building operations are started remains to be seen, but as employment will be offered to a large number of men the Government are likely to hesitate in setting up an obstacle to a new industry.

THE second issue of the "Engineer's Year Book" has been published by Messrs. CROSBY LOCKWOOD & SON. It contains additional matter, and several of the articles, including "Girders and Bridges," have been rewritten. There is an astonishing amount of information in the pages, and of the kind which can be turned to account in everyday practice. We cannot mention the name of the publishers without expressing regret for the death of the head of the firm. Mr. CROSBY LOCKWOOD rendered many services to architecture and construction in general, not only by the publication of numerous excellent works, but also by his efforts to make technical literature available to students who were not wealthy. His name deserves to be recorded among the foremost diffusers of knowledge of the century.



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8th 1895.



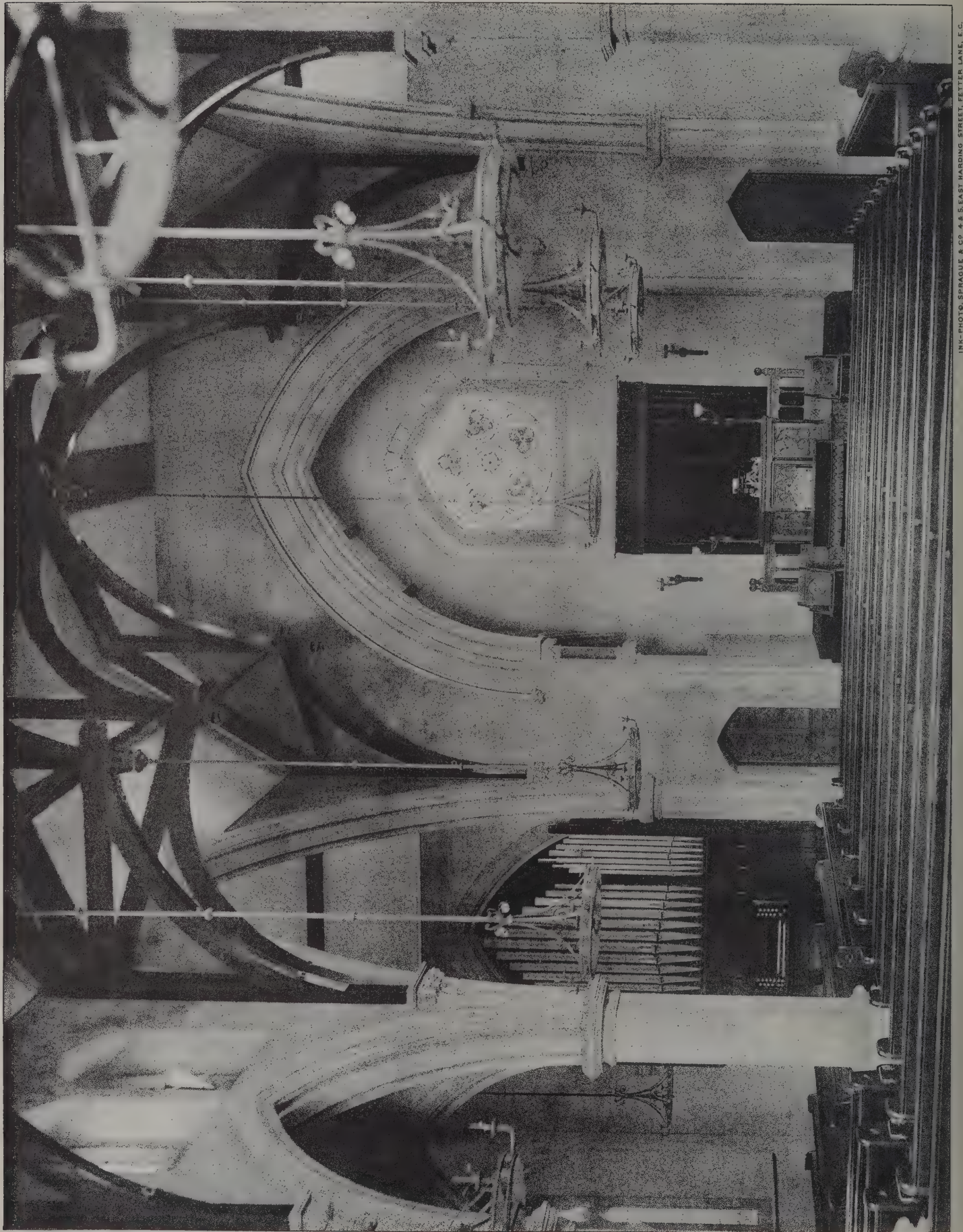
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EAR BLANDFORD.



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CONGREGATIONAL CHURCH, HAYDOCK, LANCASHIRE.



HOLT CONGREGATIONAL CHURCH, RAINHILL, LANCASHIRE.

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HOLT CONGREGATIONAL CHURCH, RAINHILL, LANCASHIRE.
THOMAS W. CUBBON, Architect.



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ELEMENTARY SCHOOLS, ASHTON-IN-MAKERFIELD, LANCASHIRE.
THOMAS W. CUBBON, Architect.

ILLUSTRATIONS.

MEMORIAL BUILDINGS, RAINHILL, HAYDOCK AND ASHTON-IN-MAKERFIELD, LANCASHIRE.

THESE buildings, views of which we publish to-day, have been erected at the sole cost of Miss RUTH EVANS, of Briars Hey, Rainhill, in memory of her brother, the late JOSEPH EVANS, colliery proprietor, of Haydock. The total cost of the combined schemes has been nearly 25,000*l.*, exclusive of land and furnishing.

The whole of the buildings have been carried out from the designs and under the superintendence of Mr. THOMAS W. CUBBON, architect, of Birkenhead, the contractors in each case being Messrs. HUGHES & STIRLING, of Liverpool, Mr. CLYDESDALE acting as clerk of works at Rainhill and Mr. HALSALL at Haydock.

Holt Buildings.

The Holt buildings consist of the following sections:—Congregational church providing seating accommodation on the ground-floor for about 650, having organ chamber, vestry and cloakroom accommodation at the rear. The style of the design is late Gothic in character, the plan of the church being cruciform, having chancel and transepts. The clerestory is carried upon handsomely-moulded arches, supported upon massive octagon pillars, having richly moulded caps and bases all of white Cefn stone, as are also chancel, transept and organ-chamber arches. One main front entrance and two side entrances are provided in addition to rear entrances. The buildings are faced externally with local red sandstone, and all the internal woodwork is of pitch-pine toned and varnished. The rostrum, which is of handsome design, is constructed of selected pitch-pine, the angle shafts being ebonised and other features richly moulded and carved. The traceried windows are filled in with enriched lead-lights of beautiful design. The gas-fittings, encaustic tiling, vestibule screens and decorative work have all been designed in harmony with the main structure. A handsome tower and spire occupies the south-west angle of main building, and rising as it does to an altitude of over 120 feet is seen for many miles on all sides.

Sunday school buildings, consisting of large assembly-hall capable of accommodating over 300 children and having in conjunction therewith four classrooms each for about eighteen scholars. These buildings, which are prominently situated at the right of church, are designed in harmony therewith, and have an octagon bell turret at the right of main gable, which is corbelled out and carried upon red granite shafts. The internal work is of similar material and character as the church, but somewhat less ornate.

Swimming and plunge bath, 50 feet in length and 23 feet wide, having the sides lined with white enamelled bricks, and the bottom laid with heavy white tiles on a concrete bed. Around the bath are fitted suitable dressing-boxes, and all modern conveniences are provided. The bath is lighted by a lantern roof, having movable louvred ventilator therein.

Gymnasium, clubhouse, cocoa-rooms, including large room 51 feet by 21 feet, having dressing-room and other conveniences attached. Two large reading-rooms on the first floor. Cocoa-rooms, consisting of large and beautifully fitted refreshment-room, having handsome serving bar, specially designed seats and tables. This section also includes commodious residence for manager, accommodation for bicyclists, &c.

Haydock Buildings.

These buildings consist of church to accommodate 650, similar in arrangement to the Rainhill Church, but are externally faced with red Ruabon brick, relieved by dressings of Runcorn red sandstone.

The school buildings consist of assembly hall for 300, having four classrooms and infants' room.

A handsome memorial drinking fountain has been erected in connection with these buildings by the residents in the neighbourhood.

The cost of these buildings was about 9,000*l.*

Ashton School Buildings.

These buildings have been erected for elementary education purposes, there being accommodation provided for about 850 children, and are two storeys in height.

On the ground floor there are infants' general school-room, juniors' classroom, babies' classroom, cookery classroom with scullery attached, joinery class with demonstration-room adjoining, boys' lavatory, infants' lavatory, two teachers'-rooms, caretaker's store, stationery store and marching corridor.

On the first floor are general mixed schoolroom, six large classrooms, girls' lavatory, head-master's room, stationery store and marching corridor.

A commodious covered playground is provided in the basement.

These buildings are faced with red Ruabon bricks having red sandstone dressings. The cost was about 5,200*l.*

The principal sub-contractors employed upon the works were as follows:—Engineering to swimming-bath and heating, Messrs. BRADFORD, of Salford; lead-lights and gas-fittings, Messrs. GREATRIX, of Manchester; plumbing, painting and glazing, Mr. R. ROBINSON, of Birkenhead; wrought-iron art work, Messrs. HARDMAN & POWELL, of Birmingham; gates and railings, &c., Messrs. MACFARLANE, of Glasgow; slating and plastering, Mr. MOORE, of Manchester.

MILTON ABBEY CHURCH, NEAR BLANDFORD.

THE ARCHITECTURAL ASSOCIATION.

AT the meeting of the Association on Friday evening last, Mr. Beresford Pite, vice-president, took the chair.

A vote of thanks was passed to Mr. E. A. Rüntz for inviting the members to inspect the new Pavilion Music Hall at Whitechapel.

Messrs. P. W. Meredith and J. W. Abraham were then elected members.

The Use of Sculptural Decoration at the Present Time.

Mr. STIRLING LEE opened the proceedings on the above subject by some remarks which chiefly referred to the sculptured panels which he had carried out on the exterior of St. George's Hall, Liverpool, which we have often before described.

Mr. F. T. W. GOLDSMITH, senior hon. sec, then read a communication from Mr. W. Young on the subject, in the course of which the writer said:—The subject of the use of sculpture in architecture is a most interesting one and one which I have done my best to promote, not only in talking and writing, but in actual work—because I believe in it. Sculpture in building has, in my opinion, been too much neglected, and ornament has been overdone. One would rather see in a building a small amount of really good sculpture than a large amount of ornamental work. At the same time one must not forget that sculpture on any great scale can only be done on public or monumental buildings; in domestic work it is not likely to hold a large place. I think it is the office of the architect to produce sculpture in place of ornament whenever he has the opportunity, or rather he should try and make the opportunity. The question of cost is undoubtedly a difficult one to overcome, but I think if we, when the opportunity of using sculpture occurs, put clearly and forcibly before our clients the difference in result and value between sculpture and ornament, this difficulty may be overcome; at least, such has been my experience. But, granted the opportunity to employ sculpture, which is the grandest decorative aid to architectural design, we must take care that it is not merely figure-carving in stone but sculpture of the highest class which we must aim at. In my opinion, sculpture in architectural work brings out the highest qualities of the artist. There he deals with its conception, with its composition, with its proportions, without going into the elaboration of too much detail. For sculpture in architecture should, first of all, be broad and very simple. It is also necessary that it should be to a scale, both in size and relief, proportionate to the place in the building which it occupies. One has seen in many of the recent efforts to adopt sculpture in buildings, figures of such a small size and so out of proportion to surrounding work that they look like toy figures only fit for the Lowther Arcade, and forming no part of the architectural scheme. Not only should the scale be proportionate to the building, but it should not be any random figure stuck in in any place, but the whole should be part of a scheme both in subject, in size, in treatment and in relief, so as to form a harmonious part of the building which the sculpture decorates. I am afraid that in the present day, with a growing tendency to produce sculpture in buildings, we shall get, as we have in other things, a cheap and shoddy sculpture. If we employ sculpture at all we should take care that it is of the very best. It should be sculptor's sculpture, and not stone-mason's sculpture. I had an example of this a little time ago, when a man was introduced to me who offered to execute a

7-foot statue in stone for one of my buildings for something like 30*l*. I happened to have seen some of the man's work, and in reply, while thanking him for his kind offer, I remarked to my friend standing beside me, who said, "Very reasonable price," "Yes, but I would rather pay 50*l*. not to have his sculpture in my building than pay 30*l*. and have it." My advice to you is, avoid this kind of sculpture, as well as all pretence at sham art. If you cannot get the real article do without it.

Mr. F. W. POMEROY next read a paper on "Plaster Work." After a few preliminary remarks, Mr. Pomeroy said:—The material known as plaster-of-Paris is the basis of nearly all work I shall consider this evening, and is used by sculptors and others for taking casts, &c. It was well known to the ancients, who obtained from Syria, and probably other countries, a stone called by Theophrastus "gypsos," which resembled alabaster, and was converted into plaster by burning in a suitable furnace, grinding and sifting. If one part of plaster is mixed with about 2½ parts water, after a time it sets into a hard and enduring mass. It was employed in the same way and for similar purposes as at the present day. One of the most important deposits is that of Montmartre, Paris, but it is also found abundantly in Derbyshire in this country, and many other parts of Europe and America. The purer semi-transparent specimen of gypsum or alabaster is used for ornamental work, such as fine masonry and statuary, and is a very durable and beautiful material for interior work. By adding a little lime to plaster-of-Paris, it causes it to set slower but increases its hardness. Substances other than lime are also employed for the purpose of rendering the mass hard; thus Parian cement consists of fine plaster mixed with alum and borax, and re-burning.

A cement used by marble masons is made of the same plaster mixed with a small quantity of alum and soda. For building work, a first coat is generally laid on of lime thoroughly slacked (so as to be free from all tendency to contract moisture) and mixed with sand and cow hair.

The face of this coat (which should be of considerable thickness) is trowelled or indented with cross lines to form a key for the finished coverings. The second coat is applied when the first is thoroughly dry. (This is a necessary precaution, or the damp will work through and destroy or discolour any decoration that may be applied.) It is then rubbed with a flat board or float, so as to fill the indentations and cover the surface equally. The ornamental or finer plaster-of-Paris is then applied before the second coat is quite dry.

Many architects desire that their ornament should be modelled *in situ*, and I am fully aware of the importance of this; but have always found that it is quite impossible under the present conditions of building to carry out entirely a design of an elaborate nature, such as figure-work or intricate foliage; a simple design is possible only, and the plan generally adopted is to model in clay or wax a piece sufficiently large to form an idea of the scale and projection of the modelling, and fix it up in something like the position it will eventually occupy. As a ceiling is generally lighted from windows that come underneath, a good way of testing the effect is to lay the model flat on the floor and hold a good-sized looking-glass as high as necessary above it; by this means one can get a good general idea of the effect of the whole.

But reflected lights and other reasons demand that the work should always be considered in a liquid state, *i.e.* to be worked on and completed after it is fixed. This may be said to apply to all architectural decoration.

Where the windows run up close to the ceiling I have found flat or low relief most agreeable, and very high relief is never desirable; it harbours dirt and dust and throws shadows, which become very troublesome to the people who have to live in the rooms.

The charm of much of the old ceiling-work, I venture to think, is enhanced by the many coats of paint or whitewash they have received, which has stopped up the small cracks in the work and accidentally given breadth to the whole, and much modern work would be improved by the same treatment.

I have tried in ceiling-work that I have been engaged on lately to avoid sharp undercutting, and where undercutting is necessary to give accent to the design, it should be done with a rounded instead of a sharp edge, and a much softer shadow is thus obtained. But as each fresh work is a new problem, so the modeller, to have the true decorative spirit, must constantly bear in mind the general scheme of the mouldings that surround his work and govern the scale, and perhaps the most noticeable feature in modern surface decoration is overcrowding, and one of the greatest difficulties of the designer is to know how much to leave out rather than what to put in. Indeed, the designer who understands this quality has got well through his troubles, and the value of an occasional plain space cannot be over-estimated.

Of course, the well-trained figure sculptor understands the value of tone, light and shade, and envelopment, but unfortunately the common or everyday carver has little or no time

allowed to consider such abstruse problems, consequently his only idea is to make the particular piece of work that he is engaged on "sing out," without any regard to the *ensemble*.

For repeating ornamental plaster models, gelatine, wax and piece moulding in plaster are the methods usually employed. Gelatine is the simplest and best when only a few casts are required, as it can be done without any complications in the case of undercutting. I have here a small example of the gelatine mould process of casting (which may interest some of you after I have finished this paper). Wax moulds are generally used for the so-called fibrous or canvas casts of commerce, as the canvas in the plaster holds the moisture too long and destroys the face of the gelatine.

Piece moulding is a more complicated way of obtaining reproductions, and is used by moulders who may desire to preserve their moulds for future occasion. The object to be cast is covered by a number of small pieces of plaster, the edges of which are trimmed with a knife, so that they will each draw freely, and moistened with a little sweet oil and soap mixed, to prevent sticking together; when the object is completely enveloped by a number of pieces, it is necessary to hold them together by means of a case, also made of plaster. The liquid mass is then poured in slowly, and the mould turned, so that it may be covered equally. When set the outer case is removed, and then each piece carefully drawn away from the reproduction and replaced in the case. The thin seams which one sees on the plaster-casts are caused by these joints in the piece mould. For work executed *in situ* a mixture of Parian cement, well burnt slacked lime, putty and silver sand, the proportions varying for different kinds of work, but generally about two parts Parian cement to one of sand and one lime, but this is more properly stucco-duro, and a ground of Portland cement and common hair mortar is used, the Portland cement stopping the suction and allowing the applied stucco to set more slowly.

Stucco-duro, as practised by the Italians, is a very ancient method, and is mentioned by Vitruvius. It was almost lost, but was revived again in Italy in the sixteenth century.

Raphael and Giovanni da Udine were then so interested by the discoveries during the exhumation of the Baths of Titus, under Leo X., that they at once made experiments in this material, and the Loggia of the Vatican was one of the first results. It was composed of plaster-of-Paris, silver sand and marble dust, and was capable of taking a high polish. In Kensington Museum there is a beautiful model of the central hall of the Villa Madama in Rome, which was decorated by Giulio Romano and Giovanni da Udine. The model also exemplifies the possibilities of this composition, for its maker, Professor Mariani, of Perugia, has employed stucco-duro for the modelling of the ornament, which shows it can be used for the finest work; indeed, it is used by modellers for goldsmith's work as less liable to injury than wax. If used too quickly and heavily it will crack, but it must be modelled rapidly and surely, and only those of great dexterity need attempt it.

A stucco composed of plaster and glue-water is used by modern sculptors, and is preferred to clay for very large work. Mr. Watts modelled his great statue of Hugh Lupus for Eaton Hall in it, and the groups in front of the Trocadéro in Paris by Falguière were modelled in the same material.

You first make a sketch model in clay or wax to scale, taking great care to have your proportions exact; then the large framework is made of iron supports and wood covering, and a rough coat is laid on. After this the work is modelled in the stucco. Finish can be obtained by using flat brushes. It has a very loose and pleasant surface if done properly.

Stucco-work was much employed on the palace of Nonsuch, built by Henry VIII. It was executed by artists brought from Italy, but every trace of this palace has disappeared; but the men left their influence, and stucco was employed to decorate houses until the end of the reign of Charles II., when it began to decline.

Graffito, or sgraffito, is another way of decorating by means of prepared plaster grounds, cutting away or scratching through the upper surface, and revealing in parts a background of a different colour.

The first coat is made of sharp sand and Portland cement; the second coat is usually coloured with Indian red, yellow ochre, or manganese black. About one part of prepared distemper colour to one and a half of Portland cement is the proportion for this. Then a final coating of selenitic cement and silver sand carefully mixed together is laid on very thinly, not thicker than one-sixteenth of an inch, before the second coat is quite dry. Then the cartoon, having been prepared, is placed on the surface, and the outline firmly pricked and pounced, the cartoon removed and the design cut into the surface of the second coat, which is done with a steel scraper. Parian cement may be used instead of selenitic if the outer coating is desired white.

Care must be taken in cutting, which should be with slanting edges, which gives roundness and softness to the finished work. A good draughtsman will have little trouble in learning

this kind of work, and it should commend itself to architects for its durability.

Gesso is yet another way of using plaster, but this more properly belongs to the painter's art, and is most successful when confined to very low relief work, as for the decoration of frames, caskets, panels of cabinets, &c. There are many kinds of gesso, and fine examples may be seen in Kensington Museum. For bold work plaster-of-Paris and thin glue or size-water, a little tow pulled thin and steeped in the stuff is used for building up your projections; a few flat-headed copper nails are useful if they can be driven into the background to prevent the work lifting. This should really be applied to a wood or fibrous plaster background, and it is always necessary to stop suction by painting the ground over with a coating of thin shellac.

For fine work, laid on with a brush, glass is good for backgrounds; you can lay it over the design and copy through the glass. The liquid, which must be used hot, is composed of whiting previously soaked in water and mixed with linseed oil, and a little resin added.

The proportions vary, but it can be made very easily, and a few experiments will insure success. A pot of hot water should be kept handy to clean your brushes as the stuff cools. I have used, on the recommendation of Mr. Walter Crane, a very good stuff called "Denoline," sold by most colourmen. This is a fine powder done up in 1s. boxes, and is used by mixing with cold water only. You may make it stiff or liquid, as you require it. It sets hard but slowly, and sticks fast—great virtues in gesso. Whiting and parchment size is the gesso used by frame-makers; ordinary house-painter's putty worked up with whiting, oil and water, is also used for scrolls, &c. Carton pierre is a material much used in France, but I have had no experience with it.

I was told of a method employed by an American artist, which struck me as being very ingenious. He had his gesso prepared and put up in leaden tubes, similar to those used for oil colours. Then, preparing his background by tracing the design slightly on it, he squeezes the gesso on and flattens such parts that require it with an ivory or steel tool. For mere line design this way is admirable; works are done with great rapidity, much quicker than would be possible with a brush.

There are many processes for hardening plaster-of-Paris; one way is to dissolve a quarter of an ounce of soft soap in a pint of water, and an equal quantity of white wax is afterwards incorporated.

The cast is dipped in this liquid, or, if a surface of any dimensions, the mixture is laid on with a soft brush. After drying about a week, it may be polished with soft rag and French chalk.

Linseed-oil and wax is used by some, but this turns very dark in time and in places where hidden from the light it will become almost black.

Another way is to give the plaster a thin coating of white shellac, then paint over this a good coating of boiled soft soap and polishing when dry with a rag. This is useful for stopping the porous surface of the plaster, but it must be perfectly dry before the coating is applied. I am told a Mrs. Laxton Clark invented a means of hardening plaster, but I think all modellers would prefer putting their work in a more durable material.

The tools and materials required for gesso, stucco and similar work can be easily obtained at various oil and colour warehouses in London. I have found that a child's rubber ball cut in half is an excellent vessel for mixing small quantities in; it can be cleaned easily by merely turning inside out, and does not break; a few basins, a glue-pot, some iron plaster-spoons and some small steel spatulas are also useful.

I have endeavoured in as brief a manner as possible to explain some of the most important uses of plaster for decorative purposes; but to become thoroughly acquainted with any particular work the student should spend a short time in the workshops, for the secret lies not in the tools or materials, but in the hand and brain of the worker.

Mr. H. H. STATHAM proposed a vote of thanks to Mr. Lee and Mr. Pomeroy, which was seconded by Mr. W. D. CAROE and carried by acclamation.

PLANNING AND FITTING SCHOOLS.

THE code of regulations for day schools issued by the Education Department contains several alterations relating to the buildings, especially in rules 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16 and 17. The following is a reprint of the Schedule VII. in its latest form:—

Article 85 (a) of the code provides as follows:—"All new school premises and enlargements must conform generally to the rules contained in Schedule VII., and the plans must be approved by the Department before such new premises and enlargements are passed under this article."

RULES TO BE OBSERVED IN PLANNING AND FITTING-UP PUBLIC ELEMENTARY SCHOOLS.

School planning is the science of thoroughly adapting every part of a building, even the minutest detail, to the work of school teaching. Convenience of plan, suitable lighting, proper subdivision into classes and thorough ventilation, with warmth but without draughts, are its leading essentials. Attention to small points is of extreme importance. Sanitary laws are here as vital as in a hospital. The school-architect is recommended first to perfect his plan. His own skill should then enable him to clothe it with form, proportion, character and colour.

These building rules are intended to assist school managers, school boards and their architects to produce the most compact, convenient and economical plans of school buildings.

The annual cost of maintenance should be kept in view as much as the capital expense.

It is desirable that, before instructing an architect, the teaching staff of a school should be well considered, so that the number of rooms and the accommodation of each may be approximately settled before the expense of building is incurred.

REQUIREMENTS.

School boards and school promoters are requested to note that the Education Department require the following plans, and that inattention to such requirement entails delay:—

I. A block plan of the site, drawn to a scale of 20 feet to an inch. This plan must indicate:—

(a) The position of the school buildings. (b) Outbuildings. (c) Playground. (d) Drains (collateral and main), with their fall and depth below ground. (e) Entrances. (f) Boundary walls, or fences, and their nature. (g) Roads. (h) The points of the compass. (i) The levels of the ground at the principal points.

II. A plan of each floor of the schoolrooms (and teacher's or caretaker's residence, if any), drawn to a scale of 8 feet to an inch. The internal fittings of the rooms (fireplaces, groups of desks, benches, &c.) must be accurately shown. The plan should also state whether the rooms are intended for boys, girls or infants. In cases of enlargement, a plan showing the buildings as they exist is needed.

III. Sections and at least four elevations, also drawn to a scale of 8 feet to an inch. The ceiling, the positions of window-heads in relation thereto and the mode of ventilation must be shown.

N.B.—(a) Pencil drawings cannot be received, but coloured tracings in ink may be submitted while plans are in the preliminary stage of pencil, so that suggested alterations can be adopted without difficulty or expense. (b) Diagrams are of no value and cannot be accepted. (c) In the case of enlargements, the whole site and the existing building should be accurately shown. (d) All plans should be dated, the scales drawn on and dimensions figured.

IV. A detailed specification separated under the several branches of the building trade.

BUILDING RULES.

1. Planning and Accommodation.

1. In planning a school the first thing is to seat the children in the best manner for being taught. The accommodation of each room depends not merely on its area but also on its shape (especially in relation to the kind of desk proposed), the positions of the doors and fireplaces, and its proper lighting. The second point is to group the rooms together in a compact and convenient manner.

2 and 3. Schoolrooms.

2. Every school must have a schoolroom as hereunder or a central hall as under rule 8. The proper width for a schoolroom is from 18 to 22 feet. In a room 18 feet wide groups of long desks, three deep, should be used; where four rows are used the width should be 21 feet 6 inches, and if the width is 22 feet, dual desks, five rows deep, are most suitable. (For classrooms, see rule 7.)

(a) Accommodation in schoolrooms for elder children is calculated by the number of children seated at desks and benches, subject to a minimum of 10 square feet per child being provided. For the mode of calculating accommodation in classrooms see rule 7, in infant schools see rule 16 (f).

(b) Double bank schools (now almost obsolete) require rooms 32 feet wide, walls left clear for three rows of desks, and ample lighting from windows on both sides extending to ceiling.

(c) Wasted space cannot be considered.

3. The doors and fireplaces in schoolrooms must be so placed as to allow of the whole of one side of the schoolroom being left free for the groups of benches and desks.

(a) No schoolroom lighted from one side only can be approved. The gable ends should be fully utilised for windows (see also rules 9 and 9 (b).)

4. Walls, Floors and Roofs.

4. The walls of every schoolroom and classroom, if ceiled at the level of the wall-plate, must be at least 12 feet high from the level of the floor to the ceiling, and, if the area contain more than 360 superficial square feet, 13 feet, and, if more than 600, then 14 feet.

(a) The walls of every schoolroom and classroom, if ceiled to the rafters and collar-beam, must be at least 11 feet high from the floor to the wall-plate, and at least 14 feet to the ceiling across the collar-beam.

(b) Great care should be taken to render the roofs impervious to cold and heat.

(c) Roofs open to the apex are not approved. They can only be permitted where the roofs are specially impervious to heat and cold, and where apex ventilation is provided. Iron tie-rods are least unsightly when placed horizontally.

(d) The whole of the external walls of the school and residence must be solid. If of brick, the thickness must be at least one brick and a half, and if of stone, at least 20 inches.

(e) All walls, not excepting fence walls, should have a damp-proof course just above the ground line.

(f) The vegetable soil within the area of the building should be removed, the whole space covered by a layer of concrete not less than 6 inches thick, and air bricks inserted in opposite walls to insure a through current of air under floors for ventilation to joists.

(g) Timber should be protected from mortar and cement by asphalt or tar.

5. Entrances.

5. Entrances should be separate for each department. In large schools more than one entrance to each department is desirable (see also rule 10). The principal entrances should never be through the cloak-room. Entrance doors should open outwards as well as inwards. A porch should be external to the schoolroom.

6. Cloak-rooms and Lavatories.

6. Cloak-rooms must be external to schoolrooms and classrooms, with gangways at least 4 feet wide, amply lighted from the end. Hat-pegs should be 12 inches apart, numbered and of two tiers. The hanging-space necessary to provide a separate peg for each child is thus 6 inches lineal.

Thorough ventilation is essential, so that smells are not carried into the school.

Lavatory basins are needed (see rule 13 (h)). The girls' schools require a larger number than boys' or infants'.

A lock-up slop-sink, water-tap and cupboard are desirable for the caretaker.

7. Classrooms.

7. Classrooms are calculated at 10 square feet if not providing accommodation for more than sixty children. Six rows of dual desks or four rows of long-length desks are permissible in such classrooms. When the front of a class is narrowed, but the area of the room is not reduced, a seventh row of dual desks or a fifth row of long desks may be allowed. Rule 2 applies to all rooms providing accommodation for more than sixty, or being more than 24 feet 8 inches deep from the window wall.

(a) The minimum size of classroom is 18 feet by 15 feet. If desks are placed longitudinally the width should not be less than 16 feet. This latter width is also allowed in schoolrooms of very small size.

(b) The classrooms should never be passage-rooms from one part of the building to another nor from the schoolroom to the playground or yard, and should be on the same level as the schoolroom. Each should be easily cleared without disturbance to any other room. Doors should open both ways.

(c) The number of classrooms should, where practicable, equal the number of classes in the schoolroom; usually five classrooms are necessary for the six standards.

(a) The excessive use of movable partitions should be avoided.

8. Halls.

8. Large schools are sometimes planned with a central hall, from which the classrooms are entered, and which is not as a rule calculated in the accommodation.

In the case of mixed schools an exception is made, one class being necessary in the hall in order to secure a teacher's supervision of the separate exits to the latrines (see rule 13 (a)); the hall must therefore be suitable for teaching such class. It must be fully lighted, warmed and ventilated, and must contain a floor space of not less than 1,200 square feet, and the position of the class should be marked on the plan. Halls of excessive size are not approved.

9. Windows.

9. Every part and corner of a school should be fully lighted. The light should, as far as possible, and especially in classrooms, be admitted from the left side of the scholars. [This

rule will be found greatly to influence the planning (see rules 3 (a), 9 (b) and 11 (a)). All other windows in classrooms should be regarded as supplementary or for summer ventilation. Where left light is impossible, right light is next best. Windows full in the eyes of teachers or scholars are not approved. In rooms 14 feet high any space beyond 24 feet from the window wall is insufficiently lighted.

(a) Windows should never be provided for the sake merely of external effect. All kinds of glazing which diminish the light and are troublesome to keep clean and in repair should be avoided. A large portion of each window should be made to open for ventilation and for cleaning.

(b) The sills of the main lighting windows should be placed about 4 feet above the floor, and the tops of some should reach nearly to the ceiling with a portion made to swing. The ordinary rules respecting hospitals should here be remembered. Large spaces between the window heads and the ceiling are productive of foul rooms.

(c) Skylights are objectionable and should never be resorted to where windows are possible. Plans needlessly involving their use cannot be approved, except in the case of central halls having ridge, or apex, ventilation.

10. Staircases.

10. A staircase like a porch must be external to the schoolroom. No triangular steps or "winders" should be used. Each step should be about 13 inches broad and not more than 5½ to 6 inches high. The flights should be short and the landings unbroken by steps. The number of staircases should be sufficient, not only for daily use, but also for rapid exit in case of fire or panic.

11. Ventilation.

11. Apart from open windows and doors, there should be provision for copious inlet of fresh air; also for outlet of foul air at the highest point of the room; the best way of providing the latter is to build to each room a separate air chimney carried up in the same stack with smoke flues. An outlet should have motive power by heat or exhaust, otherwise it will frequently act as a cold inlet. The principal point in all ventilation is to prevent stagnant air. Particular expedients are only subsidiary to this main direction. Inlets should provide a minimum of 2½ square inches per child, and outlets a minimum of 2 inches. Rooms should, in addition, be flushed with fresh air from windows about every two hours.

A sunny aspect is especially valuable for children and important in its effects on ventilation and health.

(a) Although lighting from the left hand is considered so important, ventilation in summer demands also the provision of a small swing window as far from the lighting as possible and near the ceiling.

12. Warming.

12. The warming should be moderate and evenly distributed so as to maintain a temperature of from 56 deg. to 60 deg. When a corridor or lobby is warmed the rooms are more easily dealt with and are less liable to cold draughts. Where schools are wholly warmed by hot water the principle of direct radiation is recommended. In such cases open grates in addition are useful for extra warming occasionally and their flues for ventilation always.

(a) A common stove, with a pipe through the wall or roof, can under no circumstances be allowed. Stoves are only approved when (i.) provided with proper chimneys (as in the case of open fires); (ii.) of such a pattern that they cannot become red-hot or otherwise contaminate the air; (iii.) supplied with fresh air direct from the outside by a flue of not less than 72 inches superficial; and (iv.) not of such a size or shape as to interfere with the floor space necessary for teaching purposes.

(b) A thermometer should always be kept hung up in a school.

13. Sanitary Arrangements.

13. Water-closets within the main school building are not desirable, and are only sanctioned for women teachers. All others should be at a short distance and completely disconnected from the school. Privies should be fully 20 feet distant.

(a) The doors, staircases and passages leading from the schoolroom to the latrines (whether in mixed or in other schools), and the latrines themselves, must be separate for the two sexes, and constructed entirely apart from each other. In the case of a mixed school this rule especially affects the planning. Where passages or corridors are unavoidably used by both sexes, there must be complete supervision from the classrooms by sheets of clear glass.

(b) Each closet must be not less than 2 feet 3 inches wide nor more than 3 feet, fully lighted and ventilated and properly screened or supplied with a door. More than one seat is not allowed in any closet.

(c) The children must not be obliged to pass in front of the teacher's residence in order to reach their latrines.

(d) The following table shows approximately the number of closets needed:—

	For Girls.	For Boys.	For Infants.
Under 30 children	2	1	2
" 50 "	3	2	3
" 70 "	4	2	3
" 100 "	5	3	4
" 150 "	6	3	5
" 200 "	7	4	6
" 300 "	8	5	7

Urinals in proportion.

(e) Cesspits and privies should only be used where unavoidable, and should be at a distance of at least 20 feet from the school. (Building form "A," which may be obtained on application, gives suggestions as to their construction and arrangement.) Earth or ash-closets of an approved type may be employed in rural districts, but drains for the disposal of slop and surface water are still necessary. The proximity of drinking-wells should be carefully avoided.

(f) Soil-drains must always be laid outside the building (on a hard, even bottom or concrete) in straight lines with glazed stoneware pipes, carefully jointed in cement and made absolutely water-tight. A diameter of 4 inches is sufficient unless for drains receiving the discharge of more than ten closets. Above this number the diameter should be 6 inches. The fall should never be less than 1 in 30 for 4-inch, and 1 in 40 for 6-inch drains. An inspection opening or chamber should be provided at each change of direction, so as to facilitate cleansing the drain without opening the ground. Every soil-drain must be disconnected from the main sewer by a properly constructed trap placed on the line of drain between the latrines and the public sewer. This trap must be thoroughly ventilated by at least two untrapped openings, one being the 4-inch soil-pipe carried up full size above the roof and the other an inlet pipe connected with the side of the trap furthest from the public sewer. Automatic flushing tanks are desirable where trough closets are used.

(g) Urinals must in all cases have a sufficient supply of water for flushing.

(h) Waste pipes from sinks or lavatories should be first trapped inside and then made to discharge direct through the wall over a trapped gully.

14. Desks.

14. Benches and desks, graduated according to the ages of the children, should be provided for all the scholars, and placed at right angles to the light (see also rules 3 (a) and 9).

An allowance of 18 inches per scholar at each desk and bench will suffice (except in the case of the dual desk), and the length of each group should therefore be some multiple of 18 inches, with gangways of 18 inches between the groups and at the walls. In the case of the dual desk the usual length is 3 feet 4 inches and the gangways 1 foot 4 inches.

(a) The desks should be very slightly inclined. An angle of 15 deg. is sufficient. The objections to the inclined desk are that pencils, pens, &c., are constantly slipping from it, and that it cannot be conveniently used as a table. The objection to the flat desk is that it has a tendency to make the children stoop. A raised ledge in front of a desk interferes with the arm in writing.

(b) No benches and desks should be more than 12 feet long. And no group of long desks, in a schoolroom providing for more than 60 children, should contain more than four rows of benches and desks, or three if the width is less than 21 feet 6 inches (rule 2), because in proportion as the depth is increased the teacher must raise his voice to a higher pitch; and this becomes exhausting to himself, while at the same time it adds inconveniently to the general noise.

(c) With the use of the dual desk the space between seat and desk disappears, as the children stand in the gangways.

15. Sites and Playgrounds.

15. Every school should have an open airy playground proportioned to the size and needs of the school. The minimum size of site is, in the absence of exceptional circumstances, a quarter of an acre for every 250 children. If the school is of more than one storey this area may be proportionally reduced. The minimum open space is 30 square feet per child.

(a) In the case of a mixed school, playgrounds must be separate for the boys and girls.

(b) All playgrounds should be properly levelled, drained, enclosed and fitted with some simple appliances. A portion should be covered, having one side against a wall. A covered way should never connect the offices with the main building. Buttresses and corners should be avoided.

(c) An infant school should have its playground on the same level as the school, and open to the sunshine.

16. Infant Schools.

16. Infants should not, except in very small schools, be taught in the same room with older children, as the noise and the training of the infants disturb and injuriously affect the discipline and instruction of the other children.

(a) There must be no opening wider than an ordinary doorway between an infants' and any other schoolroom, because of the sound of the infant teaching.

(b) An infant school (and playground) should always be on the ground floor, and if more than 80 scholars are admitted, should have one gallery and a small group of desks for the occasional use of the older infants.

(c) No infant gallery should hold more than eighty or ninety infants. It should be well lighted from one side. The light for object lessons is as good from the right as from the left.

(d) The width of an infant schoolroom should be in proportion to its size, but not more than 24 feet. A covered marching-ground is desirable.

(e) The babies' room should always have an open fire, and be maintained at a temperature of about 65 deg. As a rule it should not contain more than fifty children. Large schools may require two communicating rooms for babies, one fitted with low Kindergarten desks, the other providing ample floor space for exercises.

(f) The accommodation of an infant school is calculated at 8 square feet for each child, after deducting wasted or useless space, but a larger area should be allowed wherever practicable. Care should be taken that the numbers are conveniently seated and that space is left for marching. Where a second standard is taught in an infant school the accommodation for it is calculated at 10 square feet per child.

17. Cookery Centres and Classrooms.

17. A cookery centre should be capable of accommodating at least one class of eighteen at practice and not more than fifty-four at demonstration at one time. It should be approached by a separate entrance. A small scullery is necessary and also a bonnet-room. A cookery classroom should contain at least 400 superficial feet, and be so placed that smells from it cannot pervade the other rooms of the school.

18. Workshops and Laundries.

18. Workshops and laundries are best entirely apart from the school.

19. Teacher's House, &c.

19. The residence for the master or mistress should contain a parlour, a kitchen, a scullery and three bedrooms; and the smallest dimensions which their Lordships can approve are:—

For the parlour	12 ft. by 12 ft.	of	8 ft. }	in height to wall
For the kitchen	12 ft. by 10 ft.	super-	8 ft. }	plate.
For one of the bedrooms	12 ft. by 10 ft.	ficial	8 ft. }	if ceiled at wall
For two other bedrooms	9 ft. by 8 ft.	area ;	plate, or 7 ft. to wall	plate and 9 ft. to ceiling

(a) The residence must be so planned that the staircase is immediately accessible from an entrance lobby and from the parlour, kitchen and each bedroom, without making a passage of any room.

(b) Each bedroom must be on the upper storey, and must have a fireplace.

(c) The parlour must not open directly into the kitchen or scullery.

(d) There must be no internal communication between the residence and the school.

(e) Windows should be carried up as nearly to the ceilings as practicable.

(f) There must be a separate and distinct yard, with offices.

(g) A caretaker's house need not be quite so large.

(h) All houses should be separate from and not built as part of the school-house.

20 and 21. Loans.

20. No loan of money can be obtained from the Public Works Loan Commissioners unless the whole cost of the school, exclusive of site, legal expenses, extra rooms for instruction authorised by the code, and residences (if any), is kept within the sum of 10*l.* per child accommodated. An allowance will also be made in reference to the cost of a central hall not calculated in the accommodation (rule 8). Rooms for extra subjects recognised by the new code, such as drawing, chemistry, &c., will have an allowance varying from 15*s.* to 20*s.* per square foot. From 275*l.* to 400*l.* will be allowed for a caretaker's house. From 275*l.* to 500*l.* will be allowed for a cookery centre. Whether the necessary loan be borrowed in the open market or not, extravagant plans cannot be approved.

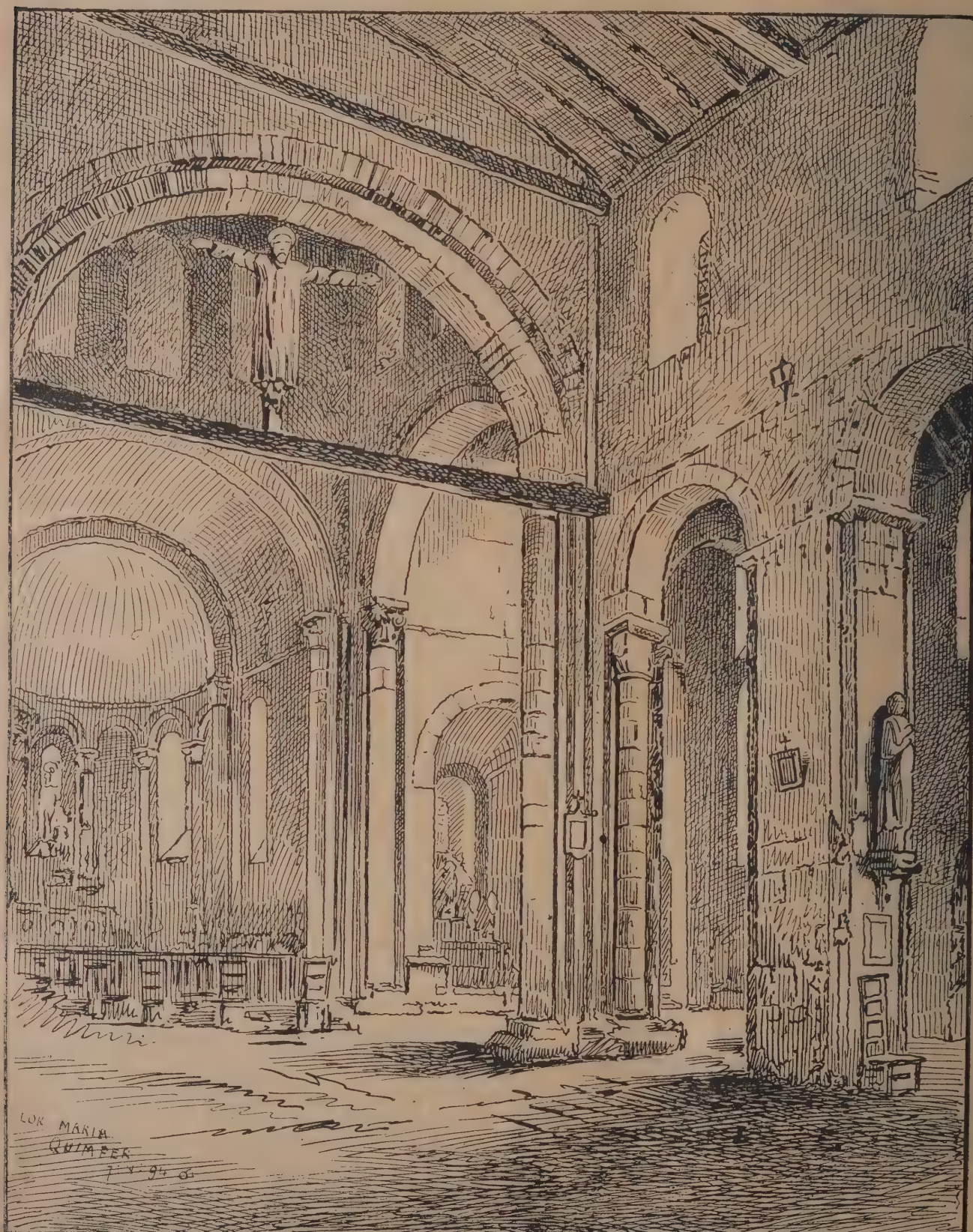
21. The Department do not entertain applications for loans when the expenditure has been incurred without their previous sanction.

Correspondence

Simplicity in Architecture.

SIR,—It was my privilege to attend the meeting at the Institute of Architects, when the several papers under the above heading were read—one by the learned President, and two others by accomplished architects not at present members of the Institute. The subject was an attractive one, and on speculating beforehand what its treatment might be, one had imagined the walls of the Institute hung with drawings of ancient architecture illustrating the spirit of simplicity of treatment, and one had thought of seeing in artistic form something perhaps

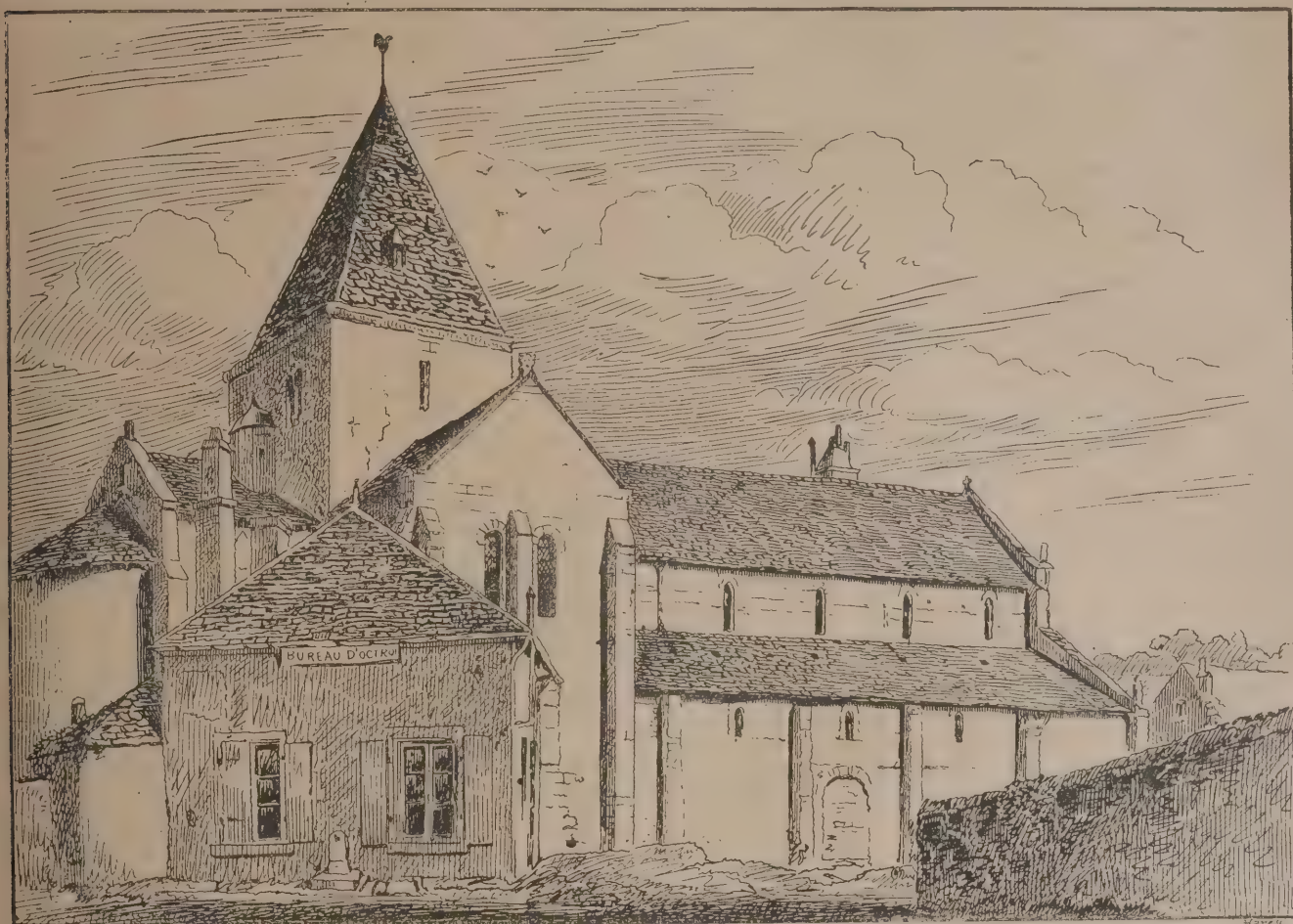
from Durham, Lincoln, Southwell, Gloucester, Tewkesbury, Winchester, Norwich, Peterborough or Ely; or, perchance, from some of the early and therefore simple abbey churches which abound throughout the land. Or otherwise one had thoughts of a selection from the many ancient parish churches or domestic buildings which display this excellent quality of simplicity to the utmost. Prior to the meeting, two hours (not warm ones on that bitter day) spent in the church of St. Saviour's, Southwark, suggested to one that perhaps that building, with its ample solids, nicely-proportioned parts and refined details, might in the evening furnish an example of true architectural simplicity (by the way, it is to be hoped that precious bit of untouched arcading at the south-west angle of the church will never have hand laid on it); but the papers took quite another line, and those present at the meeting had the pleasure of seeing what was provided as good



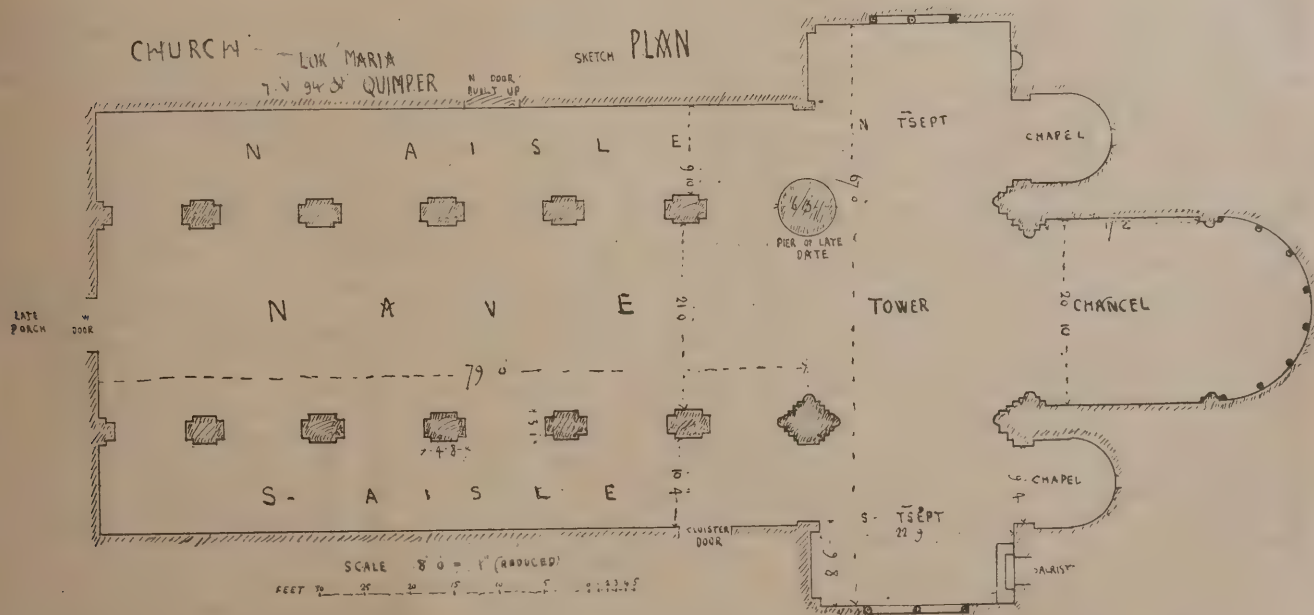
INTERIOR OF LOK MARIA, QUIMPER.

examples in illustration of the text. Mr. Halsey Ricardo showed a good sketch of a modelled "cherub's" head (*face* Welby Pugin), and in contrast with it a drawing of a hideous familiar advertisement; but in what way this concerned the subject of "simplicity in architecture" was somewhat of a puzzle to a stranger from the country, and the worst of it was that in order to give effect to this forcible contrast, the Della Robbia head was torn down at an early stage, and the wretched grotesque stared impudently at the assembly of

last year it was my delight to travel in France, Normandy and Brittany, seeing Dieppe, Rouen, Coutance, Léon, Dol, Mont St. Michel, Dinan, Lannion, Treguier, Morlais, Lamballe, Quimper, Auray, Carnac, Vannes and Chartres. Truly an architectural feast. Every day a festival. Amongst all these glories there was much of course which did not display true simplicity in the art; but, oddly enough, the subjects which did most forcibly express this great quality made most impression on one's memories. The mighty alignments of the great



LOK MARIA, QUIMPER.



artists the whole evening. If one might attempt a joke, one would like to whisper in the ear of the exhibitor, "What politeness did the advertiser send to your breakfast-table next morning?" But my intention was not to comment on the meeting at the Institute, much less on the papers read—that would be unbecoming; but it occurred to me at the time that a fitting illustration of "simplicity in architecture" might be sent to you from a sketch made last summer of a small yet interesting subject. For three weeks in the cold month of May in

monoliths at Kermario are a most impressive work, but this, of course, is too archaeological for Institute consideration. Yet one thinks monuments such as these (rude in the extreme though they be) need not be boycotted by the architect even in these elaborate "terra-cotta" days, for in truth they bring about what Professor Ruskin years ago said must take effect if architecture is "to tell"—they make an irresistible thrust to the heart. Then, again, La Crypte de l'Aquilon at Mont St. Michel, the aisles of the cathedral of Le Man and the

church on the hill at Lannion, the market hall at Auray and the early church of Lok Maria at Quimper may be cited as true examples of simplicity in architectural art. Quimper is full of Mediæval work, early and late, yet having once caught sight of its early church, all else for me gave way to its attractions. Its nave is very like the original nave at Bakewell, in Derbyshire. Alas! only the western bay there now remains. Thus I am able to send you in rough form what seems to me to be an excellent example of true simplicity in architecture—in plan, section and design. But it may be asked, is this the sort of thing to be held up as simplicity of treatment in these progressive days of easily-produced machine-made cast enrichments and elaborations? Well, on the one hand we have the simple innocence of the dutiful execution of the architect's own handiwork, together with perfect truth of construction, and on the other a mechanical multiplied reproduction from models not of the architect's own modelling. Each designer must make his choice in what direction he will employ his talents, but assuredly true "simplicity in architecture" cannot come of machine-made ornament, however profusely employed.

February 28, 1895.

C. LYNAM.

Specialties in Bills of Quantities.

SIR,—May I through your columns be allowed to draw the attention of architects and engineers to the following practice which appears to be growing, and the result of which, in many instances, is of a detrimental nature?

An architect having a building to erect issues bills of quantities, which certain contractors apply for and tender on. In these quantities the architect, through experience, specifies certain articles which are sometimes of higher price than goods of a more or less similar quality. Probably the larger number of contractors tendering make up their tenders on prices of the special material specified. The remaining two or three contractors use another method, viz. instead of the article specified they, knowing some manufacturer who offers to supply an article sufficiently good, fill in their quantities with the price of his manufacture, which may be some 5 per cent. or 10 per cent cheaper, they intending, if their tender is accepted, to get the architect's permission to change the specification. The foregoing naturally applies more to a mason's work in a building than to the later contracts; the result of which, in a 10,000*l.* contract, is, the builder who estimates according to specification finds that, though he has gone into the contract fairly and closely with only a small margin of profit, he is undercut by some hundreds of pounds by Jones & Robinson, who go in for the second method, and consider themselves sharp business people.

Some of your readers may say that the manufacturer asks bigger prices when specified, but in these times of competition this is not the rule. We all know a good article costs more than one of less quality. When certain articles are specified the manufacturer feels his goods are valued, that he has a reputation and for which he asks a fair price (his market price), which he expects to get, his future business not allowing him to cut the price at the expense of the quality.

When specifications are asked to be changed it is generally to benefit the contractor's pocket, which of course is all right unless it is detrimental to the quality of the work.

Take a given article from the bill of quantities:—"It shall be Blank & Blank's best A1 quality, equal to a certain specification." B. & B. know their A1 quality to be far superior to the standard specified, but, expecting a fair price, they supply the best quality as specified, feeling that the result of the work will bring them future business. Another manufacturer in the same line of business will undertake to supply an article to the standard specification at 5*s.* per ton or per thousand less cost, and which Jones & Robinson, the builders, estimate on; yet Blank & Blank know full well that they could supply a similar article at a much cheaper rate, and quite equal to the standard of specification, but their A1 quality being specified, they naturally prefer supplying it, knowing it will strengthen their reputation and lead to increased business.

If all contractors knew that architects would only allow specified articles to be used, far better work would be done. The fairest tenders would have a chance of being accepted, and the pockets of the architect's clients would not suffer for it.—Yours, &c.,

ONE WHO IS IN THE "KNOW."

March 4, 1895.

LEEDS ARCHITECTURAL SOCIETY.

AT the meeting of this Society, Mr. J. T. Micklethwaite, F.S.A., delivered a lecture at the Mechanics' Institute, Leeds, on "The Story of the Building of Westminster Abbey Church." Mr. E. T. Doddgshun (the president), in introducing Mr. Micklethwaite, said he was very well known in Leeds because of his connection with Kirkstall Abbey. Mr. Micklethwaite remarked that when we had the story of the development of one of our great churches it threw a good deal of light on other churches. These churches, as we saw them, were not

deliberately designed structures, but grew naturally, like a tree out of the ground. Some of our older abbeys, like Ripon and York, go right back to the seventh century, and gradually grew and became the great churches that we saw now, and he wished to show them how that happened at Westminster Abbey. Westminster Abbey was a national monument. It only became that by accident. It happened to be next to the residence of the king, and became the place of the coronation of the kings, and from the time of Henry III. onwards it was recognised as their place of burial. In the seventeenth century it began to be thought that burial in Westminster Abbey was the greatest honour that could be conferred upon a man after his death. That feeling grew up during the Commonwealth, and all the great men of the Commonwealth were buried there. The first Abbey was erected in the seventh century, but Bede, the great historian of the English Church at the time, did not mention it, though he mentioned York and Ripon, and we might take his silence as proof that in his time Westminster Abbey did not exist. In the eleventh century we get the fact that Edward the Confessor wished to build an abbey close to his house at Westminster, and there was an old abbey there. We were not told how old it was, but he set to work to rebuild it. The lecturer then traced the progress of the Abbey buildings, illustrating his remarks by references to plans, and showing how they continued to grow until the sixteenth century, every step being a definite step in the history of the Abbey.

GENERAL.

The Local Government Board have officially appointed Mr. James Green (Weatherall & Green, Chancery Lane) as valuer under the Manchester Corporation Act, 1894.

Lord Houghton, of Crewe Hall, Cheshire, has presented a site for a church on his estate at Blacon, near Chester. The work of erecting the new church will shortly be commenced, as half the sum required for building and furnishing has been raised.

At a Special Meeting of the Council of the Glasgow Institute of Architects, held in the chambers of Messrs. MacLean, Fife & Maclean, the president, Mr. T. L. Watson, in the chair, the secretary, Mr. C. J. MacLean, read letters which he had received from the Very Rev. Principal Caird, Sir John Stirling Maxwell, Bart., Sir George Reid, P.R.S.A., Sir Frederic Leighton, P.R.A., and Mr. R. Norman Shaw, R.A., intimating their acceptance and appreciation of the honorary membership which had been conferred on them by the Institute.

Mr. Percy Worthington, it is announced, will read a paper at the meeting of the Liverpool Architectural Society on Monday, the 11th inst., on "Churches of the Twelfth and Thirteenth Centuries in Burgundy."

Mr. Fowler, of Manchester, has been selected as engineer for a drainage scheme for the township of Helmsley.

Mr. C. W. Howden read a paper on "Organs and Organ Chambers" at the meeting of the Northern Architectural Association. His remarks were practically illustrated upon a small skeleton instrument provided for the purpose.

An Exhibition of the works of the members of the society known as Les Peintres Orientalistes Français is now open in Paris. There are works by MM. Gérôme, Benjamin Constant, Besnard, Renoir, Friant and others.

Mr. C. R. Carroll has been elected an associate of the Royal Society of Painter Etchers.

Mr. E. O. Sachs's paper on "Urban Fire Protection" has just been published by Mr. Batsford, of High Holborn, being the first of a series of "Studies in Municipal Economy."

Mr. A. Gilles, who was at one time the engineer for the docks at Southampton, died on Sunday in his seventy-ninth year.

A Lecture on "Art Tuition" will be given by Professor Herkomer at the Society of Arts on next Thursday afternoon.

Lord Mayo delivered a lecture in Dublin on Tuesday on the forthcoming Arts and Crafts Exhibition, which is to be opened on November 11. He said that what they lacked in Ireland were good designers.

A Tablet in commemoration of the opening of the Tower Bridge will be placed at each end of the structure. The tablet is of solid bronze, is 6 feet by 3½ feet in size, and weighs nearly 4 cwt. Ornamented at the top with the arms of the corporation of the City of London in bold and fine relief, it records the opening of the bridge by the Prince of Wales last summer, with the names of those who accompanied him, of the Lord Mayor and the sheriffs then in office, and of the aldermen and commoners composing the Bridge House Estates committee, whose device appears at the bottom. The name of the engineer, Mr. Wolfe Barry, is in the centre. The tablets have been cast by Messrs. Hart, Son, Peard & Co., of Drury Lane.

The Architect.

THE WEEK.

THE architects who carried out the self-imposed duty of meddling with the Bill which has become the Building Act of 1894 do not appear to have conferred many benefits on their profession or on the public. According to Sir JOHN BRIDGE, who is one of the most cautious of men in his speeches, "almost all the sections seemed to be so drawn as to be unintelligible; many were capable of two different constructions." The characteristics of amateur lawyers' work could not be more clearly described. The few cases brought before magistrates suggest that the Act is a colossal muddle owing to the twenty-two days' tinkering which the Bill underwent in the committee-room of the House of Commons. The case which came before Sir JOHN BRIDGE on Monday, and drew from him so decisive an opinion, related to Messrs. SHOOLBRED'S premises. Mr. WALLEN, the district surveyor, was summoned for declaring that plans of the altered premises were not in correspondence with the Act. It was supposed they were to be warehouses, but they were intended to be for domestic purposes, as residents for assistants, and counsel announced that they would have a magnificent character. Mr. WALLEN said he would admit they were domestic buildings, but as such they came under Section 41. That is the section which prescribes the diagonal line with its unlovely consequences. Sir JOHN BRIDGE inquired whether Mr. WALLEN understood the section, who remained prudently mute. The magistrate restricted himself to a matter of fact, and he decided that the buildings were to be used as offices, and therefore considered Section 41 did not apply. Mr. WALLEN'S objections were set aside or withdrawn. A district surveyor is bound to have the provisions of the Act enforced, but it cannot be expected that he will be able to convince people of his infallibility when he has to tacitly admit that he does not understand the clauses. The public cannot realise that the Act differs from most others in its unintelligibility. The district surveyor's position is, therefore, not enviable.

THERE is no mention of the Tope near the mouths of the Krishna, in the Presidency of Madras, in Mr. FERGUSON'S volume on Indian architecture, although it is larger than many examples which are described. According to a paper read by Mr. R. SEWELL before the Asiatic Society on Tuesday, the monument was of the most elaborate construction. First, foundations were dug deep in the soil, and a great circular base built of solid brick 148 feet in diameter. Above ground was a solid superstructure 5 feet high of large bricks, and in the exact centre of this was left a small cylindrical hollow, and the relic caskets were placed one above the other firmly built into the brickwork, the hollow being only about 9 inches in diameter. The outer caskets measured 2 feet 11 inches by 2 feet 6 inches and 2 feet 10 inches by 2 feet 3 inches respectively, so that it was abundantly clear that they could not at any time have been lifted out of the hollow. Above all this was constructed a dome, also of solid brick, having a base of 132 feet diameter, round which was a procession path of 8 feet broad. The whole of the outside surface was encased in marble slabs, so as to present a pure white glittering surface visible from a great distance. In the course of time much of the marble casing and the brickwork was removed by the inhabitants, and a few years ago a zealous officer of the Public Works Department utilised a quantity of the bricks for road-making, and most of the marble for the floor and walls of a small sluice in the canal close by. The caskets with the relics were respected in spite of all the changes which are brought about in two thousand years. The gold flowers, coins and precious stones are still intact.

"THE Monumental Effigies of Scotland from Thirteenth to Fifteenth Century" formed the subject of a paper read by Mr. BRYDALL, of the Glasgow Art School, before the Society of Antiquaries of Scotland, on Monday. The custom of carving monumental effigies in full relief, he said, did not appear to have prevailed in Scotland until the

thirteenth century the incised slab and a peculiar treatment of the figure in flat relief having been the previous monumental forms. While it was on record that certain tombs or effigies, such as those of The BRUCE and ROBERT II., were sculptured on the Continent and in England, the greater number were executed in Scotland. The destruction and dilapidation of these splendid works of art in Scotland was scarcely conceivable until the list was reckoned up. If they excepted the mutilated coffin lid of WILLIAM the Lion at Arbroath, the effigy known as MARJORY BRUCE at Paisley and the unidentified STEWART of Bute at Rothesay, they had no royal effigies left in Scotland. Of those of church dignitaries most had disappeared, while of those that remained none had escaped mutilation or decay. In strong contrast to the English effigies, with their beautifully enamelled heraldry and metal figures, the Scottish effigies, with the exception of two or three in marble, were of ordinary stone, and the only suggestion of the use of other material was in the hollows for the face and hands in the fine incised slab at Creich, also in contrast with England. There was no doubt that many of the Scottish effigied tombs were coloured and gilt. Mr. BRYDALL described the effigies at Arbroath, Swinton, Dundrennan, Douglas, Arbuthnot, Dunblane, Bourtie, Inchmahome, Paisley, Old Kilpatrick, Elgin, Fortrose, Aberdalgie, Rothesay, Renfrew, Cupar, Dunkeld, Beaully, Corstorphine, Falkirk, Dalkeith, Houston, Maryculter, Aberdeen, Borthwick, Seton and Rodell.

A PAPER on "Some Early Christian Antiquities" (unpublished) was read by Professor W. C. F. ANDERSON, M.A., before the Sheffield Society of Architects on Tuesday. The churches described were those discovered in 1893 and 1894 by an expedition in which the Professor took part. The first was a rock-cut chapel in a mountain side, about two miles from the valley of the river Mocestus, and three hours' ride north of the modern town of Bigaditch, in Mysia (Asia Minor). It is a projecting crag which hangs a couple of hundred feet above the valley below. The road is tufa, and in this is carved a church with porch, chancel and apse, and a side chapel. The church is very small, not more than 40 feet long from the door of the porch to the apse, yet all the features of a large church are imitated in this restricted space; the seats for the clergy with the bishop's throne in the centre run round the apse, the chancel is separated from the tiny nave by a triumphal arch, and the side chapel has a diminutive altar and credence table. Three crosses still remain over the inner doors, and a much mutilated wall-painting in the chapel shows that the church was originally decorated with emblems. There are many niches for lamps and votive offerings, and above the windows of the side chapel there is a carved relief, representing a dove standing in an arbour. The church is evidently an early one, but there seems to be no certain indication of its date. Similar chapels exist in Cappadocia and other parts of Asia Minor. Above the church is a small cell, also carved in the solid rock, which was probably the dwelling-place of a hermit priest who had charge of the shrine. The other churches are two discovered at the old Roman town of Doclea, in Montenegro. The larger is a basilica with an apse, a vestibule and a large court. It was paved with mosaic, and was decorated with many carved capitals, screens and windows. A large number of rudely-carved stone crosses point to there having been a number of altars besides the chief altar. The foundation of the seats of the clergy and the bishop's throne still remain, as does the platform on which the high altar stood. The date of the church is probably a little earlier than 500 A.D. The second church is much smaller, and is in the form of an elongated octagon. An inscription records that it was built by a lady called AUSONIA.

ON the 7th inst. Mr. CHARLES ALDRIDGE, architect, died at Claughton, near Liverpool. He held a good position among the architects of Lancashire, and at one time took an active part in the affairs of the Liverpool Architectural Society. Several churches were designed by him. Mr. ALDRIDGE was at one time a member of the Town Council of Birkenhead. He was fifty-three years of age.

JOHN BERNARD FISCHER.

ACCORDING to Mr. FERGUSSON, JOHN BERNARD FISCHER was "the most celebrated architect of his day." Yet, as often has happened with celebrated men, there is uncertainty about his name. In the baptismal register he is described as the son of "JOHANN BAPTISTA VISCHER, Burger und Bildthauer." MILIZIA and several other writers call him FISCHERS, and he appears to have sometimes adopted that mode of spelling. He claimed also to belong through his mother to the old and ennobled family of ERLACH, and his correct name would, therefore, be JOHANN BERNHARD FISCHER VON ERLACH. Genealogists and heralds have treated of his lineage and arms. If we refer to the subject it is only because, according to one theory, the architect, who was born in Grätz, in Bohemia, was of a family who came from the Netherlands. It is, therefore, not impossible that he belonged to the same family of craftsmen as PETER VISCHER of Nuremberg. The architect was a reformer of his art, for he caused the BORROMINI extravagance to be diminished, if not superseded, in Vienna and other places; nevertheless, he was as independent as any of the Dutchmen in dealing with Classic details.

As the register announces, his father, JOHN BAPTIST FISCHER, was a sculptor or carver of architectural ornament, and, as far as can be traced, the family seem to have been craftsmen. Mr. FERGUSSON gives 1650 as the year when the child who was destined to become so prominent in architecture was born, but that date is six years too early. The date given for FISCHER's death is also incorrect; it should have been 1723 instead of 1724. The uncertainty about time corresponds with the obscurity in other matters relating to FISCHER. Between 1656, the year of his birth, and 1680 is a term on which no biographer of the architect can illuminate. It is supposed that he studied in Prague, and was engaged on the Gallas'schen Palace; but the grounds for the belief are insufficient. His connection with that building was of a later date. In such cases it is wisest to assume that the ordinary course of instruction would be followed. The architect's father was an able man, and he was likely to utilise young FISCHER's talents as early as possible. In the seventeenth century both architecture and decoration were in a flourishing state in Austria. The terrible Thirty Years' War had come to an end in 1648, six years before FISCHER's birth, and efforts were made to restore the country to its former condition. Numerous artists from Italy were engaged on palaces for the nobles and churches. A sharp youth who was able to carve would find the best sort of instruction, which is practice in competition with men of experience, without going far from Grätz. FISCHER's father would be likely to give ample opportunities for study to his son. The elder was employed by some of the nobles of the district, and especially by the DIETRICHSTEIN family. The latter extended their favour to his son and grandson. It would, therefore, be not unusual if some of those nobles were attracted by the young artist, and became his patrons. It was probably aid of that kind which enabled FISCHER to travel to Italy, and to reside in that country during several years.

Italy was a school of the highest art before FISCHER's arrival and subsequently, but a number of causes combined in the seventeenth century to make it supersede all others for an Austrian. The empire was almost dominant over all Italy, and as some compensation for foreign rule Italian artists were allowed to have their own way in Austria. But there was another and more important relation between the two countries. In the struggle of the Reformation Austria was separated from Germany, and it was of vital importance to the Roman Court that Austria should be kept from following the new ways. The clergy contrived to gain the upper hand, and ruled civilians and soldiers. When ISOLANI, in "Wallenstein," is made to recount how, when he went to Vienna to arrange for remounting one of his regiments, he was sent to a Capuchin who had charge of that department, the poet was not drawing on his imagination. In all matters of taste the clergy were no less omnipotent. Among the means employed to gain power over laymen fascinating churches were prominent. The gloom and severity which at various periods characterised churches were ignored. Pictures of martyrdoms were not condemned,

but when they were introduced they were placed in a setting which imparted a different character to them. The indiscriminate employment of sculptors and painters as architects was operating to produce a result that was similar to what the ecclesiastics desiderated. Painting made sculpture more flexible than the Greeks or the early artists of the Renaissance could approve, and painters and sculptors tried to impart the same quality to buildings. Unfortunately the style became associated not only with orthodoxy, but with the new spirit of the Church. Walls could not easily be made suggestive of action, but in many places instead of planes we see projections that are convex and concave, and the divagations of mouldings are unprecedented. The old repose of architecture was treated with contempt, and restlessness was preferred. In Italy the people, with all their artistic aptitudes and familiarity with ancient examples, could not resist the new style. What chance was there for stemming its advance in Austria? In the churches of the seventeenth and eighteenth centuries in the cities of that country, we see a development rather than an imitation of the eccentricities which characterised the Roman churches of the revival.

At the time of FISCHER's visit to Italy the majority of the native architects would be engaged in working out the restless style that was the vogue. It is creditable to him that he was not carried away by the excitement. As a sculptor he would have been able to realise how much of the effect depended on a tricky dexterity, and when he had resolved, like so many other artists, to attempt architecture, his attention was given to work of a better time. In FISCHER's buildings it is easy to perceive an effort to combine two modes of treatment. There are in his churches especially parts which show the pure Italian spirit, but with them are other parts exhibiting a submission to the necessity of the time, which demanded novelty regardless of the sacrifice it entailed.

It is supposed that FISCHER had passed his thirtieth year when he returned to Austria. He was as versatile as any artist of the Renaissance. He could exercise the arts of the sculptor, painter, medallist, etcher and architect. But the Italian artists were not all turned adrift on his arrival. FISCHER's period of waiting for commissions was, however, shortened for him by one piece of luck. He received the appointment of teacher of art to the Crown Prince. That at once secured for him the notice of the Court and grandees, and future success was insured. Yet, strange to say, the first work which brought him reputation was a mere temporary structure, a triumphal arch erected in 1690, when FISCHER's pupil returned to Vienna as king of Rome. Architecturally it resembled the Roman arches, and it was enhanced by paintings, tapestries, &c. This scenic work—MILIZIA describes it as "un capo d'opera di stravaganza"—seemed to cause almost as much rejoicing as the coming of the prince. The Viennese felt they were not barbarians, for a countryman was able to erect a structure which surpassed what was done by the foreigners. A medal was struck to celebrate the occasion, and for a time FISCHER's arch was accepted as one of the wonders of the world. Commissions from the higher clergy and the nobles were forthwith offered for his acceptance.

The Archbishop of SALZBURG, in whose diocese Italians such as ZUGALLI and SOLARI had long possessed a monopoly, was one of FISCHER's first patrons. A church for the Ursulines displayed his capacity. Several other churches, a great presbytery, collegiate buildings and many others of an ecclesiastical character followed. Salzburg possessed a building, mostly of white marble, which was intended to shelter the archbishop's horses. FISCHER was employed to make some alterations in it, and his success led to the commission for the imperial stables in Vienna, which some critics consider to be the most effective of the architect's works. As stables the block has no rival. FISCHER was also employed in some works at the cathedral, but he was so reverential towards the design of SCAMOZZI and SOLARI that local archæologists are not agreed about what was undertaken by him. One of his most important works in Salzburg was the Church of the Trinity, which was commenced in 1694, in which there is an oval cupola which seems to be a first thought for one of the characteristic features of the church of St. Charles in Vienna. The University Church is another costly work that is well

adapted for solemn functions. It also shows in some parts his admiration for elliptical plans. In these buildings FISCHER was careful to give the preference to his countrymen who were painters and sculptors. In that way he accomplished an industrial revolution in Austria and one without parallel. The economic effects of FISCHER's control would form a subject for a treatise that would be more fruitful in suggestive conclusions than many which now obtain attention. The Austrian architect determined the question of foreign competition in an advantageous manner without other aid than his own courage and organising power.

The Salzburg buildings were ecclesiastical. Whether the Castle of Klessheim, which was a country house of the archbishop's, should be included among that or a secular class need not be discussed. FISCHER in many ways resembled modern architects rather than his contemporaries, and one of them was his production of illustrations of his proposed buildings. An etching of his design for the Schloss exists, and it suggests a late Italian villa, with an abundance of sculpture in prominent positions, and other details suggestive of sumptuousness. FISCHER was not destined to complete the building; in fact, it never was fully completed, nor was his design respected. The character which the building possesses was imparted to it by BERNARD STEWART, a remarkable man who merits notice in every book that treats of "the Scot abroad." He was born in the beginning of the eighteenth century, and did not reach his fiftieth year. Throughout his life foreign air oppressed him. He became a priest, and taught mathematics in the Salzburg University. He also practised as an architect in Austria. Schloss Klessheim was entrusted to him among other buildings. This remarkable man died in Italy in 1755.

FISCHER was more fortunate with the castle of Schönbrunn, which serves as an Austrian Windsor. It was not, however, erected on the feudal or English plan. Versailles was then dazzling all Europe, and big and little kings had set their hearts on something resembling it. As Mr. THACKERAY said, it is incalculable how much LOUIS XIV. cost Germany in imitations of the royal bigness and belongings. There were no millions in the Vienna treasury to be wasted over buildings, and accordingly Schönbrunn is only a stucco Versailles, although Austrian courtiers have been known to declare it surpasses the French pattern in style and surroundings, more especially as the selection of the site and the character of the buildings were supposed to be due to the genius of FISCHER's pupil, the Emperor JOSEPH I.

The nobles followed the example of the emperor in expending money on palaces. FISCHER's name must be remembered in Vienna as long as the Schwarzenberg Palace, the Liechtenstein'schen Palace, the Trautson Palace, Prince EUGÈNE's Palace, the Batthyany'sche Palace and others endure. Some of them would pass for Queen Anne or Georgian buildings if the fantastic window-heads could be removed. An architect who was so prominent deserved a title in a land where an addition of the sort brings respect. From 1705 FISCHER VON ERLACH was his name, and after his father's death his son, who was also an architect, was raised to a higher grade.

FISCHER's churches in Vienna are remarkable. His admirers hesitate about his part in the Peterskirche, a sort of imitation of the Roman building, because it does not correspond in style with any of the other works of the architect. But there is no doubt about his church of St. Charles Borromeo. It was the subject of a competition in 1715. The Emperor's taste was held as supreme in such a case, and he unhesitatingly decided in favour of FISCHER. We believe it is doubtful whether the two immense detached columns with the spiral bas-reliefs which stand in front of the building were represented in FISCHER's design. The church is on a novel plan; the central part of the façade is a Corinthian temple on a small scale, which is extended on both sides beyond the walls of the main building, with a pavilion flanking each end. Or we may describe the front as a long corridor leading from one open pavilion to another. The nave of the church is an ellipse on plan, with side chapels and a long chancel. Over the nave is a cupola which corresponds on plan with it. The innovation is not without its advantages. In circular or octagon churches, as in

Berlin and Brussels, the high altar loses its importance, for there is no reason why it should be in one position rather than another. But an elliptic plan almost appears to have a sort of apex, and when, as in Vienna, the chancel is deeply recessed, the attention is at once directed towards the most important part of the building. The exterior appears to suggest a great many parts, which appear to have independent uses, and in fact it would be easy to make several buildings out of the church, although the interior expresses unity.

FISCHER, as we have said, was fond of representing his works, but he sometimes neglected to produce views, and in consequence it is not always easy to identify his buildings. He did not restrict his skill to his own buildings. He brought out an immense architectural atlas, in which he tried to suggest the whole history of architecture. In many cases his views are only imaginative efforts, although valuable in suggesting that without proper evidence the clairvoyance of an able and practical architect is misleading. FISCHER was also as contemptuous towards Gothic as any fine gentleman of the eighteenth century. But his attempt was the first of its kind, and if with all the resources of modern times there is still no adequate representation of the variations of architecture, we should be merciful towards the effort of the Bohemian architect.

GREEK THEORIES OF ART AND EDUCATION.

A LECTURE was delivered in Dublin on the 6th inst. by the Rev. J. P. Mahaffy, D.D., F.T.C.D., on "Greek Theories of Education." He said he felt it his first duty to explain that the subject was by no means one of mere antiquarian curiosity, for the theories of the Greeks were worth considering by practical men and women of the nineteenth century. Most curiously old Greek life was more developed, more civilised, more modern in some respects than the Europe of the Middle Ages. It was common to say that the Greek race possessed such genius that educating them was an easy matter, but that was not the view taken by the Greeks themselves. They heard very little from them about natural genius. If any of them did great things in politics, in philosophy, in war, they would find in nineteen cases out of twenty they ascribed it, not to his genius, but his training. The question arose how far did they get with this training, and what did they do with it. He would take its most obvious result, their literature, the level that was attained by their historians, their orators and their poets. If they honestly compared what the Greeks had left them with that produced by all modern Europe they would only find their equals in the very greatest poets and thinkers, and they would have to call in Dante, Goethe and Shakespeare to rival their poets, Gibbon to rival their historians, and in many branches of literature, such as eloquence and philosophical prose, they would not find their equals even amongst the moderns, who used them freely as models. This literary excellence was continued through several centuries and was attained by a great number of writers, but among them all they would not find one case of what was called an original genius who made up for the want of education by his natural inspiration. They were all anxious artists, trained by masters and adhering to fixed principles in their literary work. It was remarkable, too, that almost all of them postulated a highly-trained and even learned audience, which not only took an interest in the larger and nobler problems of life, but were able to follow recondite allusions and subtle arguments. The people who could appreciate Æschylus or Sophocles were far more thoughtful and acute than any modern audience he could name. How was it then, it would be said, that they seemed to have accomplished so little in science? Were they sure it was little? What about Euclid's "Elements," so perfect and logical a text-book that all their schoolmasters to-day were afraid to venture upon any other elementary geometry? He could show that in mechanics, in higher geometry, in physical geography, and in hydrostatics the great men of Alexandria led the way to their modern discoveries, and that if the theory had not been found and the proper conditions defined of many of their modern problems by the Greeks, modern science might now be far more backward than many perhaps imagined. And they always professed that what they had attained was got not by genius but by training. The external circumstances of their education were of some importance to modern educators when they desired to institute a comparison between the ancients and the moderns. Regarding the burning question of female education, he could tell them nothing, for although Plato insisted in his ideal state that girls should receive exactly the same training, both physical and mental, as boys, that was only carried out to some

extent among the Spartans where the training was merely physical, together with some discipline in obedience and respect for the old. They were told that the results were physically excellent, but the Spartans set such small value even upon reading and writing that if they produced strong and beautiful women it was all that they aimed at, and, indeed, they knew that in times of war or other social disturbances these ladies were more turbulent and difficult to deal with than the enemy. They could put that out of account in the present discussion. They might be sure that there was high education for women at Lesbos at the time the island produced the poetess Sappho, whose fragments showed the very highest art, yet they only knew there were associations of young women for that purpose, whose freedom of speech and action caused no little scandal amongst the Greek societies who were in favour of the seclusion of women. In the famous tract of Xenophon upon the training of a young woman to be the efficient mistress of a house, he assumed that she came to her husband quite ignorant of all arts save those of dyeing her hair, painting her face, and otherwise improving her appearance. The habit of living in towns and not scattered through the country, as many of the richer classes were nowadays, made it possible for the great body of the nation to do without that great modern expedient, the boarding school, where boys were sent away from their parents and put into the hands of professional strangers, who trained them somewhat as the whippers-in trained a pack of hounds to their work. Not that the Greeks did not know the system as well. It was practically the plan adopted at Sparta, where boys lived till they were grown men in a sort of common barracks, quite separate from their parents in the same city, under discipline as regarded diet, deportment and military bearing. Though Plato highly approved of this plan, and thought that in the ideal state not only boys but even girls should be taken away from the charge of their parents, it was not thus that the great intellectual pre-eminence of the Greeks was attained. They did not find that any other State or any other practical educator, except perhaps Pythagoras, ever resorted to that unnatural and extreme expedient which induced so many people nowadays to pay large sums to escape the burden and the care of training their boys. The whole Greek system might be fairly described as a day-school system. Boys lived at home, and only went for some hours—not very many—to a schoolmaster. They knew that the number of subjects was very small compared to the school programmes of the present generation, and they might fairly compare it with that which educated their gentlemen and their men of letters fifty years ago, and all through the earlier time since the revival of learning. The selection of a few subjects was partly for necessity and partly for choice. There was not then the temptation to learn the history of all the world or its geography, or the applications of geometry and arithmetic; above all, they had not the mania now extant for pretending to learn several modern languages. In Greece, in her golden days, boys were only trained in the masterpieces of Greek literature, in a knowledge of the Greek poets, and perhaps of orators and historians; but when Greek culture spread to neighbouring countries, and Italians and other foreigners aspired to Greek culture, it was quite fixed that this could only be done through the Greek language; and so all that sought that training had to do in that way and that way only. Their great theory was that a boy should learn a few things, two or three great subjects, and learn them well, and not one that he should select, as lads may do in Oxford and Cambridge, and abandon all the sister studies which ought to distinguish a University man from the tradesman in a particular line. To allow parents or boys themselves a choice of subjects would never have been tolerated among the Greeks unless it was the desire of the parents to bind their son to a trade, in which case the master taught him but one thing, and he became a mechanic or an artist, and did not aspire to the higher walks of life. It was another part of their theory that they should not learn out of books, or by reading up books at home, or by being examined in books, but by the living voice and intercourse with the teacher. It might be said that if the Greeks had discovered printing they would have used books in education as they were used at present. The lecturer did not think so; they had just as many books as they wanted. Papyrus was cheap, and there were plenty of book-sellers and trained slaves to copy out books in a neat and precise hand as different from ordinary writing as type was. They could not think what a benefit slave labour was to a nation which had not our appliances for multiplying work by machinery. An Athenian could have procured as many primers as he wished for at a cost not much greater than he could at the present day. Education was with the Greeks essentially a State affair. As regards music, it was the habit to teach boys a certain amount of singing and playing, for they regarded music as having a close relation to morals, and were wont to guard carefully against the practice of what they called immoral music—immoral not because of the words, but because certain scales and harmonies were of a loose and relaxing character and un-

strung the mind, while others were manly and inspiring, promoting bravery and temperance. That was one of the fundamental contrasts between our notion of school training and theirs. It did not occur to them in the present day to examine whether Chopin or Beethoven may not have a secret moral or immoral effect upon those who study them; they took it for granted that music, like drawing, was a mere artistic pastime, not harmful in itself, though it might be associated with harmful objects. Both the Greeks and they in these countries agreed that physical exercise was an essential part of education, and it was to this agreement that they might attribute the superiority which the Greeks in the past and they in the present day showed over the other nations of Europe. Turning to what corresponded amongst the Greeks to university education amongst us, there was a certain class, with means and leisure, who, after their boys had got their ordinary schooling and had done their compulsory military service, desired to train them for public life and for the professions. They must remember that university education in their minds, and in the minds of any people who thought about it now, was not a theory for the masses. The notion underlying the new schemes here and in England, and which underlay what many thought a great sham, called the University Extension movement, was that every sweep and tinker had a right to University education. It was of course perfectly absurd. What such classes wanted—he meant in the sense of what they ought to get—was a thorough technical education in the trades which were within their reach, and which should be maintained in order that the country might prosper. The son of a farmer with twenty acres or less had no claim to learn Greek and Latin, and thrust himself into the learned professions, where he would be an inefficient and discontented member of a society which justly despised him. What he wanted in the proper sense was to be taught to plough, an accomplishment which he (the lecturer) was told was quite rare in this country and commanded high wages, to read and write, to keep simple accounts and to learn what was good and efficient farming, superior methods of managing land and feeding cattle, instead of spending his father's earnings in setting up as a tenth-rate doctor or lawyer. He was not by this severance of classes into university and non-university classes advocating the suppression of genius. That was absolute nonsense. A boy who really had genius had had for the last century, and had now, ample means of rising out of his obscurity. They would find it hard by any system to choke genius. The real danger was to puff up the average boy. Above all the Greeks had never condescended for one moment to the theory that by mere examinations they could pronounce a man educated, or that by competitions in books they could select the fittest candidate for the public service. They insisted that their pupils should never be in a hurry to know this or that, or be qualified to hold this or that appointment, but that they should regard higher education as a matter of leisure. The very word school meant leisure in Greek. It seemed to be the ideal of the modern Radical that by a succession of schools—primary, secondary, intermediate, collegiate or whatever the jargon was—the pauper could be made a labourer, the labourer a farmer, the farmer a mechanic or shopkeeper, the shopkeeper a professional man, the professional man, he supposed, a political thinker, the political thinker a legislator and so on, to whatever the highest goal of mankind was, and that when such a system of raising the poor and ignorant was perfect they might, with the aid of the accumulated wealth of the idle classes, which was to be solemnly and with great show of justice looted, attain to a more and more perfect happiness in this world, ending, he supposed, in a millennium, not under a theocracy, but under a one man one vote democracy.

In his second lecture Professor Mahaffy treated of "Greek Theories of Art." He said he must first enter into some general considerations upon art which were necessary to the understanding of the principles followed by the Greeks. Had they ever, he asked, thought out for themselves what the domain of art was or what it desired to accomplish? The subject was not without obscurity and difficulty, but they had three great ideas of perfection first analysed by the Greeks and since adopted by all thinking people as the only possible forms of the ideal. They were the good, the beautiful and the true. Whether those three were or were not ultimately reducible to one, whether they did not merge into the knowledge of the source of all perfection, was a metaphysical question beyond their present scope. For us the three were distinct, while the science of morals aimed at the good and the true as aiding the good, and the science of æsthetics (to use a very misused term) aimed at the beautiful and the true so far as it aided the beautiful. The two sciences were certainly in our practical life quite distinct, for while those who devoted themselves to the pursuit of the beautiful were very careless about the good, we knew from the experience of our pious people, especially of the Nonconformist Protestants, that those who were keenest about the pursuit of the good cared very little for beauty. They had to rise to the heights that Plato did to grasp

that no true beauty could exist save in what was good, and *vice versa*. What he was, however, now concerned with was rather the relation of the true to the beautiful, for while the latter ought to be in every case the aim of art, yet so important in the matter was truth that most of the world's art had failed and decayed from neglecting that great condition. Men had tried to construct the beautiful at the expense of the true, and so art had become unreal, and as soon as art lost touch with the true, which was only another word for reality, it lost its hold upon men and fell into neglect and decay. But, on the other hand, if the study of the beautiful and its representation in art were to confine itself absolutely to reality, and never condescend to violate truth, then art would lose its great function, which was to create ideals for men, to show them beauty greater and purer than that of ordinary life. Whether in music or poetry, or in sculpture or in painting or in architecture, the same great law held good—if art did not bring us nearer to the ideal, to something higher than ordinary life, it was no true art. There was an apparent exception in the case of realistic painting, which he only mentioned to caution them against being misled by it. There were portraits of ugly people with wonderfully accurate and rich drapery and furniture. But accuracy, though admirable, was only to be commended as a very perfect handicraft, as a great difficulty overcome by skill and patience—nay, won by a natural gift. Art must seek beauty while not abandoning reality; yet as art must endeavour to translate the real into the ideal, so some truth must be sacrificed to beauty, while no doubt some imaginary beauty must be sacrificed to truth. The perfection of the art of a nation, of an epoch, or of a man consisted in the instinct with which those two contrasted elements were combined. That was artistic genius, and in it the Greeks excelled all the nations of the earth, for they understood how to combine the unreal and the real with a boldness and tact which surprised the modern critic. Professor Mahaffy illustrated this tendency amongst Greeks by referring to their representations of centaurs on the Parthenon, which he described as an unreal and impossible animal creation. Turning to a far more curious case, poetry, it might be said here, at all events, they began with the natural. Nothing of the kind. Homer, the first great master who opened a new vein, was not a child of nature, but was highly artificial, and according as each new species of poetry arose there was still artificiality. It was still more remarkable in their oratory, and when Demosthenes broke through some of the unrealities of earlier oratory, and allowed himself liberties to make his speech seem natural, it was only in the most sparing way and without sacrificing the taste for artificiality that underlay Greek art. The Greeks knew as well as he did that great poetry, like great music, should not be descriptive but suggestive. The Greeks had no inspired books (in the sense of the scriptures) in any established moral system in their religion, and therefore they were obliged to seek the moral emotions which were to be found in religion and in their art, by which he meant their poetry and their music. That made them accentuate their poetry in a way wholly foreign to the present higher criticism, to which a strong moral intention, the working round of a story into a sermon in praise of virtue or in censure of vice was most distasteful. A poet who posed as a moral teacher in that sense was now considered almost to have betrayed his mission, to have sacrificed the ideals of art to the commonplace of morals. Not so the Greeks. Very few of those present would take up Homer as a moral teacher, yet he was taught to centuries of Greek children, as the Bible was taught, with comments and explanations to show how all the private and the civic virtues were inculcated in his poems. It was possible with a good deal of contrivance to effect this with Homer. It was not so with the early lyric poets. But with regard to the tragic poets, who had openly professed that their main object was to make men better, it was true that their main object was well disguised and presented in the solution of great and tragic problems. It was not the commonplace instruction of proverbs or of children's rhymes, but nevertheless the moral intent was there far more consciously and definitely than it was in Shakespeare. The case was even more remarkable and curious when they came to read the consistent and repeated declarations of the theorists about Greek music. They were in a far worse position as regarded the possibility of appreciating what was thought in this case. For while there was more than enough great Greek poetry extant to enable them to form an opinion on this point, the remains of the Greek music was wholly strange to those of the present day. They possessed the notation, and could set down the notes of the recovered passages with certainty, but there resulted a succession of sounds which they could not reduce to any modern melody or harmony without taking the wildest liberties. Nevertheless, the Greeks who, in all the other arts which they transmitted to us were our acknowledged masters, never for one moment suggested that their music was inferior to their other arts. But any modern musician would be ashamed to produce the "Hymn to Apollo," and yet to this stuff the Greeks attributed the most momentous

moral influences. What was the meaning of all this? They must remember that on the question of art they must attend carefully to what their greatest masters had to say. The problem was not ripe for solution until they had recovered more Greek music, and could understand both their melody and their harmony if they had any. But the constant presence of this Greek theory had led him (Professor Mahaffy) to believe that the moral influence was vastly underrated which mere music, apart from words, had upon the minds of youth. It was the modern habit to set children to learn the subtle art, which, if they had any deep feeling for it, probed them to their inmost soul, and stirred within them a crowd of half-conscious emotions. Yet even now they suspected that in so doing they might be producing some queer moral disturbance in their nature. Who knew whether the constant repetition of the emotions excited by a nocturne of Chopin, or an adagio of Beethoven, might not in the end mould the character and set the mind upon subjects which had better be left alone? Who knew whether the temper might not be injured, the virtues of patience and endurance, the precious gift of constitutional contentment, might not be filched away from it if they were perpetually agitating their souls with the storm and strife of Wagner's rhapsodies? The Greeks would give an answer in the affirmative. They would urge that all these vague, undescribed emotions, which are and ought to be excited by music, have their effect upon the whole moral nature, and they would point to the lives of famous artists to show how deleterious this art had been to their morals. The poetry, sculpture and architecture of the Greeks were certainly on a higher level. Their painting may have been so, but their music was exceptionally inferior. Then this strong opinion about the moral value was even more difficult to explain away. But the probabilities were surely that men who had so subtle and sure an instinct for the charm of the voice in language, whose poetry was so essentially melodious, could hardly have been mere children groping in the dark in the treatment of sustained tones which would produce music. If so, here was a whole department of education upon which they had no theory at all, and which required searching investigation. Or if artistic talent was now indeed dissociated from moral nature, then the modern human being was far more different from the old Greek than any of them could imagine. He now turned to a great contrast between Greek art and modern day art. It was that, while among the Greeks all the fine arts were closely associated, with modern art they were almost wholly disassociated. In Grecian times poetry was not meant to be read or even recited so much as to be sung to music. The poet was essentially a singer, and the whole province of music was to accompany poetry or that rhythmical movement which was called dancing. Discounting some rare exceptions, it might be declared that none of the fine arts amongst the Greeks were isolated, but always appeared in close association with the sister arts. He might go further and say that they were associated by the cognate nature of the subject-matter with which each and all were concerned, and that subject was religion. This, then, was what he meant by this large harmony of all Greek art which produced a consistent effect upon modern art as it did upon the Greeks, and, so to speak, forced each of the Muses to keep pace with her sisters.

TESSERÆ.

Effects of the Artist's Personality.

THE dead, inanimate material that the artist handles—be it a lump of clay, a stretch of canvas, a heap of stones—is quickened into life, transfigured by the man's communication of his own spirit to the thing. The stretch of dead canvas becomes sensitive and alive under Leonardo's hands, and the thing painted is immortalised; for the flesh of Mona Lisa still glows, the pulses of her neck seem still to palpitate, the carnation upon her cheek is still there, the wistful eyes still gaze out beyond the picture, beyond you and into eternity. The face of the landscape that Wordsworth and Turner painted had nothing uncommon about it to the eye of the village yokel, but the man of genius as he paints it imparts to the picture by some subtle magic his own unique imaginative expression, and lo! it acquires a new influence—the added gleam—"the light that never was on sea or land, the consecration and the poet's dream." It would seem then that a work of art—poem, building or painting—gets its singular gift of attractiveness from the personality of the man. The artist strikes the imagination of others by pressing into his work his own imaginative qualities. Sir Joshua Reynolds puts the matter thus:—"It is not the eye, it is the mind which the painter of genius desires to address." The artist, he says, will not "waste a moment upon those smaller objects which only serve to catch the sense, to divide the attention, and to counteract his great design of speaking to the heart, and it is this power of address that entitles painting to rank as a sister of poetry."

The Horizontal Line in Composition.

It was a remark of Stothard that "great grandeur might be obtained either by a very high or a very low horizon; but when the horizon is placed in or near the middle of the picture, grandeur of composition must be sought from some other principle." In many of his own pictures we have fine examples of the advantage of a high horizon, and Titian's *Peter Martyr* affords a noble instance of the grandeur of a low one; indeed, Titian's compositions of *The Death of Abel*, *Abraham and Isaac* and *David and Goliath* owe much of their grandeur to the horizon being entirely below the boundary of the picture. This choice was suggested by the adaption of those great works to ceilings; but there is no reason against such a choice in pictures that are to be hung above the eye and a strong reason in favour of it, namely, that the effect will be truer. Hogarth's facility and taste in composition were very great, but some of his interiors would have been more true in general effect had he placed his point of distance farther from the plane of the picture, or been less fond than he was of oblique perspective. This is particularly observable in one of the most admirable of all his works, the breakfast scene of the *Marriage à la Mode*, in which neither the floor nor the ceiling appear to be level unless the eye is placed so close to the picture as to be unable to see any part of it perfectly. Hogarth seems to have considered it to be always proper that the spectator should suppose himself to be in the apartment represented. But there is no absolute necessity for this. The side of the room not represented may be imagined open, as in many of Wilkie's compositions and as in scenes on the stage; indeed, it is best as a general rule to suppose the eye of the spectator to be at a distance from the surface of the picture equal to a line drawn diagonally across it from corner to corner. The Dutch painters of interiors have generally adopted a nearer point of distance, but then they always preferred parallel to oblique perspective, and this choice greatly assists the level look of their floors and ceilings. They often, both in interiors and exteriors, availed themselves of the advantage a near point of sight gave them in introducing one or two long oblique lines, which, as they managed them, gave much grandeur and effectually excluded a tame or commonplace appearance from compositions in other respects extremely simple. As to lines and forms of beauty, the serpentine line is unquestionably, in itself and alone, more beautiful than the straight line, and a round or oval form more beautiful than a square one. But every line in turn becomes a line of beauty from situation and contrast, and in the same way every form may be made an object of beauty. Hogarth recommended the pyramidal form of composition as the best, but nature, by the laws of perspective makes every form of composition in its turn agreeable to the eye; and though in Hogarth's works we trace much of the pyramid, yet he did not adhere to it so constantly or so rigidly as to give too great an appearance of artifice. One thing may be said in favour of the pyramid, where the composition rises high above the horizon—that it conforms to the law of perspective by which all perpendicular lines terminate in a point. It is not a little curious that Hogarth in his eagerness to support a favourite theory, tells us that the sculptors of the Laocoon made little men of the sons rather than violate the principle of the pyramid in the composition of the whole. He had perhaps never seen a cast of the original group, and may have known it only from bad engravings or copies, otherwise it is inconceivable that he could have mistaken the boys for little men. His "Analysis of Beauty" is, however, a book that every painter should read, as it can never be consulted without profit, if the reader be on his guard against too implicit a reliance on the reasoning of the author where his theories of the serpentine line and the pyramid are concerned.

Dreamers and Workers.

There is, in the present day, an overplus of raving about genius and its prescriptive rights of vagabondage, its irresponsibility and its insubordination to all the laws of common sense. Common sense is so prosaic. Yet it appears from the history of art that the real men of genius did not rave about anything of the kind. They were resolute workers not idle dreamers. They knew that their genius was not a frenzy, not a supernatural thing at all, but simply the colossal proportions of faculties which, in a lesser degree, the meanest of mankind shared with them. They knew that whatever it was it would not enable them to accomplish with success the things they undertook, unless they devoted their whole energies to the task. Would Michel Angelo have built St. Peter's, sculptured the Moses, and made the walls of the Sistine sacred with the presence of his gigantic pencil, had he awaited inspiration while his works were in progress? Would Rubens have dazzled all the galleries of Europe had he allowed his brush to hesitate? Would Beethoven and Mozart have poured out their souls into such abundant melodies? Would Goethe have written the sixty volumes of his works—had they not often, very often, sat down like drudges to an unwilling task, and found themselves

speedily engrossed with that to which they were so averse? "Use the pen," says a thoughtful and subtle author; "there is no magic in it, but it keeps the mind from staggering about." This is an aphorism which should be printed in letters of gold over the studio door of every artist. Use the pen or the brush; do not pause, do not trifle, have no misgivings; but keep your mind from staggering about by fixing it resolutely on the matter before you, and then all that you can do you will do; inspiration will not enable you to do more. Write or paint; act, do not hesitate. If what you have written or painted should turn out imperfect you can correct it, and the correction will be more efficient than that correction which takes place in the shifting thoughts of hesitation. You will learn from your failures infinitely more than from the vague wandering reflections of a mind loosened from its moorings. Because the failure is absolute it is precise—it stands bodily before you—your eyes and judgment cannot be juggled with—you know whether a certain verse is harmonious, whether the rhyme is there or not there; but in the other case you not only can juggle with yourself, but do so—the very indeterminateness of your thoughts makes you do so. As long as the idea is not positively clothed in its artistic form it is impossible accurately to say what it will be. The magic of the pen lies in the concentration of your thoughts upon one object. Let your pen fall, begin to trifle with blotting-paper, look at the ceiling, bite your nails and otherwise dally with your purpose, and you waste your time, scatter your thoughts and repress the nervous energy necessary for your task. Some men dally and dally, hesitate and trifle until the last possible moment, and when the printer's boy is knocking at the door they begin. Necessity goading them, they write with singular rapidity and with singular success; they are astonished at themselves. What is the secret? Simply this, they have had no time to hesitate. Concentrating their powers upon the one object before them they have done what they could do.

Grouping in Painting.

Nature everywhere arranges her productions into clusters, and to this end she employs a variety of means. The heavenly bodies are grouped by attraction, flowers and trees by the natural means by which they are propagated, while the social instincts congregate man and most other animals into societies, and the same instincts impel in man as well as in many of the inferior creatures the grouping of their habitations. Grouping is therefore an almost universal law of nature, and a scattered display of objects, though it may sometimes arise from accident, is in interruption of this law; and we consequently find that grouping in art is agreeable to the eye, and though single objects are also agreeable, we are never satisfied with a scattered look in composition. In observing crowds in the street or groups in a drawing-room we notice many repetitions of similar attitudes, and in herds of cattle, flocks of sheep, &c., we remark this also. Repetitions of forms and shapes are likewise of frequent occurrence in trees, flowers, the outlines of mountains, clouds, &c. Now the picturesque styles of composition, as they are called, avoid the imitation of these appearances as too formal for art; but this, like every other rejection of a natural principle, only produces mannerism—which sort of mannerism was carried to its greatest extreme by the French painters of the time of Louis XV., painters who are now all but forgotten. It is true there is another extreme in some styles in which the repetition of attitude becomes pedantic or theatrical, as in the "Oath of the Horatii" by David; but in the best compositions of Masaccio, of Raphael and of Poussin, these repetitions occur exactly as they do in nature, and in the works of the best landscape painters, and particularly of the Dutch and Flemish schools, we see the repetitions of forms in inanimate objects given with the same unaffected truth. It is such modes of treatment in which the true artlessness of art consists; artlessness which is indeed the perfection of art, and the farthest possible removed from that artlessness which arises from ignorance, the artlessness of very early art and of the designs of clever children. Peter de Hoo, the most consummate painter in his particular style that ever lived, whose pictures, to those who are content with the humble subjects he for the most part gives us, leave nothing to be desired, is a far more artless painter, in the sense in which artlessness is to be admired, than Cimabue. There is so little of the appearance of study in his compositions that they look as if anybody could have put the objects they contain together as he has done it. But let the attempt be made, and the difficulty will at once be felt; or let it be attempted to improve any one of his lines, and the impossibility will soon be discovered. Art never has been and, we may well believe, never will be carried to greater perfection in its technical qualities than in some of his works. All improvements in composition, from the infancy of art to its full maturity, are strictly and solely the result of the discovery of the principles by which nature makes assemblages of objects agreeable to the eye, sometimes by giving variety to regular forms or groups, sometimes by giving regu-

clarity to forms in themselves irregular, and always by giving unity to multitude and subordination of many objects to one, or to a few; and in all that relates to forms or to lines it is chiefly perspective that does these things. Linear perspective is, therefore, the basis of linear grouping, and until its laws were well understood composition remained imperfect, whatever beauties it occasionally put forth being accidentally obtained by the lucky chance of the correct copying of the appearances of nature, but with no certainty of repetition, the causes of the appearances not being understood.

The Proportions of the Great Pyramid.

The conclusion has been drawn from the angle of slope of the casing-stones discovered by Colonel Vyse that the builders of the Pyramid were acquainted with the ratio of the circumference of a circle to its diameter, a piece of knowledge they were desirous to embody in its dimensions. In fact, the slope of the original faces of the Pyramid comes out from Vyse's (or Perring's) measurement of the linear dimensions of these stones, $51^{\circ} 52' 15''$, and by Brettel's measure of their angle, $51^{\circ} 50'$, the mean of which differs only by a single second from the angle whose cotangent is the length of an arc of 45° of the circle, so as to make the whole periphery of the base all but mathematically equal to the circumference of a circle described with the height for a radius. So stated, the coincidence is certainly very striking. It by no means follows, however, that the ancient Egyptians were in possession of any calculus by which they could have arrived at a theoretical knowledge of the true ratio. It should be observed that the linear measures above mentioned are given only to entire inches, and those inches of a scale which may or may not have been verified with extreme precision, and therefore can lay no claim to minute accuracy. Computing, moreover, on these measures alone, the ratio of the periphery to the height comes out 6:2784, while that resulting from the direct measure of the angle is 6:2878, the true ratio being 6:2832. The individual results differ by 1-640th part of the whole quantity, and as we do not know with what instruments or what precautions the angle was measured, and it is given only to the nearest minute, it seems but reasonable to admit an equal proportional latitude of uncertainty in the original workmanship and in the numerical relation to which it was intended to conform. Now this is a very considerable approximation, much better than that of Archimedes a thousand years later. Still it would be easy for people in possession of such appliances as they must have had at command to ascertain the ratio in question to this or even to a greater degree of precision, by tracing, for instance, on a flat pavement a circle of 100 feet in diameter, and actually measuring the circumference. This they certainly might have done to the nearest 3-foot, which, on a length of 314 feet, would correspond to such a latitude of error. If aware of the importance of the problem, they might have gone much further. But, again, it by no means follows from anything which the dimensions of the Pyramid indicate, that they did possess a knowledge of the ratio of the circumference of a circle to its diameter, even approximately. By a very remarkable coincidence, which Taylor has the merit of having pointed out, the same slope, or one practically undistinguishable from it ($51^{\circ} 49' 46''$), belongs to a pyramid characterised by the property of having each of its faces equal to the square described upon its height. This is the characteristic relation which, Herodotus distinctly tells us, it was the intention of its builders that it should embody, and which we know now that it did embody, in a manner quite as creditable to their workmanship as the solution of such a problem was to their geometry. There is another, and a remarkable relation, viz. that the height of the Pyramid, including the casing, and measured from base to apex, supposed to terminate in a point, is one two hundred and seventy thousandth part (1-270000th) of the earth's circumference. Taking the equatorial circumference as unity, the error of this aliquot is one part in 736; but if the polar, only one in 3,506, the former error being in defect, the latter in excess, so that there exists somewhere or other on the globe a diametral section whose circumference is exactly 270,000 times the original height of the building. Though not a meridian, it is not very remote from one.

The Ostrich Feathers Badge.

The origin of the ostrich feathers as a badge of the Princes of Wales has been a matter of perplexity to antiquaries. Old Randall Holmes solved the difficulty in his summary way by asserting that they were the blazon on the war-banner of the ancient Britons. The only thing that in any way resembles the triple feathers in ancient British heraldry is to be found on the azure shield of arms of King Roderick Mawr, on which the tails of that monarch's three lions are seen coming between their legs and turning over their backs with the gentle fall of the tips, like the graceful bend of the feathers in the Prince's badge. The feathers themselves, however, do not appear in

connection with Princes of Wales until after the battle in which the blind King of Bohemia—too blind to read a manuscript, yet not so blind but he could see a foe within the swing of a battle-axe—lost his life. The crest of the Bohemian monarch was an eagle's wing. As for the motto of "Ich dien," it was assumed by the Prince to characterise his humility, in accordance with a fashion followed to a late period even by princesses—Elizabeth of York, for instance, took that of "Humble and reverent." Edward of Woodstock, therefore, did not adopt either the badge or the legend of the dead king of Bohemia; such is the conclusion at which nearly all persons who have examined into this difficult question have arrived. Nevertheless many have still faith in the old tradition as far as the badge is concerned. John, Count of Luxemburg, was the original style and title of him who was elected King of Bohemia, and fell so bravely and unnecessarily at Crecy. Now the ostrich feather was a distinction of Luxemburg, and it is from such origin that the Princes of Wales derive the graceful plumes which are their distinguishing badge but not their crest. This much is stated by Sir H. Nicolas in the "Archæologia," and Dr. D'Eyncourt suggests that the King of Bohemia's crest looks more like ostrich feathers than a vulture's wing. The question may be considered as having been set at rest by John de Arden. He was a physician contemporary with the Black Prince; and in a manuscript of his in the Sloane Collection Arden distinctly states that the Prince derived the feathers from the blind king.

Roman Architecture.

In spite of all the wonders of Greek sculpture, we must needs think that the Greeks had done little to fix the future architecture of the world. There was no elasticity or power of growth about the style. Right in its own country, used for the worship and aspirations which first gave it birth, it could not be used for anything else. But with the architecture of the men of the Roman name it was quite different. In the first place, they seized on the great invention of the arch, the most important invention to house-needing men that has been or can be made. They did not invent it themselves, of course, since it was known in ancient Egypt, and apparently not uncommon in brick-building Babylonia; but they were the first who used it otherwise than as an ugly necessity, and in so using it they settled what the architecture of civilisation must henceforward be. Nor was their architecture, stately as it was, any longer fit for nothing but a temple—a holy railing for the shrine or symbol of the god. It was fit for one purpose as for another—church, house, aqueduct, market-place, or castle; nor was it the style of one country or one climate. It would fit itself to north or south, snowstorm or sandstorm alike. Though pedants might make inflexible rules for its practice when it was dead or dying, when it was alive it did not bind itself too strictly to rule, but followed in its constructive part at least the law of nature—in short it was a new art, the great art of civilisation. True it is that what we have been saying of it applies to it as a style of building chiefly; in matters of ornament the arts of the conquered did completely take the conqueror captive, and not till the glory of Rome was waning, and its dominion become a tax-gathering machine, did it even begin to shake off the fetters of Greece; and still, through all those centuries, the Roman lords of the world thought the little timber god's house a holy form, and necessary to be impressed on all stately architecture. It is a matter of course that the part of the architectural ornament of the Romans shared fully in this slavery; it was altered, and somewhat spoiled Greek work, less refined and less forbearing. Great swinging scrolls, mostly formed of the acanthus foliage, not very various or delicate in their growth, mingled with heavy rolling flowers, form the main part of the designs that clove to the arts. There is no mystery in them, and little interest in their growth, though they are rich and handsome; indeed, they scarcely do grow at all—they are rather stuck together; for the real connected pattern, where one member grows naturally and necessarily out of another—where the whole thing is alive, as a real tree or flower is—all this is an invention of what followed Roman art, and is unknown both to the classical and the ancient world. Nevertheless, this invention, when it came, clothed its soul in a body which was chiefly formed of the Greco-Roman ornament, so that this splendid Roman scrollwork, though not very beautiful in itself, is the parent of very beautiful things. It is perhaps in the noble craft of mosaic—which is a special craft of the Roman name—that the foreshadowing of the new art is best seen. In the remains of this art we may note the growing formation of more mysterious and more connected, as well as freer and more naturalistic design; their colour, in spite often of the limitation forced on the workman by simple materials, is skilfully arranged and beautiful, and in short there is a sign in them of the coming of the wave of that great change which was to turn late Roman art, the last of the old, into Byzantine art, the first of the new.

NOTES AND COMMENTS.

IF the painting which Mr. SPENCE has discovered in the Pitti Palace can be proved to be the *Pallas* of BOTTICELLI, which VASARI mentions, the English artist will have accomplished a feat which will make foreign connoisseurs envious. VASARI relates how SANDRO executed several works in the Medici Palace for the elder LORENZO, especially a life-size figure of PALLAS on a shield wreathed with vine branches, from which flames are issuing. The picture escaped notice, which is not surprising, for BOTTICELLI'S style was long out of fashion. If it were considered valuable, it would hardly be allowed to drift into the Pitti Palace. Mr. SPENCE remembered VASARI'S description, although it does not correspond with the painting. He informed Signor RIDOLFI of his conclusions, which were confirmed by that authority. The goddess is represented as a young woman, partly in armour, with white robes over it. In one hand she holds a halberd, with the other she has seized a centaur by the hair, who has dropped his bow and appeals for mercy. The scene is on a plain near the sea. The painting may have an allegorical meaning, and relates to some action of LORENZO'S.

IN the "Account of Some of the Statues, Bas-reliefs, Drawings and Pictures in Italy," by the younger RICHARDSON, which appeared in 1722, he mentions "a range of little pictures" in one of the rooms of the palace of Mantua, and adds, "but the place is so dark that they are hardly visible." Were those pictures the frescoes by CORREGGIO which M. CHARLES YRIARTE claims to have discovered, and which he described on Saturday last before the Académie des Beaux-Arts? At any rate, his examination of them has persuaded the Italian Government to take more interest in the works, and they have been sufficiently cleaned to become visible. If RICHARDSON was not acquainted with them, to him at least the interest in CORREGGIO may be ascribed. No other connoisseur in the eighteenth century would have the courage to relate his sensations on entering a room in Rome in which pictures by CORREGGIO were hung:—"I do protest I never was so surprised, my heart struck against my breast. RAPHAEL is vastly great and sublime, and withal has a grace like that of the best of the ancients. But no master that ever was surprises like CORREGGIO; and yet without an equal measure of greatness, and with a grace not antique, nor like any other master. I cannot conceive or imagine how those expressions can be given that I see before my eyes, when I see at the same time perpetual incorrectnesses; not one of his pictures but has instances of this. CORREGGIO had a grace the pure effect of nature, not antique, nor like that of PARMEGGIANO, GUIDO, RAPHAEL or any other master, but something alone and which seems to be truly angelical." The RICHARDSONS could not be sparing in their praise whenever they admired an artist's work, and CORREGGIO was one of their idols.

IN noticing M. GABILLOT'S book on LEOPOLD ROBERT, we mentioned that the French painter was imprisoned on the recommendation of DAVID. A similar instance of DAVID'S manner of displaying his ill-will towards other artists is mentioned in the first volume of the "Journal of Marshal DE CASTELLANE," which is about to be published. During the Reign of Terror, HOUDON, the sculptor, was arrested through the influence of DAVID. Madame HOUDON at once appealed to BARÈRE to save her husband. The revolutionist was doubtful about the possibility of doing so, but he asked what was the work on which he was engaged, and which was the overt act of treason against the Republic? It was a statue of St. SCOLASTICA, who was represented as a handsome woman with a roll of paper in her hand. Just at that moment COLLOT D'HERBOIS, one of the most cruel and therefore most influential of the Conventionists, entered. BARÈRE informed him that HOUDON had completed a statue of Philosophy meditating upon the Revolution which deserved to be purchased by the Assembly and placed near the hall of meeting, and that the sculptor should be declared to have well served the country by his work. Through the interest of the two men that course was adopted and HOUDON escaped the guillotine. BARÈRE was a rabid

enemy of England, and MACAULAY did not exaggerate when he said of him, "BARÈRE approached nearer than any person mentioned in history and fiction, whether man or devil, to the idea of consummate and universal depravity." It is a little satisfaction to be able to record that a man who sounded all the depths of baseness was capable of doing a kindly action by rescuing one of DAVID'S victims.

THERE is no doubt much disaffection in Strassburg, but the German Government have undoubtedly endeavoured to do justice to the people, and the expenditure on building is unprecedented. A new Strassburg is arising, which from the number of educational buildings in it should become a rival of the famous universities. A few of the items which are under the consideration of the authorities will suggest at what price Strassburg is being made worthy of its position as a part of the empire. On the university buildings an expenditure of over 60,000*l.* will still be required. The new buildings of the Medical School will require a grant of 40,000*l.*, besides one of 8,000*l.* on subsidiary departments. About 1,000*l.* will also be expended on sculpture for one of the medical institutes. Every year a large outlay becomes necessary, and we doubt if it can all be derived from Alsatian revenues. All accounts are duly paid, and there is an immense amount of building to show for the money. The contrast between the young and the old Strassburg in consequence becomes every year more striking.

FROM its geographical position, Dublin would not appear to be a city that could not easily be drained. Although several Royal Commissions have considered the subject, the Liffey continues to be the sole resource. At last, however, an attempt is to be made to remove the main cause of the unhealthiness of Dublin. The Corporation on Monday approved of arrangements for commencing drainage works shortly. Three years ago it was settled that the sewage should be carried to the slob on the south side, near the Pigeon House Fort, and treated by a precipitating process. One obstacle was the probable effect of the works on the troops in the fort. The War Office considered the best course would be to sell the buildings to the Corporation. In 1813 the site of the fort cost 100,183*l.*, and besides 46 acres of land there are barracks, storehouses and other buildings. The Corporation offered 45,000*l.* for the property, but the War Office would not accept less than 65,000*l.*, and eventually it was agreed to pay that sum. The possession of the fort will enable the precipitating works to be constructed somewhat nearer to the city than was originally proposed, and there will be no necessity for any interference by the military authorities. Besides, the grounds and buildings can be utilised for several purposes. The cost of the drainage works is estimated at 302,000*l.* It is proposed to advertise for tenders as soon as possible, and the intercepting sewer will be first undertaken.

IF all Frenchmen resembled M. LACROIX, of Hastings, they would not be desirable clients for English architects. That gentleman, who was described as a man of means and position, availed himself of the services of Messrs. GANT & SLATTER, architects, when he decided on additions to his house. But his imagination produced visions of collusion between architects and builder. The work done, of course, appeared unsatisfactory and more costly than was equitable. The architects were compelled to recover their fees in the County Court. M. LACROIX then began a course of persecution of the senior of the firm. He wrote to various people in the district making charges against Mr. GANT, for which an action was taken that was concluded on Monday. M. LACROIX acted as his own counsel, and said that instead of paying he wanted 1,015*l.* as damages. The plaintiffs' counsel offered to discontinue the action if M. LACROIX would submit to an injunction, but the defendant would not agree. The manner of M. LACROIX was not likely to impress a jury favourably, and Mr. Justice HAWKINS was compelled to warn them that in their anger they must be careful about awarding damages that were too heavy. A sum of 250*l.* was given and an injunction was granted to restrain the defendant from repeating the libels.



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INX. PHOTO. SPIAGUE & CO. 4 & 5 EAST HARDING STREET, FETTER LANE.

OF THE STAIRCASE.
& THOMAS, Architects.



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FIRE-PLACE IN DINING ROOM,
T. G. ABERR
Messrs. WYLIE & LO-



INK-PHOTO. SPRAGUE & CO 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

"ARLING HALL," LARGS, N.B.

Architect.

LIMITED, Decorators.

ILLUSTRATIONS.

ELY COURT ST. CARDIFF.

ELY COURT, CAR. FF.—THE STAIRCASE.

FIREPLACE IN DINING-ROOM, CURLING HALL, LARGS, N.B.

SOCIETY OF ARCHITECTS.

THE fortnightly meeting of this Society took place on Tuesday evening, Mr. G. Highton, president, in the chair.

A paper, which was illustrated by numerous diagrams and plans exhibited on the walls, was read by Mr. R. Barry Parker, of Buxton, entitled

Some Principles Underlying Domestic Architecture.

Mr. PARKER, in the course of his address, said:—My appearance before you to-night is, I judge, somewhat the result of a conversation which I had with a member of this Society a few weeks ago respecting the lack of unity almost universally evident in our houses, and I suppose it is what I have to say as to the lines on which alone any mitigation of this fault is to be hoped for that you wish to hear from me to-night. I cannot but feel gratified that the Society of Architects should accord me this opportunity of laying before them the conclusions that my special training has caused me to arrive at; you will, I hope, pardon any seeming egotism in the way in which I shall do this, bearing in mind the necessarily definite position a lecturer must assume. In the class of house with which we are to deal to-night, there are so many directions in which improvement is needed, that it will only be possible for me, in the space of one lecture, to refer to a few of them, and to those specially which will illustrate most suggestively the main principles for which I contend. Suggestively, in the hope that some present will do me the honour to give further thought to what I shall touch upon, beyond what is possible to them during the length of time assigned to me this evening. The influences which our common everyday surroundings have upon our characters, our conceptions, our habits of thought and conduct, are often very much underrated; we do not realise the power they have of either aiding or hindering the development in us of the best or worst of which we are capable. Of the capacity the mere contour of a moulding has to bear the impression of refinement or vulgarity, we, as architects, are fully aware, but I think may not quite as fully realise the harmful influence of imperfect and unspontaneous drawing, or ill-conception in pattern, design, or ill-assorted combinations of colour; and perhaps the influence is none the less hurtful, in that it is often comparatively unconsciously operative on the recipient.

The thing of first consideration in designing a house is convenience, workability. The plan is that which should be first thought of, and in our small middle-class house one or two improvements seem to be wanted in planning. First of all, the most comfortable form of room for a sitting-room with respect to the relative positions of the door, windows and fire. The second best arrangement (when this cannot be got) is to have the door and fire both on the long wall. When the door is on the opposite wall to the fire you never feel to be able to get out of the draught of it, and of course this kind of thing is too palpably bad to need that anything should be said regarding it.

Well, here are four plans laid down on the lines usually adopted for this class of house. What are the chief defects? Are they not these? Too many rooms, and all therefore necessarily too small. In the larger middle-class house there are generally drawing-room, dining-room, library, kitchens and offices, all tolerably good rooms. Now, when a smaller house is wanted, the general custom seems to be to put exactly the same number of rooms, only reducing all in size. Would it not be far better to reduce the number of rooms, keeping such rooms as we do retain large enough to be healthy, comfortable and inhabitable?

Are not many of the houses we all know only too well most distressing in this respect, divided up as they are into a number of small compartments (we cannot call them rooms), all far too small to be healthy, too small to be really fit for human habitation. And what is gained by this cramping? Generally only that there are one or two of these compartments which are practically no good to anyone; in far the greater number of these houses the third room even is never used, or only used for the sake of it, and its chief advantage seems to be it is somewhere for the women of the household to put in any spare time they may have, cleaning down, dusting, &c.

Now many people have a feeling that there is a certain

cosiness in a small room entirely unattainable in a large one; this is a mistake altogether. Quite the reverse has been my experience, which is that such a sense of cosiness as can be got in the recesses of a large room, can never be reached in a small one, be it no larger than a sentry-box. But if your big room is to be comfortable it must have recesses.

There is a great charm in a room broken up in plan, when that slight feeling of mystery is given to it which arises when you cannot see the whole room from any one point in which you are likely to sit, when there is always something round the corner.

And what is made of the hall? Generally one of two things; either it is a passage with a kind of stepladder for a staircase and a hat-stand in it, with not room enough for you to hold the door and let a friend out, or it is a great bare, cold, comfortless waste space in the centre of the house, instead of being (as it might) the most comfortable and homely room, the centre of the common life of the household.

Of course a hall of this kind needs some care in planning. In the first place the staircase must occupy exactly that position in which it can be made an ornament and a pleasing feature in the room (all of which it is quite capable of being), and a position in which it does not detract from the cosiness or give any unpleasant feeling of draughtiness, or too great openness. In the second place the doors, necessarily opening into a hall, must be carefully so grouped that the parts of the room in which anyone would sit, should be out of the draught of them as far as possible.

In any house, all through the winter months, unless a fire of some kind is kept burning in the hall, the whole house is cold; most people find it necessary to have a stove or something, and in most houses it is thought necessary to have two other fires burning, that there may be somewhere to show visitors. Now, when the hall is also a sitting-room, we get for the trouble and expense of two fires all the advantages ordinarily attaching to three.

Here are three ground plans somewhat on these lines, but I want specially to call your attention to this:—Here, you see, we have a large hall, which is the principal sitting-room, one other good large room, kitchen, scullery and pantry on the ground floor. Just contrast, for a moment, the difference in appearance between these two halls: the one a comfortable room with a bright open fire burning, and the other, the ordinary hall, with a tile floor and a stove or the cramped passage.

I must now pass on to decoration and furniture. The best test of the artistic merits or demerits of a room, as a whole, is the impression it makes on one's entering for the first time. We can get accustomed to anything, and it is from this fact, taken in conjunction with what we have already noted of the power as an influence for advancement or degradation of beautiful or unbeautiful surroundings, that the importance of our subject to-night is partly drawn.

And what should be our feeling on entering a room? Simply this—How exquisitely comfortable! For the first essential in the form and design of any decorative object (and everything in a room should be a decorative object) is reposefulness.

I feel herein to be guilty of giving utterance to a truism, and I should hardly dare to state so obvious a fact were it not that I see this first principle so almost universally violated; for, if this test of reposefulness is the test, the average farmhouse kitchen has an artistic value far beyond that of ninety-nine out of every hundred drawing-rooms in the kingdom, and I will endeavour to show why. The first fault in our rooms which contributes to this end is over-decoration.

This is an almost universal failing. Everything has a pattern on it, and almost every pattern is mechanically produced, run out by the yard, and cut off just where it happens to be when the time comes for it to finish. No pattern bears any earthly relation to any other pattern, and the whole effect is fidgety, fussy and painful to a degree. Nothing is let alone, but every surface must needs be worried and tortured into some unwholesome form of mechanically produced and altogether soulless ornament. We cannot even find rest for our weary eyes on the ceiling, for tortuous intricacies of design meet them here also. Even this may be better than the staring white of old days, but that staring white had, at any rate, a very good excuse for its existence from utilitarian considerations. And observe (and this is the second fault I wish to refer to), all this ornament is made to shout, everything is clamouring for notice.

It would not be in place for me to say much here about those rooms in which any one element of decoration is in such flagrantly bad taste as to be noticed immediately on entering with a sort of start and feeling of "Oh, wall-paper!" or "Oh, carpet!" or whatever it may happen to be. (A designer will often aim at this for the sake of the advertisement, and at the sacrifice of his artistic principles.) But even when this extreme is not reached, everything seems trying (within certain limits) to assert itself, to attract attention.

Now any ornament you notice when you do not look for it,

or perhaps I might better say, when you do not wish to think of it, is necessarily in bad taste. The degree of assertiveness admissible in a decorative object is in direct ratio to the degree of its conventionalisation or naturalisation, or, to put it another way, to the degree in which it is fine or mechanical. For instance, we cannot pretend to regulate by rules of this kind pictures which are direct mirrors as far as possible of real things, though in so far as they claim to be mural decorations they come under this law.

Mr. Ruskin's wall, painted to look like a vinery, would admit of much more forcible treatment, being entirely painted by hand, and as true to nature as possible, than would a wall with a printed vine pattern on it, in which there necessarily was repetition. And natural flowers painted on the panel of a cabinet may fittingly be treated much more forcibly than would be admissible in a purely conventional design in a similar position, because natural flowers, hills and trees, cannot become assertive enough to influence one disquietingly; it is only when man's agency is called in that this element is introduced.

Therefore the more nearly approaching to nature the more assertive may be our ornament, or rather the less assertive it will be from this very reason, and therefore may be the more forcible in treatment. So we can stand in a conventional pattern design a degree of contrast in tones which we could not in a mere plaid or check, and in a plaid or check contrasts of tone which we could not tolerate in flat masses of colour. One of the chief underlying causes of this failing of fussiness we have noted is that a room is scarcely ever designed as a whole, never enough thought of as a whole.

The designer of each individual thing, knowing nothing of the form, or character of anything else in the room was going to take, thought only of his own design and worked enough interest into it to make it all-sufficient in itself, and the consequence (when his design gets put into a room in conjunction with a lot of other things, all designed in just the same spirit) is that restlessness, fussiness and fretfulness we have been deploring.

A room is a place in which to think of other things besides those relating exclusively to the room itself, and so much incident and interest should not be worked into it as to distractingly affect the pursuance of these thoughts and occupations. I say again, any ornament which you notice when you do not wish, is necessarily in bad taste. When choosing anything (a wall paper for instance), we forget that we are, while so doing, devoting all our thought and attention to the design we are considering, and that though pleasing under these circumstances, it may not be equally so to have by us when we wish to think of other things, or in the position for which we intend it.

Now no flat mechanical ornament designed to cover a large space should ever be so designed that you are able easily to trace the pattern at the other side of the room. Please do not understand from this that it should be small in design; far from it; things small in design are almost necessarily finikin, and therefore unreposeful, but being quiet and retiring in colour and contrast of tones, whether large or small, let it reveal (when you come to have leisure to examine it) vigorous broad and direct treatment, good, loving, thoughtful drawing, and real artistic conception and perception of beauty in form and line. How seldom we get these qualities, these examples, selected at random, will do something to illustrate. How laboured and unspontaneous they are, almost without exception, into what unwholesome forms the ornament is tortured, how the whole aim seems to be to make the design as restless and fussy as possible; a sort of feeling pervades the whole that the designer could not let the thing alone.

Here is one of the finest designs for a wall paper in the market; it is by Lewis F. Day. Here is this design, with a little spray running in among the main design. Could I have a better example of what I am endeavouring to show? Does not the spray largely destroy the repose of the whole, making it at once in some degree fussy? Of course Mr. Day, with his usual consummate skill, has introduced this additional interest in the way least calculated to destroy the unity. He did not, as many would have done, introduce some large flower form occurring at awkward intervals, thereby destroying the rhythm of the design; but still I think you will all feel with me that the introduction of this spray is only injurious to the whole composition.

I think we must not now go far into the faults in actual draughtsmanship most common in our designs. One thing is very striking, and this is, that almost without exception our designers seem out of their depth directly anything in the way of foreshortening is required of them; this cannot but lead us to the conclusion that drawing from nature does not form a sufficiently important part of their training; in fact I have myself known several men engaged entirely in drawing ornament who never drew a bud or twig from nature in their lives. However this may be, the fact remains that very few of our designers seem able to draw a leaf turning over with any truth or accuracy.

Another cause of failure in our rooms is the dread of repeating ourselves. With my wish that a more wholesome feeling in this may spring up among all engaged in artistic work, I am perhaps more anxious to have your sympathy than with anything which has gone before.

Let us, then, do nothing different from what we have done before until we feel it to be better than what we have done before.

Now this is no imaginary evil, but a very real and living one. How often do we all do something fresh, knowing it to be not the best we can do (best I mean more in kind than degree), simply from a weak dislike that people should say of us "He can only do this one thing." How often do we turn out a design for a certain purpose and position, knowing it to be not so good as one we have before done for a similar purpose and position, simply because we have not strength to do the best we can do, fearing people should think that is all we can do. In so doing we preclude all possibility of progress. Now observe this never occurs during the progress of any living act in the past. The man who had carved one Early English capital did not, when next he had a capital to carve, say, "I know nothing more beautiful, but I must at any rate do something different; I must not put the same capital here again." On the contrary, his aim was to carve the same capital again, only he saw some little point in which he could improve on the last he did, some way in which he could mass his light and shade so as to give them a more pleasing form when seen at a distance, or some more lovely feeling he saw it possible to introduce into the reveal of a leaf or the curve of a stem.

You must forgive me if I dwell on this a little, as with all of us who have any hope or wish to see a living art again existent among us, that we should realise the full significance of this is of vital importance. There are many other changes which must take place in our practice of the arts, and these very radical changes, before living art is again possible to us, but if I can bring home to any one, directly or indirectly, the full significance of this, I shall have done something towards this great end.

The reply many would make to this is:—"This aiming at change, variety, novelty, &c, is demanded of the designer by a capricious, change-loving public, broadly speaking, incapable of any true judgment or appreciation of good and bad in art."

In reply to this I think we cannot do better than call to recollection what Mr. Ruskin says on this head. "You may like making money exceedingly, but if it come to a fair question whether you are to make 500% less by this business or to spoil your building, and you choose to spoil your building, there is an end of you. So you may be as thirsty for fame as a cricket is for cream, but if it come to a fair question, whether you are to please the mob or do the thing as you know it ought to be done, and you can't do both and choose to please the mob, it's all over with you, there's no hope for you; nothing that you can do will ever be worth a man's glance as he passes by."

The fourth cause of failure in decorating and furnishing is virtually the same as we noticed when speaking of planning. When a small middle-class house was wanted, what was usually done, we saw, was virtually to take a plan suitable for a larger house and reduce it every way, instead of designing a house suited to the new requirements. This same mistake is generally made in the decoration and furniture; instead of these being designed to suit the conditions of circumstances in which they are to be placed, each designed for its position and purpose, and good and honest as far as it goes, what do we find? Cheapened imitations of the sort of thing found in the larger house, cheapened by being badly made, by cast ornament instead of wrought, by veneer on pine instead of solid wood, by cast metals made to look like wrought, by machine-carved wood, by marbled slate, &c.

And now for the fifth and the last cause of the failure of which I shall speak, and this is, the very marked feeling which everything has of not having been designed for its place, the look everything has of being ready to move at any moment. Most things to look right and happy in their places must be designed for their places. The advantages attaching to a room furnished in this way and largely by means of fixtures, I think the accompanying sketches will do something to illustrate. Here are the two views again of the hall in the house of which we saw the plan and elevations a while ago.

There is a unity, completeness, comfort and repose about such a room which can never be got in a room in which the furniture, &c., is not designed for its positions and looking at home in its positions and not just temporarily stuck where it happens to stand, with a look of being on the alert and ready to move on at a moment's notice. This design for a drawing-room is by no means bad, it is at any rate a long way above the average, but it illustrates what we are noticing.

But it is time to sum up our position and note the general conclusions to which we are led. I have described some of the defects we most commonly see in planning and the arrange

ment of the hall, the entire want of reposefulness (that infallible criterion of good ornament) that troubles the man of taste in nearly all domestic decorative work, and the lack of fitness in the furniture that is generally crowded into the rooms of smaller middle-class houses, which adds the final touches to the complete failure, from an artistic point of view, of the great majority of such rooms.

I further mentioned as causes generally contributing to this failure, over-decoration, the covering of all surfaces with a mass of incongruous patterns quite fatal, even where the designs are in themselves good. The effortfulness of most ornament by which every pattern seems to clamour for notice, in which connection I stated as a guiding principle that any ornament you notice before you look for it, is likely to be in bad taste. Further, I noticed the laboured and unspontaneous character of so many of the designs themselves and the lack of good drawing in them, and hinted that this arose partly from the designer's dread of repeating himself and his eagerness to produce something fresh without considering whether it was better. Finally, I drew attention to the way in which so many rooms are furnished with cheap imitations of better (or more esteemed) materials, decorated with cast or otherwise mechanically produced imitations of hand-wrought ornament, and the general unfitness and ready-to-move look which results from there being no fixed furniture, but all having been designed without any thought of the room, and the room planned without any view to its furniture.

I have several times hinted that the entire lack of unity, which is the inevitable result of all this, must continue so long as our rooms and our houses are never thought out as a whole, so long as one man plans the building, another arranges the decorations, and a third picks up the furniture of twenty designers here and there and everywhere. It is essential to any good result that one man should design the house as a whole. I do not mean necessarily that he should design everything in it, or draw with his own hand every detail; but he must exercise a controlling power, selecting where he does not design, and insuring that the work of all may be done in a spirit of co-operation towards the complete whole which he planned.

You will all be wishing to ask me, I doubt not, how this is possible in our days of speculative building, short leases and shorter tenancies. I must at once admit that to a large part of this work such a system is inapplicable, though even here much could be done if each department made what improvements are possible, irrespective of the others. The lack of power to control the decorations does not excuse a badly planned hall. But outside the purely speculative building there is yet a large amount of work to which the system is applicable, in greater or less degree, such degree mainly depending on our clients, and here we have the real difficulty. We are powerless to compel our clients, nay, to a large extent, the client has a right to have his own way.

I suppose a doctor is in a similar fix. He is called in to prescribe for a patient, and finds his prescription is useless because the patient will continue to smoke. He does not (if he is worth anything) accept the situation, but he explains that smoking is in this case fatal; that it renders all his skill unavailing, and if all his advice is neglected, he will finally refuse to act.

Architecture is rightly called a profession only when the architect advises his client what is best, and brings the whole weight of his knowledge and experience to persuade him from anything foolish or in bad taste. When he produces to order some plan of which he cannot approve, he is merely a merchant of plans.

While speaking of this duty of the architect's, I would not be thought to make light of many conditions of modern life, which will so long as they continue, and to the extent to which they spread, hinder all attempts to produce beautiful and dignified homes. One such condition is the instability of social position; everyone is seeking to get a step further up the social ladder. The result is a demand for houses which look as though they belonged to the next social grade above that of the people who are to live in them. To such untrue aims art refuses any countenance, and it is well.

But there is an already great, and daily increasing, number of those who are weary of this fruitless struggle of a life spent in work entirely without interest or beauty, or the power of giving a vestige of real pleasure, that they may have the means to acquire things without interest, beauty, or the power of giving any pleasure, beyond the sordid satisfaction of letting Mr. and Mrs. So-and-so see they can afford to have them. These are anxious to find houses suited to their genuine wants, simpler even, in many cases, than the one I have shown you, houses in which the work will be reduced to a minimum, and the beauty increased to a maximum, by the only true method of making all the useful and necessary things beautiful, not by the false method of keeping all useful and necessary things out of sight, trying to conceal their purpose, or to appear unconscious of their existence and substituting for them things recognised to

be useless, but regarded (so long as the fashion lasts, at any rate) as beautiful.

This polished mahogany life of ours, with stucco trimmings and jerry joints presented for view to our visitors and acquaintances in the front room, is not, I believe, what many of us really want; we are tired also of the dismal and cramped, but at any rate real, back office, back room and kitchen life, and many are looking for houses and for architects who will design them houses in which they shall not spend their labour for that which is not bread, but shall be able to live a life of less artificiality than our present complex nineteenth-century existence, a truer healthier life altogether.

I have just said that the true method of making a room beautiful is to make all the necessary and useful things in it beautiful; so much is this true that it becomes almost impossible to design a really beautiful room that is to have no useful work done in it and natural life lived in it. An architect called upon to design a room in which nothing more earnest is to be done than to gossip over afternoon tea, has indeed a sad job. For a room must always derive its dignity or meanness, and reflect somewhat the character and kind of occupation which is carried on in it.

For instance, the studio of an artist, the study of a man of letters, the workshop of a carpenter, or the kitchen of a farmhouse, each in its position and degree, derives a dignity and interest from the work done in it. And the things in the room bear some relation to that work, and will be the furniture and surroundings natural to it, as the bench and tools in the carpenter's shop, the easels and canvases in the studio, and the books and papers in the study, and the bright pans and crockery in the kitchen. All these lend an interest and a sense of active, useful human life to the room which redeem it from vulgarity, though it be the simplest possible, and no amount of decoration or ornamentation can give dignity or homeliness to a room which is used as a showroom, or in which no regular useful life is lived.

For in the work-room all things have a place by reason of their usefulness, which gives a sense of fitness and repose entirely wanting in a room where a place has obviously had to be found for everything, as in a drawing-room. How far things, beautiful alone, are to be allowed place in our rooms I am not prepared to say.

Thoreau, you will remember, threw away the fossil, the only ornament in his room, because it required dusting. While not suggesting that we should follow his example to such an extreme, I yet think that in retaining his spade and his axe he retained more of true decoration. And I believe in the main that the more adapted to its use anything is, the more graceful will it be in shape. The bent handle of the axe, more comfortable to hold, is also more beautiful than the straight, and in the degree the curve and form of the handle is adapted to its uses as an axe, by just so much the more beautiful it becomes.

The charm of the farmhouse kitchen, with everything in its place because of its usefulness, can of course be increased to an unlimited extent by making all the useful articles also beautiful in form and harmonious in colour. This is the line on which alone, I contend, a really beautiful room is to be got, and I would discourage all attempts at adornment by finding places for useless things.

I am glad to think that, owing to the great increase of education and employment among ladies, there will be less and less call for the old-fashioned drawing-room; ladies will want a room to work in, not to dawdle in.

Pardon me if I seem to have dwelt over long on some of these difficulties in the way of designing really beautiful rooms. I have done so in the belief that they do not, as at first may appear, lie outside our province. For I believe, as professional men, we have just such power of influencing our clients, by helping them towards a more natural life, as the doctor has in such matters as diet; and particularly is this power evident in the domestic branch of the profession with which we are dealing.

In building a man's shell for him we certainly can influence very largely the life he will live within it; and while it is our duty to make that shell fit the life as well as possible, it is surely also our privilege to make it conduce to the realisation of the best of which he is capable.

In so far as we do this, we shall rise above the mere planner of houses, and take our places in the work of planning and moulding the future life of the people.

A vote of thanks, proposed by Mr. G. A. Middleton and seconded by Mr. S. Marsland, was passed by acclamation to Mr. Parker.

Mr. Grainger Helton has been asked to complete plans for the restoration of St. John's Church, Perth, showing alternatively the throwing of the east and middle churches into one, and the improvement of the middle church on the footing of the churches remaining separate.

CHRISTIANITY IN CHESHIRE.*

THE district embraced within the diocese of Chester, as formed by Henry VIII., was occupied at the time of the Roman invasion by two distinct Celtic tribes—the Cornavii, who were settled in the present Cheshire, and a much more numerous and powerful people, the Brigantes, who held Lancashire, Westmorland and Cumberland, as well as a considerable portion of Yorkshire. Their religion was of the polytheistic type, with an admixture of Druidism; but no other traces remain of their worship than an occasional *maenhir* or long stone (which has been subsequently, in all probability, converted into a Christian emblem), some cup and circular markings, and a few local names such as Belisama (the name of the Ribble), and Aerven, the Goddess of War (an early name for the Dee). The Roman remains which have been discovered from time to time at Chester, Manchester and other military stations in this district afford no indications of the prevalence of Christianity. None of the inscriptions on the tombstones of the legionaries bear the record of any Christian hope. Many of these inscriptions preserve touching reference to the deep affection subsisting between wife and husband, mother and child, master and slave; but all are dedicated *dis manibus* to “the Gods of the shades.” The altars, of which no less than twelve have been found at Chester, are inscribed with names either (1) of the deities of Roman mythology—Jupiter, Optimus Maximus, Tanarus, a Welsh form of Tonans, the thunderer, Mars Conservator, Minerva, Esculapius, the genius of the place, or of the Emperor, the nymphs and fountains—or (2) they are dedicated to the *Deæ matres*, to whom several altars have been found in Belgic Gaul and along the banks of the Rhine. I am not forgetting the so-called ecclesiastical stone, which I believe to be that of a Roman matron and her attendant. There are in the Chester Museum two or three relics of Mithraic worship, but no dedications, as at Carlisle, to those gods with strange uncouth names, supposed to be the deities worshipped by the Brythonic Celts, such as Belatin castor (which recalls the Phœnician Baal), Maponus, Setlocenia, Coventina (goddess of memory), and the like. It is not, however, to be assumed that the Christian faith was not taught in Cheshire and Lancashire during the period of the Roman occupation. The two legions (20th and 2nd pia adjutrix) which, like Roman soldiers in other parts of the empire, were important heralds of the Prince of Peace, must have had among them more than one who had some knowledge of the Gospel message. But it is more than doubtful whether this saving knowledge radiated to any distance beyond the military stations.

The villas and other remains which have been discovered are usually close to the great centres of population, showing that the Romans made no attempt to spread their influence outside a certain area. The rest of the land—often a dreary succession of fen and morass, varied with long tracts of unreclaimed forest—was left to the older inhabitants, who for the most part would keep aloof from the Roman camp and the great highways, and did not therefore come under Roman influence, whether for ordinary civilisation or for religious teaching. There must, however, have been exceptions to this. It happened not infrequently, if we may judge from sepulchral inscriptions, that the legionary soldiers intermarried with the natives, and on the completion of their term of service settled down permanently on the lands assigned them. Whether this leavening had a Christian tendency cannot be ascertained. It is worth notice in this connection that the tonsure, which was one of the points of difference between the Celtic and the Roman Church, as practised in Britain and Ireland, is said to be a survival of a Druidic fashion.

We must pass over a long interval of years after the final withdrawal of the 20th Legion from Chester (about 410 A.D.), before we come to any definite statement in connection with the religious condition of the district. Alleluia victory of Germanus, near Mold, occurred in 430 A.D., and must have borne some fruit at least in the neighbourhood of Chester, if not throughout the district. In the story of the struggle between the Britons and the Saxons under Æthelfrith, which culminated in the so-called Battle of Chester in 613, the monks of Bangor Monachorum or Iscoed play an important part. This place, now a small village on the borders of Cheshire and Shropshire, called by Bede Bancornberg, is identified by some writers with Bovium, a station on the great Roman road between Chester and Wroxeter. The names of three of its gates are still preserved—Porth Hwgan on the north-west, Porth Clais on the south, and High on the east. (E. Llwyd, writing 1699, says the fourth gate was in Dwngre.) A monastic establishment of some importance was in existence here before the arrival of the Italian Mission under Augustine (A.D. 596).

A tradition declares that Pelagius (Morgan, the sea-born), who was born A.D. 350, belonged to this house. The community must have been in a flourishing condition to have been able to send a detachment to Bangor Vawr, in Carnarvonshire, in 516, as well as another four years later to Bangor, in Ireland. It was the last Abbot Dunaud, or Dinnoth, who, with seven British bishops, met Augustine in conference, and, with the traditional spirit of independence, refused to accept his supremacy or adopt his suggestions. Augustine, angered at the repulse, retorted that if they would not preach the gospel to the Saxons as brethren, they must not be surprised if they were slain by them as enemies—words which, in the light of subsequent events, were regarded as a prophecy, some even going so far as to suggest that Æthelfrith, of Northumbria, was instigated by Augustine, in revenge, to attack the monks. At that time this monastery was one of the largest in Britain, consisting (according to Bede, who lived in the century that witnessed the destruction of the monastery) of at least 2,100 monks, that is, seven bodies of 300 each. Bede relates how on the advance of Æthelfrith upon Chester in 613, the monks of Bangor, anxious for the success of their fellow-countrymen, after a three days' fast sent forth 1,200 of their brethren, who made their way to the battle-field and there offered up prayers for victory to their nation. Æthelfrith watched the wild gestures of the monks as they stood apart from the host with arms outstretched in prayer, and bade his men attack them first of all. “Bear they arms or no,” said the king, “they fight against us when they cry against us to their God.” The slaughter was so complete that only fifty escaped, the Welsh chieftain Brochmael, who had undertaken to protect them, having basely deserted them. This has been called the Battle of Chester, and it is stated by more than one writer that the massacre of the monks took place under the walls of Chester. But it is more probable that the scene of the tragedy should be placed nearer to the monastery at Caergwile, or, with still greater probability, at Holt, which position on the Dee opposite Farndon bears in documents as late as the Elizabethan period the alternative name of *Castrum Leonum* (castle of lions), the seal bearing a lion rampant. Local names along what would be the line of march between Bangor and Chester still preserve the memory of a terrible disaster to the British arms. Among these may be mentioned *Maes yr Ing*, the “Field of Agony,” near Worthenbury, and *Bryn Yockin* (*yr ochain*, the “Hill of Groaning”), near Rossett. The faith of Woden and Thor might appear for the time to have triumphed over the religion of the Crucified One. The heathen Saxon might have had some apparent justification for taunting the British Christians with the derisive question, “Where is now thy God?”

The great monastery was rased to the ground. This would be no great task, for the monastic buildings of the Celtic Christians were of the simplest possible character, no such elaborate structures as William of Malmesbury, who confounds it with Bangor in Carnarvonshire, evolves apparently out of his own imagination. He says:—“No place could show greater remains of half-demolished churches and multitude of other ruins.” In fact it was simply constructed of wattle-work, *i.e.* osiers interwoven and plastered over, and leaving but little trace of their destruction. But the spiritual influence of the faithful occupants of this monastery did not pass away with the destruction of their corporate home. It extended to other and far distant districts. Not only had they sent forth a number of brethren to settle in Bangor or Benchor in Ireland, but Deiniol Wyn, the son of Dunawd, the last abbot of Bangor-is-Coed, founded a church at Hawarden still dedicated to him (St. Deiniols), and established a monastery at Bangor Vawr in Carnarvonshire, and later was appointed by the British king, Maelgwn Gwynedd, the first Bishop of Bangor. It was Eurgain, the saintly daughter of this same Maelgwn Gwynedd, who founded the church of Northop, a few miles from Hawarden, which preserves in its Welsh form the name of the foundress, *Llaneurgain*, and we cannot doubt that holy men and women would endeavour to make their influence felt at so important a centre as Chester. The British Christians have been censured for their refusal to take their part with Augustine in preaching the Gospel to the heathen Saxons. It must be remembered that the Britons were engaged in a life and death struggle with the Saxon invaders for the possession of their native land, and that they were being thrust further and further back into the corners of the island. Such a time of bitter anguish and hard fighting was certainly not favourable for the preaching and hearing of the gospel of peace as regards either the conquering or the conquered race. But, as we have seen, the British Christians did not neglect the duty of evangelisation in the districts which still remained to them.

It has been suggested that Christianity was first preached to Britons in the peninsula of the Wirral by Cyndeyrn or Kentigern in 560, about the time when, passing from Strathclyde, on the coast of Lancashire, to North Wales, he founded the monastery at Llanelwy or St. Asaph, and that the holy man he left there as its first bishop in 573, St. Asaph, tended the infant

* A paper by the Rev. Canon Morris, D.D., read at the fourth meeting of the session of the Chester and North Wales Archæological and Historic Society, and published in the *Cheshire Observer*.

church in Wirral. If this very probable suggestion is accepted it establishes one more bond of union between the Church of England in England and Wales. The same writer goes on to show that after the Battle of Chester in 613, the British remnant left in Wirral remained Christian, but hated by the English, and hating in return, made no attempt to convert their conquerors. The later conversion of the English is to be attributed to St. Aidan or St. Chad. The work was not left entirely, however, to ecclesiastics. It is remarkable that hardly forty years after the light of Christian truth had been apparently extinguished by Æthelfrith's destruction of the monastery at Bangor-Iscoed, Penda, "the strong," the impersonation of the power of heathendom in middle England, before whom the saintly Oswald and four other kings had fallen, was to find his own daughter and one of his sons allied to those who professed the faith he so bitterly opposed, while another son, Wulfhere, and his granddaughter, Werburga, were to have their names associated to all time with the evangelisation of Mercia, as royal nursing father and nursing mother of the Church in that important district. The story of their work and of Oswald, the Christian son of the heathen Æthelfrith, has been told elsewhere.

There only remains to be added some details specially relating to Cheshire and Lancashire. Some at least of the early Christian monuments which have been found in these counties bear silent testimony to the great religious revival which went on there in the seventh century. The greater number of the crosses and monuments cannot be earlier than the ninth century, some belonging to the eleventh century. And it is doubtful whether the local tradition about the Sandbach crosses, that they were erected to commemorate the conversion of Penda, Penda's son, to Christianity in 653, is to be accepted unhesitatingly. Whether these Sandbach crosses belong to this early date or are to be referred to the next century, they preserve a most interesting group of Christian subjects, probably the finest in all England. The several panels include the following scenes:—The crucifixion, with the sun and the moon above and St. Mary and St. John below, surrounded by the symbols of the four evangelists; the Nativity, with the ox and the ass kneeling before the holy child in the manger cradle; the Virgin enthroned, holding the holy child, with a saint on either side and the holy dove above; Christ in glory, with an angel on the left and St. Peter carrying the key on the right; Christ led bound before Pilate; Christ carrying the cross. Another important cross, much weathered, at Halton, in Lancashire, curiously illustrates the existence at the time of Paganism side by side with Christianity. On the east and north faces are scenes from the Scandinavian mythology, representing Sigurd roasting the heart of the dragon Fafni on a spit, his horse Grani returning home riderless after his master's death; Regin, the dwarf smith, working at his forge. On the opposite face among other Christian subjects is to be seen Christ enthroned, with two smaller figures clasping his feet. It is one more instance, I believe, of the appropriation by Christians of heathen monuments. Again, the sculpture on the cross at Winwick in Lancashire has been supposed by competent authorities (Canon Browne) to refer to St. Oswald, to whom the church at Winwick is dedicated, one panel representing his dismemberment after his defeat by Penda, while the other shows water being carried from St. Oswald's Well, which is a short distance from the church. The rest of the early Christian monuments in Cheshire and Lancashire found at Neston, Bromborough, Hilbre, West Kirby, Overchurch, in the Wirral peninsula; Chester, Macclesfield, Lyme Park, in Cheshire; Bolton, Heysham, Whalley and Lancaster, in Lancashire, are of much later date.

No remains exist of any Saxon churches in these counties. The earlier churches were certainly built of wood or wattle. Stow, in his survey of land, has made a curious slip in speaking of the Wirral. "These Saxons were likewise ignorant of building with stone till the year 680, for then it is affirmed that Benet, abbot of Wirral, master to the Venerable Bede, first brought artificers of stone houses and glass windows into this island amongst the Saxons, arts before that time to them unknown, and therefore used they but wooden buildings." Stow is referring to Benedict Biscop, who was of Wearmouth, not of Wirral. However other parts of Cheshire may have fared, it is certain that the Wirral peninsula suffered most severely from the invasion of the Northmen, an invasion the memory of which abides in the Norse names, preserved so markedly here as compared with the neighbouring districts. While the Christianising influence of the British settlers has left no other trace than such names as Landican, Poulton, Lancelyn, the numerous villages with the termination "by" point to the Norse immigration. Such are Whitby, Kirkby, Frankby, Greasby, Pensby and Irby. Not more than 300 years had elapsed after the triumph of the Saxons when the Saxons themselves had to suffer in turn the miseries they had inflicted on the Britons—to see their fair fields ravaged, their towns sacked and burnt, their churches and monasteries ruth-

lessly destroyed. It was in 1000 that King Ethelred's fleet mustered at Chester, and thence proceeded against the Viking rovers, who were sweeping the western waters and carrying off their valuable spoils from the mainland. And it was most probably a little before that time that the wave of heathenism swept over Wirral. But the Norsemen did not long remain in heathen darkness. They submitted to learn the religion of the English, and hence with Thurstanton, which recalls the name of the god Thor, we find also West Kirby, as well as Kirby-in-Wallasey. In the Litany of the period we are discussing, one of the suffrages was, "Deliver us, O Lord, from the terror of the Northmen." The terror of these Northmen had at an early period, in 875, forced the nuns to transfer the revered body of St. Werburgh from Hanbury to the safe keeping of Chester. But Chester itself suffered later from these ruthless invaders, and the nunnery, which had been founded to watch over the sainted remains, after unhappy experiences, was re-edified by Ethelfleda, the "Lady of the Mercians," for secular canons, and later endowed more amply by King Edgar, who, by a charter dated 958, granted to it certain lands. A century later, 1057, the buildings were extensively repaired by Leofric, of Mercia, who bestowed upon the community additional privileges.

When Domesday was compiled, the canons are stated to hold, besides hides in several hundreds of Cheshire, thirteen houses in Chester itself, free of tax, one for the warden or head of the community, the rest for the canons. These were in turn ejected by Hugh Lupus in 1093, when he established in their stead an abbot and convent of the Benedictine rule. Chester could boast of a much older building in St. John's-without-the-Walls, if the tradition which ascribes its foundation to King Ethelred, in 689, has any ground of truth. St. John's was the scene of the great pageant when it was visited in solemn pomp and ceremony by King Edgar the Peacegiver, in 960, in his imperial progress round Britain, after being rowed from his palace on the Dee by the eight vassal kings who there did homage to him. St. John's, too, was repaired and enriched by Leofric of Mercia, and still later became the cathedral of Peter, the first Norman bishop of Mercia, who built the nave and tower piers. Some few miles away in the same county, but several years earlier, in a solitary swampy district, another bishop had taken refuge from the marauding Danes—Plegmund, Alfred's archbishop, who has given his name to Plegmundstall. The dedication of a church in Chester to St. Olave points to a settlement of Danes at Chester itself. This church stands, as might be expected for a church built by the roving Dane, not far from the river bank and outside what has been considered by some to be the line of the original Roman wall before the circuit of the city was extended by Ethelfleda. A list of ancient dedications which throw light upon the early establishment of Christianity in Cheshire—St. Leonard, at Warmingham and Taxal; St. Helen, at Tarporley, Witton; St. Bridget, at West Kirby and Chester; St. Martin, Chester; St. Oswald, Bidston, Blackford, Chester, Peover Lower, Malpas, Worleston, Brereton; St. Hilary, Wallasey; St. Wilfred, Grappenhall, Davenham, Mobberley, Northenden; St. Boniface, Bunbury; St. Chad, Farndon, Tushingham, Over, Wybunbury, Chadkirk, Handforth; St. Edith, Shocklach; St. Alban, Tattenhall; St. David, Wettenhall; St. Lawrence, Frodsham, Over Peover, Alderley, Stoak; St. Werburgh, Warburton and Chester.

THE TRIBUNAL OF APPEAL.

THE following regulations as to the procedure to be followed in cases of appeal and the fees to be paid under the new Building Act have been made by the Tribunal, and approved by the Lord Chancellor in accordance with Section 184:—

All communications shall be written, type-written, or printed on foolscap paper.

All drawings shall be on tracing linen and in duplicate.

Any further drawings or copies of drawings shall (if so required by the Tribunal) be supplied by the appellant.

Appeals shall be addressed to the Tribunal of Appeal and shall be lodged and the fee thereon shall be paid at the office of the Tribunal, No. 13A Great George Street, Westminster, S.W., by hand, within the period (if any) prescribed by the Act; and where no period is so prescribed, within fourteen days after notice of the decision, determination, certificate, requirement, or regulation appealed against has been given to or served on the appellant.

The appeal, which shall specify the section and subsection under which it is made, shall be accompanied by copies of the original application and of the decision, determination, certificate, requirement, or regulation appealed against, with copies in duplicate on tracing linen of all plans or drawings relating thereto. These documents shall be supplemented by a short statement of the facts, setting out the grounds of the appeal, together with a list of the names and addresses of all parties to

whom notices under the original application and of this appeal have been given.

The appellant shall also within the time limited for lodging the appeal give notice of such appeal to the London County Council, and in cases where the original applicant is not the appellant, to such applicant, and in case of an appeal under any of the following sections also to the persons mentioned opposite such section.

Section.	With Reference to.	Persons to whom Notice to be given.
5 (8)	The superintending architect's determination as to the level of the ground.	The superintending architect.
13 (3)	The Council's determination that the prescribed distance shall be greater than 20 feet from the centre of the roadway.	The district surveyor. The local authority.
13 (4)	The Council's consent to the erection, &c., of any building, &c., at a distance less than the prescribed distance from the centre of the roadway.	The local authority. The owners and occupiers of the nearest building on each side of the proposed building.
19	The refusal or conditional grant of Council's sanction under Part II. to streets.	The local authority.
19	The refusal by a district surveyor of his certificate to plans of a building or structure to be altered or re-erected under Section 13.	The district surveyor. The local authority.
25	The certificate of superintending architect as to general line of buildings.	The superintending architect. The local authority and all other persons entitled under Section 24 to notice of the superintending architect's certificate.
29	The certificate of the superintending architect determining in what street or streets a building or structure is situate.	The superintending architect. The local authority and all other persons entitled to notice of the superintending architect's certificate.
43 (i) & (iii)	The refusal of a district surveyor to certify plans.	The district surveyor.
44	The Council's determination in cases where a person desires to rearrange a cleared area.	The local authority.
46	The superintending architect's certificate determining the front and rear of a building.	The superintending architect.
48 (2b) & (4)	The Council's refusal to allow a building to be erected to a greater than the prescribed height.	Such owners or lessees as the Council may under this section direct.
78	The district surveyor's requirement respecting the construction of public buildings in case of disagreement.	The district surveyor.
79	The district surveyor's requirement respecting the conversion of any building into a public building in case of disagreement.	The district surveyor.
122	The Council's refusal to permit, or any of the Council's regulations as to, or the decision of their engineer, or conditions imposed on the Council's grant of a license for the erection of dwelling-houses on low-lying land.	The Council's engineer. The local authority.
132	The refusal of a district surveyor to grant a certificate as to sky-signs.	The district surveyor.

All documents lodged with an appeal shall remain deposited in the office of the Tribunal as records of the case.

After the lodgment of an appeal the earliest convenient appointment shall be arranged for the hearing of the appeal, and shall be communicated to the parties by letter. The fees in respect of the view (if any), the hearing and order shall be paid by the appellant before the hearing.

Appeals shall be heard at such place as the Tribunal may from time to time determine.

The hearing of appeals shall be open to the public.

The full Tribunal of three members shall sit to hear appeals.

The London County Council and the parties interested

may appear before the Tribunal either in person or by counsel, solicitor, or agent, and the procedure at the hearing shall, subject to such variations as the Tribunal may think fit, be similar *mutatis mutandis* to that adopted on the trial of actions before the High Court, thus:—

Preliminary objections, if any, to be heard and disposed of. Appellant to state his case and call his witnesses.

Respondent to state his case and call his witnesses.

Any other parties interested to be heard.

Appellant to reply.

The decision of the Tribunal shall be embodied in an order in writing under the seal of the Tribunal.

The original order and all documents relating thereto shall be filed and preserved in the office of the Tribunal.

Office copies, under the seal of the Tribunal, of orders and other documents shall be upon payment supplied to any party to an appeal, and shall be admissible in evidence for all purposes of the Act, and regulations to the same extent as the original would be admissible. All copies of orders or other documents appearing to be sealed with the said seal shall be deemed to be office copies without further proof.

The file of documents shall be open to inspection by any person at the office of the Tribunal between the hours of 11 and 3.

The fees to be paid to the Tribunal by the appellants and other parties are as follows:—

	Higher Scale.*	Lower Scale.†
	£ s. d.	£ s. d.
Lodging appeal	2 0 0	1 0 0
View	2 0 0	1 0 0
Hearing	5 0 0	2 0 0
Order	2 0 0	1 0 0
Stating special case	2 0 0	1 0 0
Inspection of an order	0 1 0	0 1 0
Inspection of file of proceedings	0 2 6	0 2 6

Office copies, 6d. per folio. Plans, &c., according to work involved.

Copies other than office copies, 4d. per folio. Plans, &c., according to work involved.

The preceding regulations as to procedure and fees to be paid were made by the Tribunal of Appeal in accordance with the London Building Act, 1894, section 184. This 21st day of February, 1895.

For and on behalf of the Tribunal, ARTHUR CATES,
Chairman of the Tribunal.

Approved: HERSCHELL, C.

March 1, 1895.

THE GLASGOW SCHOOL OF ART.

A MEMORIAL has been sent by the Governors of the Glasgow School of Art to the Lord Provost and members of the Town Council seeking for aid to erect a new school, for which the Bellahouston Trustees have offered a site costing 6,000*l.* and a cash grant of 4,000*l.* It states:—

The Glasgow School of Art occupies premises in the Corporation Buildings, Sauchiehall Street, at an annual rent of 200*l.* The accommodation is limited and is not well adapted for the advanced instruction which is given.

When the art gallery and museum scheme was proposed, a School of Art was also projected as part of the scheme, and architects were asked to include the necessary accommodation in their drawings. The accepted designs contained provision for a School of Art.

Some of the subscribers to the Art Gallery and Museum Fund gave their subscriptions on the understanding that a School of Art was to be provided in the proposed buildings.

The Parks and Galleries Trustees, however, found that administrative difficulties might arise between the Corporation and governors of the School of Art as joint but independent occupiers of the same building, and a deputation from the school having met a committee of the Parks and Galleries Trust, the whole matter was discussed, and it was finally minuted that the Parks and Galleries Trustees "as from the time when the new buildings are ready for occupation should during their pleasure allow the School of Art such accommodation on the upper floor in the galleries in Sauchiehall Street as they may require at a nominal rent of, say, 1*l.* per annum." This was finally approved of by the Parks and Galleries Trustees on January 7, 1892.

Although the accommodation thus offered would not be altogether satisfactory, yet, with alterations, it was hoped a fair School of Art would be obtained. The governors accepted the arrangement, recognising the desire of the Town Council to furnish accommodation suitable for the school, and knowing

* The higher scale shall apply to cases relating to lines of frontage, laying out of streets, open spaces about buildings, height of buildings, conversion of buildings into public buildings, and low-lying lands.

† The lower scale shall apply to all other cases.

that the relief from rent would be of great assistance to its finances.

Matters have thus remained from 1892 to the present time. They have now, however, assumed a new complexion.

The Bellahouston Trustees have, in reply to an appeal from the governors of the school, granted a bequest of 10,000*l.*, in the form of a free site costing 6,000*l.* and 4,000*l.* in cash, on condition that 6,000*l.* be raised otherwise.

The governors of the school have ascertained that a plain building giving accommodation equal to the present, and having nothing in its composition beyond the barest elements of utility, would cost not less than 15,000*l.*, exclusive of site.

The governors would appeal to the Town Council to make the School of Art such a grant as would secure the 10,000*l.*, which the Bellahouston Trustees have offered.

The governors lay these matters before the Town Council in the assured belief that favourable consideration will be given to their appeal, not only because of the special arrangement about premises mentioned above, but also because of the usefulness of the school itself. The raising of 11,000*l.* imposes a serious task upon the governors, and their only hope of accomplishing it is by the Town Council recognising, on the one hand, the benefits they will derive from the present premises being vacated, and on the other, the advantage of obtaining accommodation specially adapted to the needs of the school.

THE WAVERLEY HOTEL COMPETITION.

A LETTER has been addressed to the directors of the North British Railway, by Dr. Rowand Anderson, architect, with reference to the construction of the proposed hotel and offices at the Waverley Station. He says that the circumstances connected with the competition and the decision of the directors had been so extraordinary that he thought an explanation was due alike to the competitors, the architectural profession and the public. Apart from the competitor whose designs had been accepted, five architects of established reputation were invited to compete, and he was justified in saying that they all devoted much labour and expense to the preparation of their plans. It was freely stated to himself and others that they might save themselves the trouble of competing, as the result was a foregone conclusion. It was now abundantly evident that the designs had not been carefully considered. By whatever process the decision of the directors was arrived at, it certainly was not reached by the only proper course of considering each set of plans in detail and comparing them with each other. The directors could have entrusted the work of designing the building to any person they pleased, without going through the solemn farce of inviting designs. Having invited competition, they ought surely to have allowed a decent and sufficient interval for adequate consideration of the designs to elapse before announcing their decision, instead of adding insult and a public slight to the injury inflicted on the competitors, whose labour, thought and outlay had been wasted.

ARTS AND CRAFTS.

A LECTURE was given in the Glasgow Corporation Art Gallery by Mr. F. H. Newbery, head-master of the school of art. There was a crowded attendance, and the chair was occupied by Baillie Burt. The lecturer, who stated that the art and the workshop about which he intended to speak were those of Scotland past and present, gave as the argument of his lecture that handicraft, that is, work done by the human hand, was neither dead nor dying, but living and progressing; that if to facilitate wholesale production beyond bare necessities it had become an object that all labour that could be done by the machine should be done by the machine, yet this state of matters could never affect the question of the standard of artistic value of handicraft, for to produce that the machine was powerless; and lastly, that the present demand for technical education was largely a question affecting less the craftsmen working in a tradition of art handiwork than the workman waiting upon the machine. After defining terms and giving illustrations of what he meant by tradition, the lecturer took the art instincts of the Japanese, about which so much was heard and said, and compared them with those possessed by the Scottish nation when the village industries were thriving, and stated that the productions of the workmen here during that period would not find, as they do, choice places in æsthetic drawing-rooms unless there was something more than antiquity to recommend them. The beauty of these pieces of furniture, weaving, ironwork, &c., lay in their art and in their workmanship; that the presence of these qualities existed by the vital fact that they were made in workshops by art craftsmen; that the workshop was the centre of all art work;

and until this state of matters existed again no real progress could be made. No apology for the workshop was possible. Dealing next with traditional crafts which still exist among us, the lecturer dwelt upon the present state of handicraft education, ridiculing the rules laid down by the State as to trade teaching, and described very fully the method of State instruction pursued in France, which nation possessed a very complete system of technical education under State control, and produced workmen among the best in Europe. He stated that although this was the case, yet no country was in advance of Great Britain either in the standard of the work produced or in the class of artist designers who produced it, and finished by giving the outline of a scheme of education which might be adopted and fitted to our present system.

EDINBURGH ARCHITECTURAL ASSOCIATION.

AT the meeting of the Edinburgh Architectural Association, Mr. W. W. Robertson presiding, after the transaction of some formal business, Mr. A. Hunter Crawford read a paper on "The Suburban House." We were leaving behind us, said the lecturer, the idea that the portico of a Greek temple might be adapted to the porch of a suburban house, and we even thought now that the perfect propriety and respectability of Newington might be improved upon. The typical plan of the builder was inconvenient, unsatisfactory and commonplace. It was awkward without quaintness, and externally lacking in character. A well-designed house was homelike from the outside, convenient in its arrangements and interesting in its features. A good plan greatly depended on the size and arrangement of the hall and staircase, on the pantry and its relation to the dining-room, kitchen and entrance, and on the limited space wasted in passages. The lecturer illustrated by limelight views good and bad types of plans, and then proceeded to contrast stone and brick houses, advocating a freer use of brighter and warmer materials. Characteristic work by Messrs. R. Norman Shaw, R.A., George Sherrin, Ernest George & Peto, C. F. A. Voysey, Ernest Newton, E. J. May and other able architects was shown on the screen. The lecturer then referred to varied treatments of staircases, bedrooms and ingle-nooks, and closed his paper by expressing the wish that greater attention be given to the design of our houses, more particularly the smaller ones, and that Edinburgh might not only be noted for her beautiful situation, but also for her charming suburbs.

GLASGOW ARCHITECTURAL ASSOCIATION.

THE annual business meeting was held in the rooms, 114 West Campbell Street, the president, Mr. A. N. Paterson, in the chair. The seventeenth annual report, which was read by Mr. W. R. Watson, secretary, narrated the work of the Association during the past session. Memorials, it stated, had been addressed by the Association to the Town Council relative to the proposed removal of the Tron steeple, and to Her Majesty's Office of Works with reference to the repairs in progress at the cathedral. The most noteworthy event of the session had been the successful arrangement of a scheme of co-operation with the Glasgow Institute of Architects for the acquirement of premises to be jointly occupied by the two Societies. Owing to the difficulty of finding suitable accommodation the arrangement was deferred in the meantime. The Association Travelling Studentship, of the value of ten guineas, had been awarded after a close competition to Mr. George Gunn, member. Mr. Fraser, hon. treasurer, submitted the financial statement, after which the report was approved of. The following office-bearers were elected for the ensuing session:—Hon. president, Mr. Malcolm Stark, jun.; president, Mr. Alex. N. Paterson; vice-president, Mr. Wm. Tait Conner; secretary, Mr. Walter R. Watson; assistant secretary, Mr. Hugh Dale; treasurer, Mr. George Hill; librarian, Mr. Alex. McGibbon; general committee, Messrs. Wm. J. Anderson, George Copland, Wm. Fraser and Robert J. Gildard.

LIVERPOOL ARCHITECTURAL SOCIETY.

AT the meeting of this Society on Monday evening, in the Law Library, Union Court, Mr. Henry Hartley presided. He referred to the death of Mr. Charles Aldrich, F.R.I.B.A., saying that he was one of the oldest, most active and most esteemed members of their Society. Mr. T. Cook, in moving a vote of condolence with the family of Mr. Aldrich, said that his deceased friend was one who was highly thought of by the whole of the profession. Mr. Matear seconded the vote, which was carried. A paper by Mr. Percy S. Worthington, of Manchester, entitled "Churches of the Twelfth and Thirteenth Centuries in Burgundy," was afterwards read.

YORK ARCHITECTURAL SOCIETY.

AT the meeting of this Society Mr. John Lane delivered a lecture which was entitled "The City of Brussels." Mr. A. Pollard, past president, presided. In his lecture Mr. Lane described the places of interest in Brussels, considered both from the visitor's and the architect's point of view, and particularly mentioned the cathedral and chief churches, and the celebrated Palace of Justice and the boulevards. He also spoke of the laying-out of the existing city, and the improvements that had taken place in the buildings during the present century. The lecturer gave a short account of the history of Belgium, and of the wonderful progress that had been made during the reigns of Leopold I. and Leopold II., the present king. The lecture also included a description of Belgian peasant life, and treated of several places of interest in Belgium.

WOOD-PULP MOSAICS.

GERMAN has lately invented a process for manufacturing floor mosaics from wood-pulp, of which Const. Stern, of Bamberg, gives the following description:—Several particles of wood, such as saw-dust, fine shavings, &c., are soaked in a mixture of shellac and alcohol, so that the pores of the wood are penetrated and thoroughly dried. A cement, consisting of fresh cheese whey and slacked lime, is then prepared. This cement is thinned with water, and then mixed thoroughly with the already dry wood particles in such a way that the consistency of the mass is uniform. Particular care is taken to render the cement as thin as possible, so that it will distribute itself easily and uniformly, and enclose each particle of wood as perfectly as the shellac solution. The mixture thus produced is allowed to dry until it is only moist, not thoroughly dry as before, for in the latter case the curd would lose its cohesive power. The moist pulp is then put into heated mosaic moulds of the desired shape and size, and in these forms placed under the press. As a result of the heat the shellac softens, regaining its adhesive powers, and the curd cement hardens rapidly, so that both of the substances, the shellac as well as the cement, unite under the pressure so perfectly with the wood particles that the wood mass resulting may within a few minutes be taken out of the moulds without losing the form received. After the cooling process and complete hardening these mosaics, it is claimed, are far less susceptible to any change of temperature or moisture than any natural wood. It is necessary that the use of every other ingredient, especially if of an oily or fatty character, should be avoided in this character, as otherwise the close union of the shellac with the curd cement would be retarded or even prevented. Wood-pulp for the manufacture of multi-coloured mosaic is prepared in the following manner:—The particles of different varieties of wood are put through the process separately, so that the natural colour of the wood itself is brought into prominence. Dyes dissolved in alcohol are mixed with the shellac solution before the wood particles are coated. The wood particles are first coloured with dyes dissolved in water, and allowed to dry well before coating with the shellac solution. For simple floors it suffices to manufacture mosaics of different colours, changing them at pleasure, so as to form a variety of patterns. The manufacture of pattern or fancy wood mosaics is proceeded with as follows:—Pattern moulds of the required design divided into fields and figures are fitted into the plain mould; each section of the design is filled with the wood-pulp, dyed as before described, and the pattern mould removed, after which the whole, thus freely outlined, is subjected to heat and air pressure as before mentioned, the result being perfect varicoloured, fancy mosaic. This wood mosaic, in spite of its hardness and resisting qualities, still retains all the essential properties of wood, being adapted for use as floor covers in living-rooms and similar purposes.

PERPENDICULAR WINDOWS.

WHEN a Perpendicular window is of five lights, which is frequently the case in larger windows, the central light is a continuous panel from top to bottom, and from the mullions of this the sub-arches spring on either side, as in the clerestory of York and in Henry VII.'s Chapel. This arrangement does not occur in any other style. In debased Perpendicular work the window arch often becomes round, or the point is scarcely perceptible. The cusps in the tracery of Perpendicular windows are often formed in rather a different manner from those used in the earlier styles; they seem to grow more naturally out of the mullions, and are not so much like insertions; while in some examples of the Early English style they actually are worked on separate pieces and let in a groove in the mullion. This would be impossible with the Perpendicular cusps. The points of the cusps are sometimes ornamented with roses or foliage, as in the west front of Winchester

Cathedral and in a few of the original windows at New College, Oxford. In Perpendicular screens and other woodwork this sort of floriated cusp is very common. Not only the transoms, as already mentioned, but the sills also of windows of this style are often battlemented, as in the west window of Merton College Chapel, Oxford. This is one of the instances of the abuse of the battlement by using it too profusely as an ornament in this style. The Tudor flower ornament is almost equally abused in the later examples of this style; it is used on the transoms of windows, and instances may probably be found of its use on the sills also.

GENERAL.

Professor W. C. Unwin will deliver the "James Forrest" lecture this year, at the Institution of Civil Engineers, on "The Development of the Experimental Study of Heat Motors."

An Exhibition of paintings by eleven Scottish artists—mostly of the Glasgow school—is now open in Schneider's Gallery in Frankfurt.

Mr. Silvanus Trevail, architect, and Mayor of Truro, has been elected representative of that city in the County Council by a majority of 328. Mr. Trevail has been member for Truro during six years.

The late Admiral Beechey, who died at Southsea, possessed more than the average amateur's skill as a painter of sea-scapes. Many of his pictures are at Osborne. He was a son of Sir W. Beechey, R.A., the portraitist.

The Kirkwall Town Council were informed at their last meeting that heating or other pipes had been erected on the north side of the roof of St. Magnus Cathedral without the consent of the municipal authorities. The pipes were described as monstrosities, and it was unanimously agreed to order them to be taken down, and notice was to be given that if this were not done immediately, and the building restored to the same state it was in before operations were commenced, the work would be done by the Town Council at the expense of the contractor or the kirk session of St. Magnus.

The New Society called "Sunday Clubland" will be inaugurated at the Institute of Painters in Water-Colours on the 24th inst., the galleries having been secured for a succession of Sunday evenings during the summer and winter seasons.

M. Peynot's Design has been adopted for the memorial of the late President Carnot which is to be erected in Fontainebleau.

Mr. Caw has been appointed curator of the National Portrait Gallery, Edinburgh, an office which was held by the late Mr. J. M. Gray.

The Governors of the Llanelly Intermediate and Technical Schools have decided to advertise for plans and designs for schools to be erected on the site at Marble Hall, at a cost not exceeding 5,000*l*.

The Twelfth Annual Exhibition of Pictures painted by the Glasgow Society of Lady Artists has been opened.

Mr. J. Medland Taylor, of Manchester, last year prepared plans for the rearrangement and improvement of the great Renaissance church of St. Philip, Salford. The work is now about to be begun, and will include, as funds permit, interior decoration in mosaic, fresco or painting.

Mr. James Paton, curator of the Glasgow Corporation Art Galleries, has delivered a lecture on "The Great Venetian Painters" in the Museum Hall.

Mr. E. M. Leman, at the meeting of the Surveyors' Institution on Monday, the 18th inst., will read a paper on "Agricultural Credit Banks."

Colonel Edis, F.S.A., read a paper on "Internal Arrangement and Decorative Treatment of Town Houses" at the last meeting of the Architectural Section of the Glasgow Philosophical Society.

Mr. A. E. Campbell has resigned the post of borough surveyor at Stratford-on-Avon, having been appointed surveyor for the city of Canterbury.

The late Mr. E. G. Paley's estate has been valued at 71,934*l*., which will be divided among his family.

The Works Committee of the London School Board have recommended that an honorarium of 500*l*. be given to Mr. Bailey, the architect, for extra work.

The Death is announced of Mr. Waller Hugh Paton, R.S.A., at his residence in Edinburgh on Friday, after a severe illness, lasting about a fortnight.

The Water-Colour Society of Ireland have just opened their fortieth exhibition of pictures in the Leinster Lecture Hall, Dublin.

Mr. Batsford will shortly publish an important work on "Modern Opera Houses and Theatres," by Mr. E. O. Sachs and Mr. E. A. Woodrow, architects. It will contain about 220 plates, and will represent foreign and English practice.

The Architect.

THE WEEK.

THE party known as Progressives in the London County Council have only an insignificant majority, but apparently it will be employed to uphold and extend the abuses which have brought the Council into disrepute. There is no doubt that the reaction which produced such a remarkable effect at the last election was caused by the conduct of the works committee. If any respect for the electorate was found among the majority the arrangements of the works department would be forthwith changed. On Tuesday an opportunity was offered and rejected. It was proposed to erect a Fire Brigade station at Fulham. The original estimate was 10,500*l.*, but at the architect's desire the amount was increased to 11,400*l.* The change was evidence that the estimates are not always exact, and it is therefore absurd to expect that contractors should not hesitate in accepting them as guides. In fact the works committee sometimes decline to be bound by them. Mr. WESTACOTT moved that tenders should be sought through advertisements. By a majority of six that course was rejected. As long as a majority, however small, can be secured the people of London must be content to pay heavily while amateur builders and their hangers-on amuse themselves by erecting buildings. There would be an outcry if toy bricks were ordered to be supplied to the children in the London Board schools, but the amateurs of the County Council can have any materials that are desired, as well as operatives of every class to make sport, while those who pay have not the privilege of looking on.

It would be interesting to know how much is paid ostensibly by the London County Council, but in reality by the taxpayers, in imprudent actions which are decided against the Council in police and other courts. Everybody is gratified when foolish litigants are made to suffer, but when the Council are unsuccessful it is the people who have no share in the excitement who have to pay. The summoning under the Building Act of late years is becoming a scandal. The latest case was one in which it was sought to mulct Mr. GROVER, the builder, for making openings in a party-wall at the corner of Harewood Place and Oxford Street. That would be a serious offence, but as it happened there was no party-wall to break into. The site in question was formerly occupied with stables, which were taken down. A building six storeys high was erected, and it was sought to be made out that one of the high walls which superseded a low party-wall continued to be a party-wall, although no part of it stood on land belonging to another proprietor. The magistrate, after examining the building, said the wall was an external wall, and there was nothing in the Building Act or in any judge's decision which would make it a party-wall. He awarded 10*l.* 10*s.* costs against the London County Council, which was satisfactory to Mr. GROVER, but which sum he, like other inhabitants of London, will have to bear a share in repaying.

ABOUT a year ago negotiations took place between the Glasgow architects, surveyors, and representatives of the building trades, when eventually a system of measurement for builders' work was agreed upon. The adoption of the system could not, of course, be compulsory, but after the trouble which was taken in its preparation it should not be lightly ignored. One of the first departures from it has been in respect of some model dwellings which the Corporation are about to erect in King Street, Calton. The quantities for the work have been taken out on a novel method. In Glasgow contracts are entered into with the various trades. The brickbuilders were the first to take notice of the variation from the approved system. They at once applied to the city engineer, by whom the plans were prepared, inquiring whether his consent or permission for it had been obtained. Mr. McDONALD, in reply, said that attention was called in the schedules to the mode of measurement; that the Improvement Trustees in the present case have

directed very earnest attention to the best means for providing the most economical shelter for the poor, and the measurer framed his schedule in such a way as to attain the result at which the Improvement Trustees aim. The brickbuilders say that while they would be perfectly willing to tender on a schedule framed in conformity with the Glasgow Mode of Measurement, 1894, as agreed to by the associated trades in conjunction with the Institutes of Measurers and Architects, they most respectfully decline to tender on the schedule as framed. The blank schedules were accordingly returned.

THE manner in which mosaics are now made in Venice for decorative purposes is quite different from the elaborate system used by the ancients, which consisted in fixing the tesserae one by one on the cement previously applied on the wall. The modern method of the Venetian school consists in executing the mosaic in the workshop, by having the tesserae fixed with common paste on the section of the cartoon assigned to each workman. When all the parts of the mosaic are complete they are put together on the floor or on a special wooden frame. The mosaic, which is then a perfect representation of the original cartoon, is again divided into sections on the reverse side, marked with a progressive number, and carefully packed to be sent off to the place for which it is intended. The surface of the wall where the mosaic is to be fixed is then covered with cement, into which the sections of the mosaic are uniformly pressed, according to their numbers and the key-plan supplied to the fixers. When the cement has hardened, the paper on which the tesserae have been pasted is gently taken off, and the faithful copy of the original cartoon is again exhibited on the right side.

THE Town Hall of Aberdeen is not without shortcomings as an example of Gothic, but like KEMP's Monument in Edinburgh it is impressive and is well adapted to a granite city. In Aberdeen as elsewhere municipal business has to obey the law of evolution, and the homogeneous must become the heterogeneous. The building is therefore less convenient than formerly, and must be altered. We are glad to see the Council have not decided to carry out the necessary alterations by the municipal staff. A competition will be arranged in which all the local architects can take part. There will be an assessor to judge the designs who will not be an Aberdeen architect. The author of the design adopted will receive the usual percentage on the outlay, and prizes of 30*l.* and 20*l.* will be given to the authors of the designs awarded second and third places respectively.

ACCORDING to the original arrangements, the first of the biennial international exhibitions promoted by Venice, which is intended to be a show of strictly original and select works of art, is to be opened next month. It is likely, however, that there will be a little delay before the exhibition will be in a complete state. No artist will be allowed to exhibit more than two works, except in special cases to be decided by the managing committee. No work already exhibited in Italy will be admitted. The following prizes will be offered:—The city of Venice, 10,000 francs; the Italian Government, 5,000 francs; the Province, 5,000 francs; and the local Savings Bank, 5,000 francs. The two first prizes will only be awarded to works that have never been exhibited in any Italian or foreign exhibition. For the other two prizes works which are not new may compete, provided that they have never been exhibited at any public Italian shows. Works that have obtained prizes remain the property of their exhibitors. No one will be allowed to copy or reproduce in any way the works exhibited without a written permission from their owners.

IN Glasgow an effort has been made to enhance the interest in the exhibition now open in the Fine Arts Institute by allowing the visitors to vote upon the merits of the paintings. It has been determined by a majority of votes that Mr. A. W. ALLAN'S *The North Ford Uist* is the best landscape in the gallery. The *Lady of Shalott*, by Mr. WATERHOUSE, was assigned a similar position among the figure paintings. Both works were exhibited in London.

THE EDINBURGH COMPETITION.

IT was commonly supposed that the old way of conducting architectural competitions was at an end. The British sense of fair-play had discovered that the selection of designs by men who might not be competent to understand a plan was an abuse. The system adopted is not always satisfactory. Architects cannot claim to be infallible or impeccable when they act as assessors. The limitation of the office to a few men has had, too, the disadvantage of making competitors curry favour by demonstrating that they were inspired by the works of the assessor—a sort of flattery which the best-disposed architects are not always able to resist. But on the whole the change has not operated disadvantageously. After every competition grumbling is inevitable, but less of it was heard since the aid of assessors was enlisted. Moreover, it never arises, as was the case formerly, from a belief that corruption prevailed. If the assessor is to be set aside, it would be more equitable to gamble for the first prize than to return to the old incompetent tribunals.

The case which has just occurred at Edinburgh is a sign that the evil which has broken many a heart is not extirpated. Like the prevailing epidemic, it takes a rest and then is as vigorous as of yore. It also leaves a legacy which is irritating. The work which was the subject of the competition, although only a hotel and railway offices, was from its position one of those blocks which architects covet. All visitors to Edinburgh are aware that the buildings above the Waverley Station, which are to be displaced, are an eyesore, because, from their surroundings, they provoke a contrast which houses so mean cannot sustain. The proposed hotel which the North British Railway Co. have been shamed into undertaking will be one of the most prominent objects in the city. If successful, it will bring more fame to its designer than a more important work on a less favourable site. It is no wonder, therefore, that the six architects who were selected as competitors were envied by their brethren, and that those who failed in the contest are not so resigned as architectural philosophy dictates in such cases.

Was it through a perfervid eagerness to begin the struggle for so fascinating a prize, or was it from faith in Scottish honour that the six competitors were indifferent to the important question who was to decide between them, and by what process was the selection to be made? Dr. ROWAND ANDERSON expresses a truism when he says, "In dealing with designs for a work of such magnitude, involving the consideration of the grouping and arrangement of hundreds of apartments, the directors ought, in ordinary course, to have had expert assistance and advice alike, as to the more purely architectural quality of the designs and their practical adaptability to the purposes to which the buildings are intended to be put." His words are applicable to the majority of competitions. Dr. ROWAND ANDERSON must, however, have forgotten when he penned them that judging everything on earth and beyond the earth is the daily occupation of all Scotsmen. The country abounds in tribunals which are unconnected with the Court of Session. Small farmers and village tradesmen have no misgiving in determining questions that would keep the episcopal wisdom of England engaged for months or years. In mundane questions there is, if possible, less hesitation. The exercise may have its drawbacks, and they have been often pointed out by Scotsmen, but it has helped to make Scotland great. If railway directors conclude it is not their duty to cast the judging of plans on a temporary help any more than other important affairs, they cannot be expected to call in an assessor to gratify the authors of the plans. In the north deputies are less in favour than in the south, and it is wisest to let both countries adhere to the rules which have guided them. If the advantage of appointing an assessor were demonstrated to the directors of the North British Railway Company, they would perhaps have made a different sort of arrangement. But as the competitors were silent on that subject it is hardly fair to treat the directors as if they acted unfairly. They never promised to call in an assessor. "The letter of instructions," says Dr. ANDERSON, "stated that the directors should be the sole judges of the designs, but did not suggest that the directors were not to adopt the only possible methods of forming a judgment." In a case of so much importance why did not one or other of the competitors endeavour to

obtain a precise declaration on the subject? Architects are supposed to be familiar with the forms of business, and clients would not be gratified if they discovered that MACBETH'S words, "Nothing is but what is not," were applied as a principle in the interpretation of documents relating to contracts. Because the directors were silent on the subject of an assessor, by what law of logic should it be concluded that they had decided on his appointment? Why should the competitors' assumption be accepted as if it were a resolution duly entered on the minutes of the company?

We grant that the work undertaken by the directors was beyond the capacities of any small body of laymen in Scotland or England. Dr. ANDERSON says that he himself and a dozen of assistants were entirely occupied with the plans during eight weeks, and we may assume that the remaining competitors expended as much time, labour and money on theirs. The block treated contained a large hotel, offices and shops. The subject to be adjudged upon was therefore more complicated than any of the engineering schemes for operating on the Princes Street Gardens. But on that account the architects, as they were able to anticipate the character of their arrangements and were aware of the complexity of the problem, which the directors were not, should have had the foresight to insist, at least, on an investigation of their plans by some competent expert.

We may assume that the directors did not treat the plans as if they were competition designs for a poster to represent the scenery along their railway. There was time for a sort of examination. The drawings, we suppose, were sent in not later than February 11, and for all we know to the contrary, railway officials, a hotel manager or two, and some of the engineering staff may have been occupied with them during the two following days. A report dealing with the designs according to the company's requirement could also be prepared. In that way the directors would be able to arrive at a decision after a day's consideration of the report and drawings. So much expedition might not be seemly in dealing with architectural designs, but we suppose it was in keeping with the practice of the company.

Whether the best or the worst design was adopted we are unable to affirm, as we have not seen the drawings. As a rule the architectural work in connection with railways is only satisfactory in the eyes of the engineers and managers. Their principles are known to the initiated alone. But it is a pity that so exceptional a competition was not destined to have a more satisfactory result. If, as Dr. ANDERSON suggests, the result was a foregone conclusion from the first, no words can be too strong to condemn the conduct of the directors. There are, unfortunately, precedents for that sort of injustice, but as there was no compulsion on the directors to obtain designs by competition we cannot see what was to be gained for the shareholders by involving five architects in useless expenditure, anxiety and regrets. The statement it appears was freely made to some of the competitors before their operations were commenced, and their indifference to the method to be employed in judging becomes therefore more remarkable.

In all such cases of competition it should be remembered that there is no Court of Appeal for architects. What is called public opinion, with all its susceptibility, is not to be moved by any wrong inflicted on them. On that account there cannot be too much security sought in all arrangements relating to practice. The North British directors, like other bodies, are unable to realise how much has to be gone through in order to produce plans of a building. It is supposed they are not so difficult as plans of a line, because the latter represent work that is generally far more costly. When they find that designs for a work like the hotel and offices at the Waverley Station will be prepared by numerous architects without any stipulation that the examination and selection are not to be performed in secret, they are hardly to be blamed if they conclude that designing is easy, and the percentage paid for it is exorbitant.

M. Paul Lenfant, the well-known Paris architect, has died suddenly. He was a pupil of Constant Dufeu, and, with Davioud, constructed the Châtelet and Lyrique theatres.

WERNER VON SIEMENS.*

THE second volume of the Technical Papers by the late WERNER VON SIEMENS will probably be considered to have a more practical character than the companion volume, which we noticed when it appeared. Every page which the author produced related to practice, for, as he once explained, his imagination was controlled by reality. As he said of himself, "I have not been accustomed to give imaginary pictures without an actual serious background." The contents of the second volume on the whole have a nearer relation to the workaday world, for most of the pages relate to those applications of electric power which gained fame, wealth and influence for the author's firm. We can trace the history of his processes from March 1842, when Second-Lieutenant WERNER SIEMENS was granted a patent for dissolving gold by means of the galvanic current for gilding, until August 1890, when one was obtained for "Improvements in the apparatus for the measurement and summation of the energy passing through a conductor in continuous or alternating currents." We have in the volume exact descriptions of the scientific novelties produced by one of the most fertile inventors of the century. They are gainful for all who have an interest in the utilisations of electricity, and form a record which will always be invaluable for students of the history of the science. An abundance of diagrams is an auxiliary in the comprehension of the specifications. The apparatus for electric telegraphs, electric railways, electric lighting, electric writing and printing, electro-dynamic machinery, electric steering, electric hammering, &c., all owe much to WERNER VON SIEMENS. In one place we read of electricity as an aid against danger by fire, or as an aid against fire-damp in mines; in another of an electric voting telegraph, and elsewhere we not only have an account of an electric plough, but suggestions about "the possibility of producing food stuffs by means of electricity." The SIEMENS helped to realise ARIEL's scheme of putting a girdle round about the earth, but that achievement seemed to them to be only a modest instalment of what could be accomplished by means of electricity.

Men like the SIEMENS and their partner, Herr HALSKE, were novel phenomena in a country like Prussia, which half a century ago was not remarkable for its practical engineering. Apparently facilities were not given to them to conduct the operations which were to enrich the kingdom. There is a passage in the volume before us which suggests that circumlocution was not confined to England, and, strange to say, the principal agents who made the system embarrassing for the SIEMENS and men like them were architects. WERNER VON SIEMENS says:—

With us there is no place in the State organisation for the civil engineer, or any actual engineer; with us the architect is the technical organ of the State administration, the only material considered as qualified out of which the State forms its technical dignitaries, advisers and officials. With us a man must have studied architecture, not only, as in other countries, to build palaces and mansions, but streets, bridges and canals, as well as railways and telegraphs. Not even the laying out of our factories is permitted us without the directive action and control of the architect, to whose arrangements and decisions we must everywhere submit. That this multiplicity of study must lead to superficial knowledge, and can neither produce capable architects nor engineers, is quite comprehensible.

It may have been owing to prejudice against architects that so little is found in the volume relating to building. He has to deal with electric lighting, but apparently he was indifferent about the effect on the rooms or halls in which it was introduced. He was quite prepared to have the geometric streets of Berlin spoiled so long as lines of electric railways traversed them. In fact, the only part of the volume in which he expresses disappointment is where that subject is treated, as when he says:—

After the discovery of the dynamo-electric principle and the possibility thereby given to produce sufficiently strong currents cheaply, I already dreamed of a net of elevated electric railway lines over the streets of Berlin, whose low-water level unfortunately admitted of no underground railway system. But a long line of technical advance had first to be traversed, and a great deal more water will flow through the Spree before my dream can be carried out, even to a small degree.

Some excuse must be made for SIEMENS's indifference to architecture. In Berlin he could find reproductions of ancient forms as mechanical as any which might be turned

out by a machine set in motion by electricity. To a man of his temperament, who in his mind's eye could see a transformed world, an art which seemed to show a defiance of progress could only be considered as one of the survivals which were not worth respect. For a belief in progress inspires all the addresses which were delivered by WERNER VON SIEMENS. In a similar spirit to NEWTON, when he said he was like one standing on the sea-shore while the ocean of truth lay beyond untried, the electrician described himself as a mere dweller in the porch of science. He saw so many benefits arising from what was already made known by men of science, and turned to account by engineers, that his vision of the future was not dimmed by all the pessimism which his countrymen could create. Although the SIEMENS factories were colossal, he could not, however, suppose that the destiny of the world would never be attained until it had become one factory of innumerable workers, with a few directors. The great objection which many raise against the system is met by WERNER VON SIEMENS in the following way:—

For the further, and apparently most important, complaint of the opponents of our present social development—the assertion that through it the great majority of mankind was doomed to the performance of work in great factories, and that by the progressive division of labour there remains no space for free labour of the individual—also for this the natural progress of the development of the age of natural science has its own remedy. The necessity of large factories for the cheap production of articles of consumption is principally caused by the as yet small development of mechanical engineering. Hitherto large machines have supplied mechanical work much more cheaply than small, and the setting up of the latter in the dwellings of workmen is connected, moreover, with great difficulties. Engineering will, however, infallibly succeed in overcoming this obstacle to the return to competitive hand-labour, viz. by the introduction of cheap mechanical power, that basis of all industry, into small workshops and the dwellings of artisans. A number of great factories, in the hands of rich capitalists in which "slaves of work" drag out their miserable existence, is not, therefore, the goal of the development of the age of natural science, but a return to individual labour, or where the nature of things demands it, the carrying on of common workshops by unions of workmen, who will receive a sound basis only through the general extension of knowledge and civilisation, and through the possibility of obtaining cheaper capital.

NAPOLEON considered that after military science had performed its best or worst in destroying men, there would be a return to the warfare of the Homeric times. It is therefore not improbable that the craftsman of the future will possess a machine of sufficient power to aid instead of superseding him. Nor will he consider he is acting unworthily by utilising it as a means to extend his own power. Let us imagine BENVENUTO CELLINI before some of the delicate cutting and drilling machines for dentistry which are imported from America. Can we suppose that he would not perceive the value of an instrument that was able, when guided by him, not only to save time, but to help him to realise designs more effectively? A machine of the kind is no more than one or several tools of a special kind, and as long as hammers, punches and chisels are allowed, a machine which combines them should not be rejected. But before producers on a small scale can again flourish there must be a vast change in the ethics of trade. Germany especially will have to again reform itself. WERNER VON SIEMENS was a German of the highest class, but with all his affection for his countrymen he did not hesitate to point out a weakness of theirs which has become infectious, and is producing incalculable mischief. One passage deserves to be given as proof of the honesty and courage of the man:—

Whilst in England, France and even in America it is considered dishonourable, or at least unbecoming, to make use of foreign inventions without the consent of the inventor, even if his right to protection is doubtful or does not exist, in Germany this is not only considered proper, but in many cases even meritorious. As a characteristic example in this direction, I only need cite that in Prussia itself technical State officials do not hesitate to deliver to other manufacturers as a pattern for imitation new mechanical apparatus or arrangements which are perfected by manufacturers with difficulty and expense, or to bring them into competition and to assign the execution to the lowest tenderer. They are even often obliged to do so by their instructions. In a similar direction those manufacturers frequently openly recommend their manufacture to us on this ground, that they imitate on principle only the most approved and most novel constructions of recognised important firms, and therefore can supply cheaper than these, as they had to bear no expense of imitation and trial. In other countries this would be considered as dishonourable; here, even State officials do not hesitate to make the best use of such apparently advantageous offers. The natural consequence is, that this anomalous

morality by degrees permeates from above downwards through the whole life of trade and commerce, that the endeavour to furnish what is new and better in industry occurs more seldom, that competition for cheapness alone is predominant, and German manufacture is everywhere disposed as goods of slight value. The gratifying pride of the English manufacturers, whom no prospect of gain would induce to provide goods with his mark which were not first class and would do honour to his firm, is unfortunately only in a few cases to be discovered amongst us. . . . German honesty, of which we sing and speak much, has abroad only a bad sound, to Germany's immeasurable harm. This dislike everywhere abroad to Germans and German ways has recently considerably increased.

But if the "anomalous morality" has been injurious to Germany and other lands where electric machinery and apparatus are produced, how would it work with the electro-chemical food which was one of those dreams of SIEMENS which had a basis of reality? Long ago Sir JOHN HERSCHEL gave his approval to a scheme for making bread out of sawdust, by which famines were to be rendered impossible. But WERNER VON SIEMENS went infinitely further, for he considered that a substance of the organic nature of sawdust was unnecessary. His nitrogenous food will probably not require teeth for mastication, and will therefore be suited for a time which is fast approaching when teeth will be mere ornamental appendages. The proposition is one of the most daring in the book, and what chemist would say it was impracticable?

Hydrogen and oxygen—explosive gas—is an excellent fuel, but difficult to apply. But in place of water, common salt, or another fusible salt, it can be decomposed by the electric current, and we have besides in solid sodium, potassium, magnesium or calcium fuels in solid form, produced with the help of the electric current by natural forces which are already more useful. It is, therefore, no baseless imagination, but a supposition based on quite determined facts, that in this way fuel can be produced by the application of forces existing in nature. The question of the production of foods is a much more difficult one. These are also essentially fuels. We burn the substance of the food by means of different chemical actions which occur in our bodies, and thereby supply the heat our life requires. But there is a second condition to be complied with. We must produce or renew the nitrogen combinations of our body. It is, therefore, necessary that the food should contain nitrogen combinations. Nitrogen is a peculiar body, which only enters with difficulty into combination with other substances. It is, therefore, necessary in order to produce food stuffs to arrive at means of getting over the difficulty of combining nitrogen. In organic nature this takes place by means of the life process of plants. In inorganic nature we have only nitric acid and combinations of ammonia, the origin of which is somewhat obscure. Therefore, in fact, my opinion that it would be possible at some future day to produce artificial food, which must contain nitrogen, would be a dream if a direction, a way did not already exist which gave a prospect of attaining in future the realisation of this hypothesis. (Werner von Siemens then described his ozone apparatus which would produce commercial nitrogen combinations). It is merely a thing of ordinary scientific technical advance to arrive at the production of nitrogenous bodies by a combination of chemistry with electrical science. In the same way hydrogen is produced in the so-called active condition in the ozone apparatus. It is therefore possible to produce mechanically in the future products belonging to the series of ammonia combinations. Whether electric chemistry will indeed solve the problem of so combining the substances necessary for nourishment that the animal body can assimilate them and make use of them as food lies in the future. Anyway, my opinion is no dream, but an hypothesis resting on a strong scientific basis.

The extracts will suggest that WERNER VON SIEMENS, when he allowed himself opportunities to treat of subjects outside his laboratory, was fearless, sympathetic, far-seeing and versatile. It is, however, as an inventor he is greatest, and there can be no better testimony to him as such than the precise descriptions of his discoveries and inventions in the collection of technical papers with which scientific literature has been enriched.

GOTHIC ARCHITECTURE.

A LECTURE in the Glasgow School of Art on English Gothic architecture, with reference to cathedrals, has been delivered by Mr. W. J. Anderson, architect. The general principles of their design were explained and compared with those of other styles, their divergencies from the continental type and the characteristics of their various periods. The Early English period was divided into lancet and geometric, and the term curvilinear preferred to decorated, as these forms in the window tracery were in England, an almost unvarying mark of the date of the building. In French Gothic the constant aim of the designer was to produce overpowering effect of internal height, the vaulted roofs demanding for their support a great scaffolding of superimposed flying buttresses as at Beauvais and

Bourges, which externally destroyed all sense of repose, suggesting nothing so much as a "half-built ship on its shores." If this was to be defended and praised in the prevailing fashion as the only true Gothic and the logical outcome of the Gothic idea, we were forced to believe that the Gothic idea carried to its conclusion was opposed to sound constructive science and to æsthetic effect. But the English mind of the thirteenth century aimed at an impression of great internal length and moderate height of avenues, which served their chief purpose best, and at the same time had the happiest effect externally, enabling them to rear such a central tower as would be the glory of the whole fabric. The great length gave repose externally, and the bold transept projection aided materially to produce a picturesque effect from any point of view. The group of central and western towers generally designed for English cathedrals, and carried out at Carlisle, Lichfield, York and Lincoln, was the finest that could be imagined, and there was no possible vantage ground which would give a disappointing view of such buildings. The apsidal termination of the interior of the French churches was magnificent, but was almost compensated for by the splendid eastern window of the English at Carlisle and Lincoln, for example, and the good appearance of the square end externally. The greater number of the English cathedrals were shown by lantern views, externally and internally and in detail, and a short series of views of Scottish architecture followed. The lecturer contended that in the main Scottish Gothic architecture does not differ materially from English work, and was less influenced by French Gothic than had been popularly supposed. Scotland was strong in transitional work, which often took the form of the pointed arch with Norman mouldings and the French square abacus and capital, as if the form of the pointed arch had travelled northward more swiftly than the appropriate details of the Gothic style. This it was which gave it the resemblance to French Gothic, as at Jedburgh nave, and this, it was suggested, had misled critics. In the chief distinctive features of the French style—excessive height, absence of central tower, general use of the apsidal termination, the square arch order, the central buttresses and chapels and the rose windows—Scotland had no part with France and the marks of French influence were not nearly so apparent as of English.

THE STORY OF TEL-EL-AMARNA.

A LECTURE was delivered before the Royal Dublin Society on the 13th inst. by Mr. Laurence E. Steele, M.A., entitled "A Romance in Egyptian Exploration: the Story of Tel-el-Amarna." He said:—Some two or three years ago, when the name of Tel-el-Amarna began to appear in our newspapers and magazines, people were much puzzled as to the import of the reference. Some, under the impression that it was the name of a new king unearthed by the explorers, asked "Who is Tel-el-Amarna?" Others, less anxious to display their very pardonable ignorance, put the question more cautiously, and asked "What is Tel-el-Amarna?" And it is even recorded that when references to the now famous clay tablets of Tel-el-Amarna began to occur, a wholesale druggist received a large order from an old and respectable customer, who concluded that they were a new form of voice-lozenge. It is perhaps unnecessary to remind this audience that Tel-el-Amarna is the name of a modern Arab village which is near the site of an old Egyptian city founded by a certain King Khuenaten, and which lies about 160 miles south of Cairo, on the eastern bank of the Nile, where the explorers have brought to light an extraordinary series of relics of the past. Mr. Steele, with the assistance of a large number of photographs, explained the characteristics of the period to which the extraordinary discoveries made by Professor Flinders Petrie had been assigned, and continued:—In studying any one of the many wonderful discoveries in Egypt of recent date, the very first thing we must do is to get as clear a conception as possible of the time to which the archaeologist proposes to assign the discovery. The discoveries at Tel-el-Amarna have been identified as belonging to the period of the eighteenth dynasty, the first king of which line commenced to reign in 1587 B.C. Let us realise the remoteness of this date. We may remember that Mary Queen of Scots was executed in the year 1587 A.D., so King Ahmes was as remote from the birth of Christ on the one side as that event in English history is remote on the other. And, again, we see that this dynasty lasted from 1587 B.C. to 1328 B.C., a space of 260 years, and that it contained fourteen kings. We may remember that our eight Plantagenet kings reigned for 245 years, so in duration this powerful Egyptian dynasty exceeded in length the line of our brilliant Plantagenet sovereigns by just fifteen years. But where does this date find us in reference to the chronology of other nations? Let us examine this "time-measuring rod" on which the dates are marked off in accordance with a scheme of chronology which has been published only within the last few months,

and we shall find that King Ahmes commenced to reign 800 years before the last Olympiad, when, in the year 776 B.C. reliable Greek history begins. But this difference of 800 years dwindles into insignificance when we come to consider this eighteenth line of sovereigns in relation to the majestic sweep of centuries through which the august potestates of Egyptian dynasties stretch in imposing array. For King Ahmes, as he looked back upon the gorgeous history of the past, would have to carry his memory back to a period no less than 400 years more remote than we are now from the birth of Christ, if he wished to realise the period at which King Cheops, of the fourth dynasty, erected the great Pyramid of Ghizeh, about 4,000 years B.C., at which point reliable monumental history begins. The most interesting of the sovereigns of this eighteenth dynasty were Queen Hatasu, Thothmes III., the constructor of the Thames Embankment obelisk, who died on St. Valentine's Day, 1449 B.C., Amenhotep III., and his son Khuenaten, the founder and builder of the old city near Tel-el-Amarna. The mummy of a preceding sovereign, Thothmes II., was discovered in the great find of mummies in 1881 at Deir-el-Bahari, near Thebes, and presented a curious problem for the physician. It was noticed that the body bore traces of some form of cutaneous disorder. Of this there was no doubt, but for the truth of the following incident, he (the lecturer), was unable to vouch. The doctors could come to no conclusion as to the nature of the affection, until the suggestion was offered that a careful examination should be made of the upper part of the left arm for certain well-known marks, but without result. Careful search was also made amongst the records for any reference to an Egyptian functionary at all analogous to our medical officer of health, or for any trace in the Egyptian legal system of compulsory vaccination, but in vain. We are therefore driven to the sad and inevitable conclusion that the great king perished miserably a victim to a prevailing epidemic. Queen Hatasu was possessed of a strange fancy. She always chose to speak of and represent herself as a king and not as a queen. She was a woman of great force of character, and managed to keep her two brothers off the throne of Egypt as long as possible. In this picture, executed by her direction, you see her carrying her masculine proclivities so far as to assume the dress of a man, even going so far as to add a beard. The historical parallel is obvious. There is nothing new under the sun, not even the new woman, for here we have the new woman existing no less than 3,400 years ago. But Queen Hatasu was a woman of superb artistic perceptions, and to her is due the erection of the lovely rose-coloured obelisk, only 8 feet short of the height of Nelson's Pillar, which stands in the midst of the ruins of Karnak—her greatest architectural triumph being the temple at Deir-el-Bahari, which the officers of the Egyptian Exploration Fund are at this moment clearing. Having shown some other photographs illustrative of this period of the eighteenth dynasty, the lecturer proceeded to explain, with the aid of photographs from the relics discovered at Tel-el-Amarna, the particular direction in which King Khuenaten exhibited an independence and an originality unparalleled in the history of Egypt, and continued:—To the ordinary traveller Tel-el-Amarna, until within the last two or three years, was an uninteresting spot, for nearly everything above ground was swept away within thirty years of the death of its founder—a few low and ruinous walls alone marking the site of the great city. The same oblivion had fallen upon the memory of its founder, and except for some caricatures of the king, and stories which all conspired to blacken his character with charges of heresy and other infamy, little was really known of him until Professor Flinders Petrie undertook the thorough examination of the spot, which has resulted in the rehabilitation of the character of the king, and in placing him in a unique position amongst the monarchs of Egypt as the originator of a religion and an art unexampled in the history of the land; for to him and to the group of artists which his strange personality attracted to Tel-el-Amarna, belongs the credit of having introduced for the first time the idea of perspective into Egyptian drawing and painting. Having shown several examples of the art of the time of Khuenaten, particularly some interesting and realistic paintings of "animals in motion," the lecturer said:—Having learned something of the works of this most original man, it becomes a matter of supreme interest to see if we can summon up from the dead past some portraiture of King Khuenaten, which will enable us to realise his personal appearance. We have not secured his mummy, as is the case with so many of his immediate ancestors, whose bodies were found in the year 1881 in an unsuspected rock-cut chamber at Deir-el-Bahari, but we have something far more valuable and more natural than the expressionless face of a parched mummy to enable us to recall the features of Khuenaten. To this part of the story of Tel-el-Amarna belongs the most sensational discovery. The now famous tablets of Tel-el-Amarna have thrown a marvellous flood of light upon the family history of King Khuenaten. We know from them that Khuenaten's father,

Amenhotep III., married a Mesopotamian princess, and who, there is a strong presumption in concluding, was the mother of Khuenaten. Her name is well known. She was a certain Princess Thyi, and her name and portrait appear many a time upon the monuments. Now, Khuenaten was an ugly man—of that fact we can assure ourselves by a glance at the picture on the screen—and is strangely unlike the portraits and mummies which recall the features of his immediate ancestors. It could also be shown that he was fat and ungainly, and he possessed none of that slim grace which appears to have been a thing of beauty in the eyes of the later Egyptian. But we must be content with an examination of his face. We perceive that the characteristic feature of his profile which is noticeable in this and in every other known portrait of the man is his protruding and abnormally-developed chin. It becomes an interesting question in heredity to learn how he came by this chin, which his father and his grandfather most certainly did not possess. The explorations at Tel-el-Amarna have given the clue by supplying us with several portraits of the Princess Thyi, which have demonstrated beyond any shadow of doubt that this strange cast of feature was inherited from his Mesopotamian mother. Now this by no means implies that Khuenaten's mother was an ugly woman. He (the lecturer) would be sorry to state the fact, even if it were true; but the monuments prove the contrary, and this picture of the queen is by no means an unpleasing portrait. She has the same strongly-marked, commanding chin which is so accentuated in her son's features. This peculiar cast of feature appears to have been characteristic of the Mesopotamian, as will appear from this sculptured head of a man of Mesopotamia, in which the same racial characteristics are expressed with plebeian coarseness. But this is not all. What is far more valuable than the mummy of Khuenaten has been found—what is far more life-like, if the paradox be excused—namely, the king's death-mask. Having exhibited a photograph of the cast of the face and head of Khuenaten, taken from the dead king's features, and found by Professor Petrie amidst the ruins, and having shown by a comparison with the death-mask of Dean Swift, preserved in the Anatomical Museum in Trinity College, the naturalness of the death-mask made over 3,000 years ago, the lecturer concluded by remarking that here the story of Tel-el-Amarna may fitly close with this last illustration of the relics of a past age found on the site. Driven from his old home at Thebes, Khuenaten died, like Alexander the Great, at the age of thirty, and with him perished all that he had lived for and all that he had worked for. It was the fall of one of the great movements of human thought, carried out by a single idealist, who set himself against the traditions, the religion and the habits of his country.

ABERDEEN ARTISTS' SOCIETY.

THE annual meeting of the Aberdeen Artists' Society was held on the 13th inst.; the Marquis of Huntly, president, was chairman. The annual report stated that the last exhibition was the most successful ever held in Aberdeen from an artist's point of view. The value of pictures sold was 2,528*l.*, being an increase compared with last season of 1,003*l.* The receipts for admission, catalogues and commission on pictures amounted to 266*l.* 1*s.*, or 10*s.* 5*d.* less than at the exhibition last year. The expenses amounted to 554*l.*, being 9*l.* 0*s.* 10*d.* less than at the previous exhibition. The annual subscriptions from 463 members (240 ordinary and 223 honorary) amounted this year to 350*l.* 12*s.* 6*d.*, and last year the subscriptions from 459 members (260 ordinary and 199 honorary) amounted to 358*l.* This year there was a net gain on the exhibition account of 62*l.* 12*s.*, as compared with a gain of 62*l.* 1*s.* 1*d.* on that of last year. The net profit on the season amounted to 67*l.* 11*s.* 8*d.*, which, added to 134*l.* 1*s.* 4*d.* in bank, makes a total of 201*l.* 16*s.* 6*d.* at credit of capital account.

The Chairman said he thought the members had a right to congratulate themselves upon the position the Aberdeen Artists' Society had now assumed, and he thought they would agree with him that the report submitted was most gratifying. The curious thing to observe was that, although the last two exhibitions were held at different times of the year, they had had pecuniarily almost the same result. Some of the members thought that holding an exhibition in the winter months would not be so satisfactory as the spring months, but he was glad to say that the art-loving public of Aberdeen had attended and patronised the exhibition as freely in the winter as they did in the summer. At all events, if they wished, they could continue their work with confidence, and if they continued it on the present lines they would certainly not become bankrupt. He thought in every way they could say the exhibition was a great success. He did not think there was any exhibition they had had in Aberdeen that so thoroughly typified all the forms of art and styles of painting, and he thought so thoroughly appreciated by the people of Aberdeen and district. And he only

hoped that, now they had sailed so successfully, the Aberdeen Artists' Society would continue to flourish. He should like to say something about the future. Perhaps they would not be able to have so large an exhibition at an early date as the last one, but he thought the Council might consider whether they could not have a similar exhibition of some sort, including local objects of interest, in connection with the approaching opening of the Marischal College buildings in October. At the end of next October there would likely be a considerable flourish of trumpets at Marischal College and a very interesting ceremony, and it would not be out of place, he thought, to get together in the galleries an exhibition of Aberdeen art and objects of interest to Aberdonians, and perhaps the exhibition might be made one which the public would patronise, and would be deserving of the success that had attended other exhibitions. He threw out the suggestion, although he did not suppose it would be possible to get a large exhibition of loan pictures on that occasion; but he thought there was enough in this district to make up a very interesting exhibition. He had much pleasure in moving the adoption of the report.

EDINBURGH ARCHITECTURAL ASSOCIATION.

ON Saturday the members of the Edinburgh Architectural Association visited the village of Upper Liberton, and were conducted over Liberton House, the former residence of the Littles, the owners of the Barony, by Mr. G. Godfrey Cunningham, advocate, the present occupant. The attention of the party was directed, in the first place, to the ground plan of the house, consisting of two blocks of building at right angles to each other, with a circular turret or tower in the angle, these, together with another block or annexe, enclosing on three sides a small square courtyard, the fourth side of which was once shut in by a wall and gate of defensive character. The special interest attaching to Liberton House lay in the fact that it belonged to a transition period, when defensive architecture, even in the case of structures without any claim to rank as a castle or fortress, had not yet been wholly abandoned, and when the state of society made it necessary to retain safeguards against sudden attack. Though disfigured externally by an alteration in the height of the walls, which had been considerably raised, and in the pitch of the roof, which had been depressed, the outlines of the original elevation were still clearly traceable. Lastly, the "Nelson room," a reconstruction of recent date, was explained to be an attempt arising out of structural considerations to introduce the half-timbered work associated, at least in Scotland, more often with the exterior than with the interior of the edifices in which it occurs. At the close of the visit the president, Mr. W. W. Robertson, F.S.A.Scot., proposed a vote of thanks to Mr. Cunningham, which that gentleman duly acknowledged.

TESSERÆ.

The Window Heads of Heriot's Hospital, Edinburgh.

EXTERNALLY great character is given to this building by the four square tower-like masses that adorn the angles; and between these, in what may be called the curtains, the windows are disposed without much attention to regularity either in design or position, the ornaments of each window being different, though all belonging to a class which is almost peculiar to Scotland. Generally the windows are adorned with a pilaster on each side supporting a richly-ornamented entablature, but above that, instead of the usual straight-lined or curved pediment used by the Romans and copied from them by the Italians, the Scotch employed a rich complicated piece of blind tracery, if it may be so called. As used by them, the effect is not always pleasing, the design being frequently ungraceful and the ornaments grotesque; but it is very questionable whether in principle it is not a more legitimate mode of adorning a window-head than the one we so generally make use of. It admits, at all events, of the most infinite variety of detail. Some of those at Glasgow College or in Regent Murray's house in the Canongate were as elegant as any; but there is scarcely a Scotch house of the early part of the seventeenth century which has not specimens to contribute. The style of these ornaments is singularly characteristic of the age. They show that love for quips and quibbles which pervades the literature of the day, but they show also that desire for cheapness which rather than beauty was the aim of the builders. Every architect knows how difficult it is to design and how much more difficult it is to cut all the hollow and curved mouldings which characterise every shaft and every mullion in the pure Gothic style, and how much its beauty depends on their delicacy and variety. Here, however, it is merely a square sinking, such as might be cut out of deal with a saw; and though it does produce a considerable effect at small cost, and is consistent with all the mouldings and mullions

of the style, it will not bear examination even when enriched and embossed, as it sometimes is, in pilasters and other features. Like all the other details of the age they never reach the elegance of the Classical and are immeasurably inferior to those of the Gothic style which preceded it.

Appreciation of Art.

There is in fact no more distinctive and vital characteristic of true art than its universality. Really creative power is neither for this time nor for that class, but for all time and for all classes—for the present as for the future, and for the future as for the present. The poet, the painter, the sculptor, the musician, the architect appeal in their highest efforts to sympathies, aggregate as well as individual. From this inherent condition of universality in all great works of art emanate three especial bonds of union and affection—firstly, between genius and the world at large; secondly, between genius and all who, however devoid of it, may be endeavouring to achieve success in the same department of art, and thirdly, between genius and kindred spirits of all ages, who in pursuits of the most widely differing natures have reared their heads aloft above the average of mortality, and won admission to the noble brotherhood whose names have become landmarks in the history of civilisation. In the death of every great artist these bonds receive a sudden shock, which, however it may jar and strain, can never break them. There can be no higher tribute to the ascendancy of genius than this impotence of death itself to finally sever bonds of union between mind and mind, which it can only shatter, and it is the very measure of this impotence which affords the best scale for ascertaining the nature, force and amount of the loftiest order of human creative power.

Colour in Painting.

In his fourth discourse Reynolds appears to consider colour as a merely sensual element of art. It is certainly no more so in the common and gross meaning of the word than form or light and shade. All these may be equally used to render subjects that appeal to our lowest passions attractive, and for this end Correggio has availed himself more of light and shade than of colour. Errors of this kind arise from confounding the art with the subject, and it is one of the first things necessary that the student should keep these entirely distinct in his mind. If he hopes to benefit substantially by the study of art, he must learn to see that qualities have often no necessary connection whatever which are nevertheless inseparably united in particular styles, as, for instance, the grossness of form in Rubens with his manner of composition or with the hues of his flesh, or the *chiaroscuro* of Rembrandt, the simplicity and truth of his expression, with the deformity and meanness so often found among his groups. But colour has been considered sensual, according to another meaning of the word, as addressing itself to the eye only, and not to the mind. This, however, like the first objection, applies no more to colour exclusively than to any other quality of art. Beauty of form or truth of light and shadow address themselves as much to the eye and no more to the mind and colour unless they express a sentiment, and colour may appeal to the mind as powerfully as either, particularly in the expressions of gaiety, of sadness, or of solemnity. Sir Joshua seems also to rate colour too much as a merely ornamental quality; but every part of the art is ornamental, and if colour be more so in some schools than in others, it is only because it is truer in those schools to nature. We must not confound the materials the Venetian painters introduced into their pictures with the media of their art—the effects of their rich velvets, satins, brocades, &c., with those beauties of nature, her brightness, splendour and harmony of tone, which they first gave in perfection, and which might as well adorn the poorest and coarsest materials as the richest. It is not that Paul Veronese is gayer in colour than Raphael, but he is truer, and seems completely to have attained that which Raphael aimed at in nearly all his subjects, namely, the broad light of tranquil midday. The most solemn, the most mournful tones, and tones suited to the most sublime subjects, may be found in the works of Titian, of Tintoretto, and even of Paul Veronese, as well as colour the most magnificent; but the distinguishing excellence of the Venetian and of the Dutch and Flemish schools is that, whatever be the choice of colours—whether the tints be brilliant, rich, or negative—whether the effects be light or dark—the true tone of nature is spread over the whole. Till a finer tone be discovered, I can never think that Venetian or Dutch colour can do otherwise than exalt the highest subjects; and it seems, therefore, to me a most injurious error for painters to think of colour as a thing that may be either neglected as a minor excellence, or deliberately rejected as inconsistent with other qualities. Such may be a convenient mode of thinking, but it never was the way in which any really great painter ever thought or felt; and it is curious to see in the writings of Reynolds his natural love of colour breaking out in detached passages, and confuting his own theory of the incompatibility of the excellences of the Venetian

of Dutch with those of the Roman schools. He admits in one place that the colour of Titian might assimilate with the grandest subjects, and in another he says, "Jan Steen had a fine manly style of painting that might become even the design of Raphael."

Prehistoric Periods.

According to Dr. John Evans the Iron Age in Western Europe lasted until about the Christian era, and in Britain the Bronze Age may have extended from about 1400 or 1200 B.C. to 500 or 400 B.C., and the Neolithic period for about 2,000 or more years previously. But in this country it is not possible to fix precise limits for those (to us prehistoric) periods. In Neolithic times the only metal known was gold. Later on the prevalence of implements and weapons of bronze before those of iron in this country, as in other parts of Western Europe, is remarkable. Bronze or gun-metal is an alloy in the proportion of nine parts of copper and one of tin, and copper was the first metal which became of real importance to man. Tin also early attracted notice, probably on account of the great heaviness of its ores, and when metals were very scarce it would naturally sometimes happen that, in order to make up the necessary quantity some of tin would be added to copper, or *vice versa*. In this way Sir John Lubbock accounts for the early use of bronze. In these later prehistoric times we had dwellings like those of the Swiss lake population, as at Barton Mere, in Suffolk, and at Ulrome, in Holderness. We have also the pit dwellings, such as those of Standlake, west of Oxford, of which pits a model is preserved in the Ashmolean Museum, but many of the so-called pit dwellings are in reality excavations made for stone or gravel. The Deneholes and the Beehive pits or granaries on Portland are not without geological interest, although their precise age is uncertain. We have the Druidical remains of Avebury and those of Stonehenge, which are referred to the later part of the Bronze Age.

Greek Myths and Greek Art.

The interpretation of the motive and meaning of Greek art is essential not only to the understanding of the art itself, but also to the due appreciation of the Greek mind. What is commonly called mythology or the tradition of the myth, as recorded and interpreted in Greek literature, appears to ordinary minds but as darkness visible, an image distorted by the various media through which it is conveyed; but the traditions of the same myth in contemporary art, which we may call mythography, enables us to trace out far more clearly and readily the expression of popular faith before a rationalistic philosophy had refined away its essence. Without mythography, as it is conceived, we cannot understand mythology. The monuments of art which archæology has collected acquaint us with the mythography of many races, and thus through the comparison of visible objects made by the eye, enable us to compare that which is matter of thought, the religious idea conveyed in this sensuous form. If we pass from the Elgin to the Egyptian Room in the British Museum, we feel a contrast, a difference, not of forms merely, but of the thoughts suggested to us by those forms. To account for this difference we must not only compare the two races by whom these two styles were produced in regard to their original character and habits of thought, but recur to the primary sources of mythology itself. The earliest religious and philosophical teaching in Pagan races generally was conveyed in the figurative expression of art and poetry, not so much from choice as necessity, from the imperfect development of conventional language and writing. The process by which the myth was thus, as it were, self-engendered out of the natural wants and questionings of primeval man was probably common to Pagan races generally. Its subsequent development was affected very variously according to the mental qualities, climate and external circumstances of the different nations, and it is thus that the myth as represented in their art and literature becomes a standard by which we may measure their relative mental capacities and intellectual progress. The Greek myth, as it underwent the plastic influence of the poet and the artist, became a beautiful work of the imagination—a bond of sympathy between the Greek and all future civilised races. The myth of the Egyptians, Assyrians and other less favoured races, remained as it was from the first, the monstrous creation of a fancy unrefined by culture. It was the free and vigorous growth of art and poetry that emancipated the Greek myth from the thralldom of prescribed forms; it was the inborn sense of beauty and fitness in the Greek mind that in the construction of their mythic types rejected, with a few exceptions, those combinations which nothing but long association can make pleasing to the sight or the mind. As Greek poetry and art grew up independent of all such influence as checked the growth of the Egyptian mind, the myth lost a hieratic and assumed a popular form. When once permanently recorded in sculpture and written poetry, it unconsciously underwent modifications not suggested by religious feeling but imposed to meet the conditions of art. As we trace the history of the myth, these its modifications from external influences become more complicated. Poetry suggests

new varieties to the artist, art to the poet; mythography and mythology react on each other, the figurative language of both becomes more subtle and expresses fewer intellectual distinctions. As mirrors multiply light, so is the natural fertility of the Greek imagination quickened by these mutual reflections of its art and poetry. Types breed and increase, the love of novelty demands new combinations, and, as imagination becomes exhausted in the supply, these are sought for in the types of exotic deities introduced by commerce or conquest, or in the revival of archaic and forgotten myths. The tradition of the myth subjected generally to these modifying influences of art and poetry was further changed by transplantation into different localities. The isolation and unwillingness to centralise, which is the characteristic of the Greek communities, led to endless local varieties in the common myth—differences which are as peculiar dialects in the figurative language of ancient religious teaching. Again the exotic influences which must have been more or less in action from the first become very apparent after the conquest of Alexander in the fusion of Greek with foreign types of divinities, the result of the blending of races in the kingdoms formed by that monarch's successors. This led rapidly to the motley pantheism of the Roman empire. In the art of the Augustan age and subsequently we find many examples of these combinations in mythography, sometimes treated with exquisite skill, as in the blended types of Bacchus and Cupid—sometimes monstrous anomalies, as in the well-known Diana of Ephesus.

Pictorial Perspective.

There are two things to be looked for in books of perspective, but which are rarely seen in modern works. The first is:—Given the position of a point in space, required the position of that point on the picture. The second is this:—Given the proportions of the parts of a line in the picture, required the proportions of the parts of the original line, or *vice versa*. Suppose the picture is placed, and the eye of the spectator, and the point to be transferred to the picture. To know this point we must know three things. First, the perpendicular distance; that is to say, the distance which the spectator must travel right onwards on a line perpendicular to the picture, in order to have the given point on his right or left hand. Secondly, the off-set, as we shall call it; that is, the distance right or left which he must then travel in order to arrive under or over the point. Thirdly, the height or depth of the point above the eye. To lay down the point on the picture, proceed as follows:—Let the distance of the eye from the picture be made the representative of the perpendicular distance of the given point. On that scale set off a representation of the off-set to the right or left of the centre of the picture. Then set off, on the same scale, a representation of the height or depth of the point, upwards or downwards from the end of the off-set just laid down. For example, the perpendicular distance of a peak from the eye is 10 miles; its off-set is 5 miles to the right; its height above the eye is 3 miles. The distance of the eye from the picture is represented by 20 inches. If 20 inches represents 10 miles, then 10 inches represent 5 miles, and 6 inches represent 3 miles. Set off 10 inches to the right from the point of the picture opposite to the eye, and then 6 inches upwards. The upper end of the 6 inches is the position of the peak on the picture. The demonstration is as follows:—Suppose the picture moved backwards away from the spectator, enlarging as it goes, until it passes through the very point to be laid down. This point is then its own picture, and its perpendicular distance is the distance of the picture from the eye, while the off-set and height on the picture are the real ones. Now bring the picture back again, contracting as it returns, and by the time the real perpendicular distance has been shortened into the intended picture-distance the off-set and height will have been proportionally shortened, and will of course become the picture off-set and the picture-height. Now to the second point. If any number of lines be in one plane their vanishing points are all in one line, namely, the vanishing line of that plane. And if a line in the plane be parallel to the picture its vanishing point is infinitely distant, and the picture proportions for that line are the same as in the original. On these two things the whole depends. Take the given line, in which are parts AB, BC, CD, in any number we please; let the vanishing point be V. From A draw any line at pleasure, and take on it a point W for its vanishing point. Then VAW represents an infinitely extended triangle, to the plane of which VW is the vanishing line. Through either of the points, say D, draw a parallel to VW, cutting AW in E. Then DE has for its original a line parallel to the picture. Draw WB, WC, cutting ED in b, c. These last-drawn lines have originals parallel to that of AE, whence the originals of AB, BC, CD are proportional to the originals of Eb, bc, cd—that is, seeing that ED is parallel to its original, to Eb, bc, cd themselves. Hence the originals of AB, BC, CD are in the proportions of Eb, bc, cd. From this anyone may invent the construction necessary for dividing any line perspectively into parts of any proportion.

NOTES AND COMMENTS.

THE alteration of the Brighton Town Hall has become a necessity that can no longer be put off. The subject has been under consideration for the last twelve years, but the inconvenience of the building is almost unbearable. It will be necessary to rearrange all the offices and provide ample and suitable accommodation, to provide additional committee-rooms, to enlarge the Council chamber, and to provide suitable ante-rooms. The cost is estimated at 20,500*l*. It is also necessary to erect new buildings for police courts and offices, which will cost 24,000*l*., a fire-brigade station costing 2,500*l*., and buildings for a retail flower and fruit market, amounting to 6,500*l*. Altogether the expense on building will be 53,500*l*.

THE Stadthuis, or townhall, of Louvain is one of those buildings that is accepted as exemplifying the poetry of Gothic architecture. It was commenced in 1448, and the exterior was completed in eleven years. The designer was MATHIEU DE LAYENS, whose plans were modified by GILLES PAUWELS. The building seems like a simple cubic block that was made a thing of beauty through the influence of the sculptor's art. Although without a tower and of moderate dimensions it is a worthy rival of any of the Belgian townhalls. It is impossible to have so much delicate carving as appears on the exposed faces in a continuous state of perfection. About sixty years ago a restoration was undertaken, and it is not easy to discern between the new work and the old; both are now in a corresponding state of decay. Without its townhall Louvain would not have much interest for the world, and therefore the municipality have decided on a costly reparation. There is no use in hoping that a conservative policy will be adopted by those who direct the works, for the fifteenth century work may be said to have vanished. That so much picturesqueness has survived in spite of renewals suggests the spirit of the original design.

THE Italian engineer, ENEA LANFRANCONI, who was associated with the improvement of the Danube, and who lately committed suicide at Pressburg, was an enthusiastic collector. He possessed about 14,000 prints, and sketches of which 5,000 were by Hungarian artists. His library contained over 3,000 works, most of them illustrated, and all of great rarity. There are also about 300 paintings, including examples of the Italian, Spanish, French, Flemish and Dutch schools.

MUCH remains to be done before the humbler classes of the population can be persuaded that glaring chromo-prints, which a South Sea Islander would scorn, are not the best adornments for their homes. A lecture on the subject was lately delivered by Mr. L. R. CROSSKEY, in which he stated that benevolent people seemed to forget that there was a legitimate demand on the part of the people for pictorial work and ornament at prices within their means. By means of mechanical processes works of art could be made known and familiar to the great struggling mass of humanity, and their art instincts cultivated by the dissemination of art work—not, indeed, of the highest artistic form, yet of a sound and healthy character. There was, he asserted, a general timidity in artistic circles to countenance any work in which mechanical methods of an economic character were employed for the purpose of meeting popular demands. He advocated the establishment of technical art schools distinct and apart from schools of art, the work of these schools to be mainly in giving a knowledge of the various methods of reproduction and the general principles that govern the technicalities of a trade, and the art instruction to bear directly upon the requirements of particular art industries. He described a school which had been founded on these lines by the governors of the Glasgow and West of Scotland Technical College in response to an appeal made by several trade

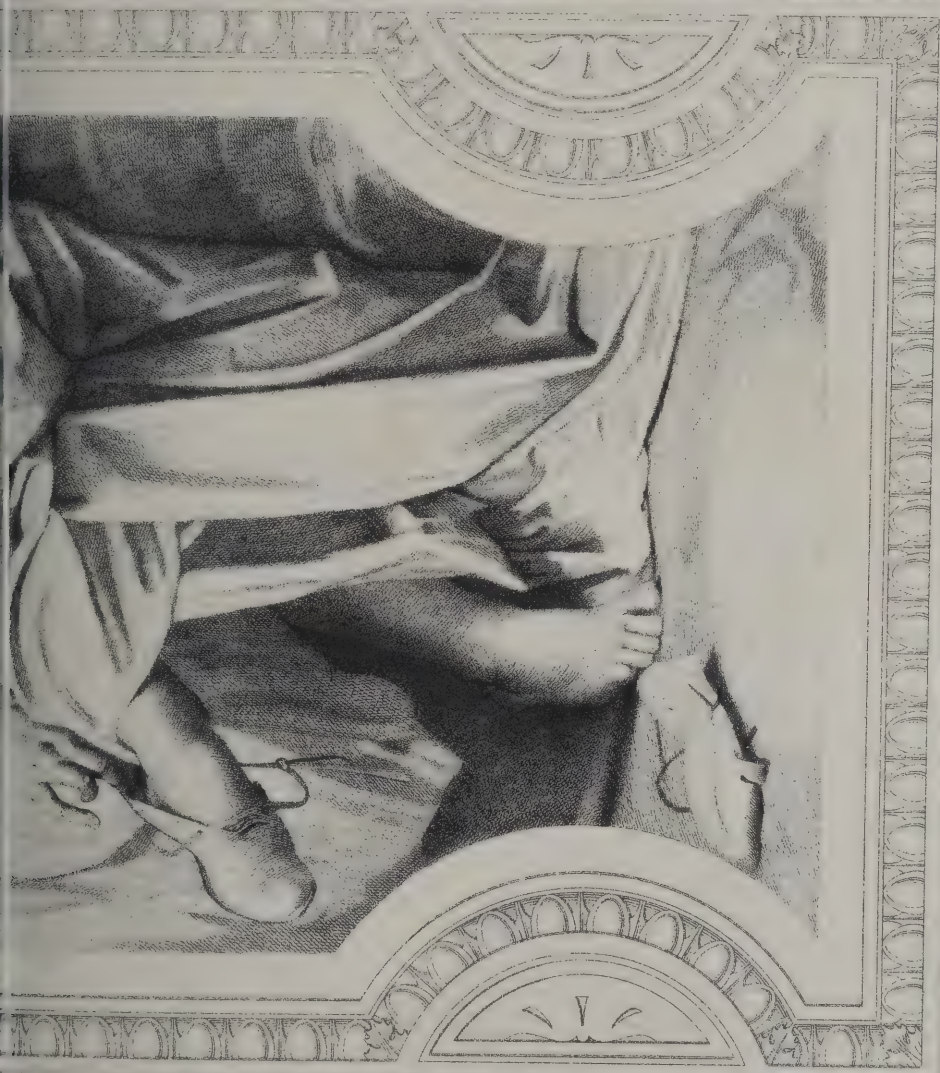
organisations. It was established in a small and tentative manner, and had now reached its third session, with over 300 enrolments and a teaching staff of nearly twenty masters. This rapid and extraordinary development showed clearly that there was an eager demand among artisans for this class of instruction. In conclusion, Mr. CROSSKEY said that in spite of free picture galleries, schools of art and art lectures, the gaudy grocers' chromo-lithograph and German print would still occupy places of honour on the walls of the artisan's house, and would continue to do so until the artistic talent of the country was in a position to acquire and use the technical knowledge necessary for making their designs applicable for the varied mechanical methods of reproduction.

THE sixth edition of Professor BANISTER FLETCHER'S "Quantities" (B. T. BATSFORD) is very much larger in size than its predecessors, for there are in it 430 pages. Additional drawings are also introduced. Among the additions are plans and materials to exemplify "the complete taking off in all trades, the abstracting of the various items in the various trades, and the complete bill." Any student who is not able to understand the routine of a surveyor's duty with such precedents before him must be a dullard, and had better seek another occupation. Messrs. LONGMANS, GREEN & CO. have brought out a new edition of the "Treatise on Electrical Engineering for Electric-Light Artisans and Students," by Messrs. W. SLINGO and A. BROOKER. The book was prepared for students of the City and Guilds of London Institute, but it can be useful to a larger number of people. From the excellent arrangement and clear explanations a single perusal of the volume will give a better notion of the theory and practice of lighting than a long study of some other books on the subject. A "Science and Art Series" is being published by Messrs. CHAPMAN & HALL, Limited. One of the latest volumes is a key to examinations in "Machine Construction and Drawing," by Mr. HENRY ADAMS, who is content to give students the benefit of his experience as an engineer. A companion work on "Practical and Plane Geometry" has been prepared by Mr. HENRY ANGELL. The examinations of the Science and Art Department must be deprived of their terrors for novices by cribs of the sort; whether they are as advantageous for the students we need not discuss. As long as they help to increase the number of "passes" the authorities of the Department must approve of them, and hence, we suppose, they are issued by the official publishers. But would it not save trouble and advance the interests of the Department if the examination papers were published some months in advance? Whatever kind of book is studied, a good English dictionary should be found beside the reader. Messrs. BLACKIE have published a new edition of their "Student's Dictionary," which for quality and cost is unparalleled. Their dictionaries have long ago gained approval by their accuracy, and in the latest example we have about 800 well-printed pages with wood-cuts for a few shillings. Unlike the majority of works of the class, this edition presents definitions of architectural details which are correct.

ONE of the pictures which will give interest to the next Salon exhibition will be that by M. JEAN PAUL LAURENS, with the following long title:—*The Inhabitants of Toulouse, after the First Siege, sustained against Simon de Montfort, Rebuilding the Walls of the City which had been Demolished by the Enemy.* The work measures about 29 feet by 23 feet, and is to be placed in the Hôtel-de-Ville, Toulouse. The picture will not only have interest, like all the works of the artist, from its composition, but on account of its execution. It is in distemper, which it is needless to say is the most ancient form of painting. As old HAYDOCKE says, "In distempour the colours are ground with water and grounde with glew, size or gummess of diverse sortes." M. JEAN PAUL LAURENS'S works in oils have been rather sombre, let us hope a change will take place in his works in tempera. In order to gain effect he has employed in places a sponge to lay on the colours instead of a pencil.

Lehrer. Architekt. Mar. 22nd 1895.





TERPSICHORE

The Architect, Mar. 22nd 1895.



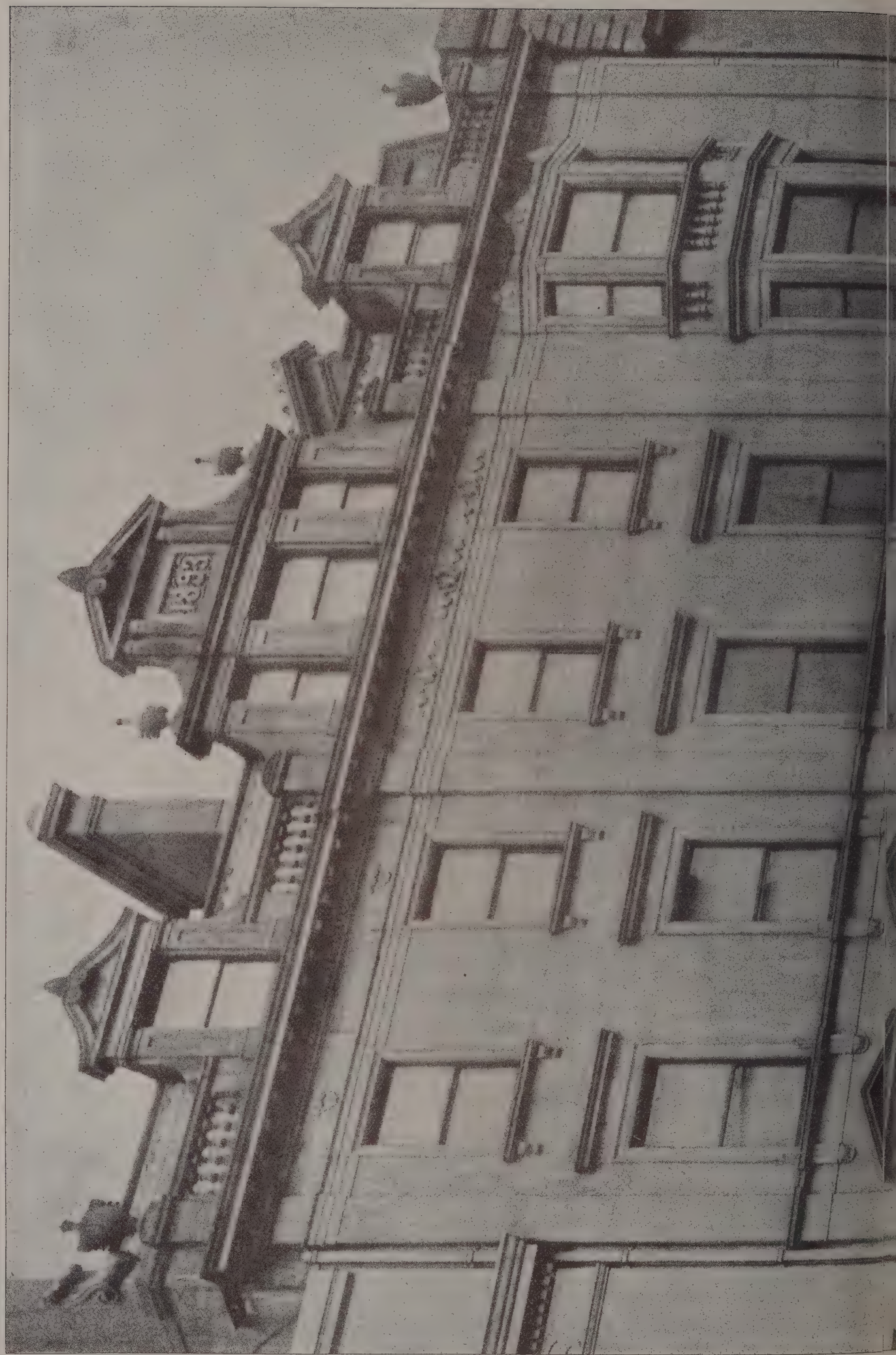


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NATIONAL PROVINCIAL BANK OF ENGLAND, PICCADILLY.
A. WATERHOUSE, R.A., Architect.

The Architect, Mar. 22nd 1895.



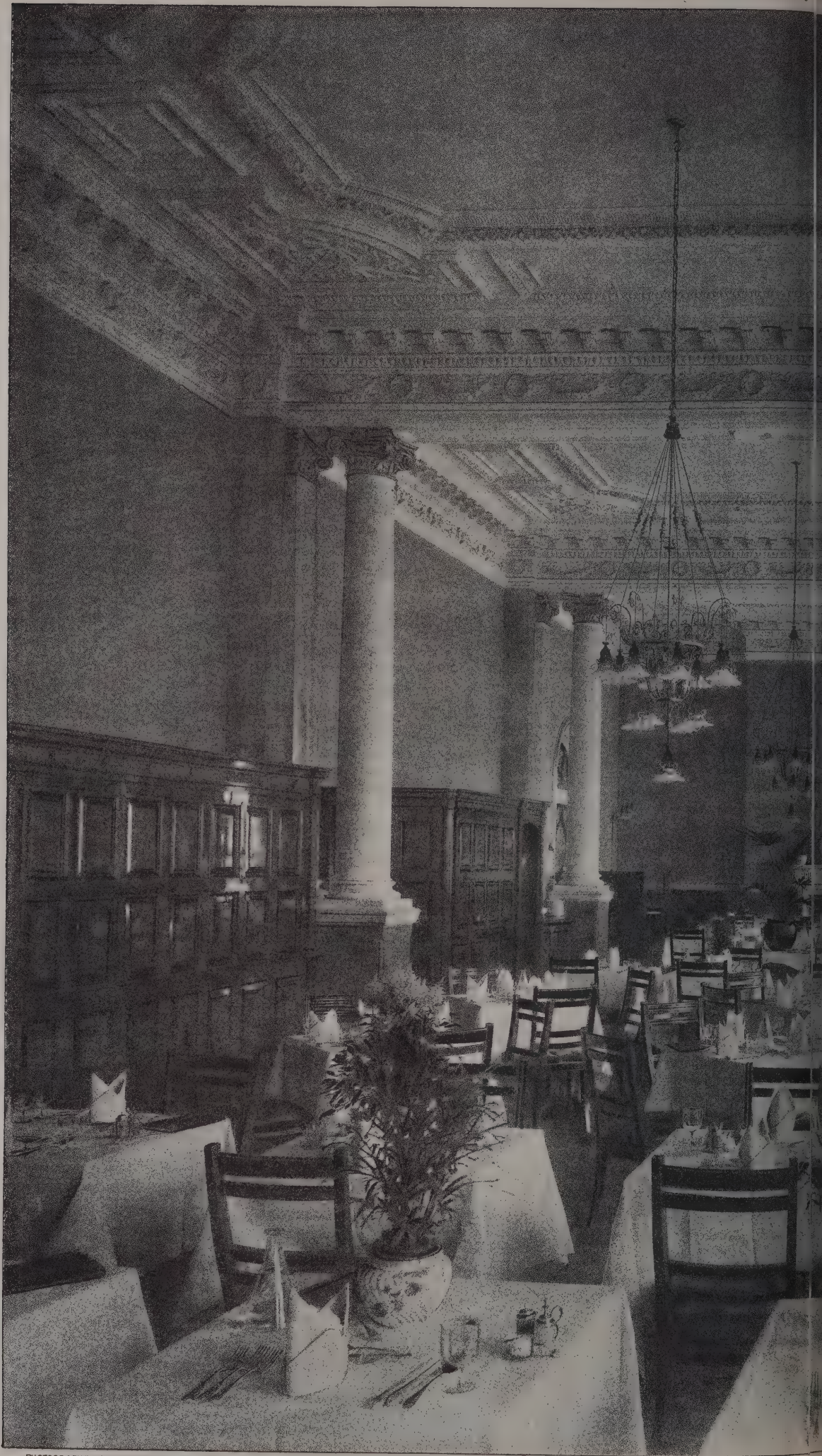


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WILLIAMS, DEACON AND MANCHESTER AND SALFORD BANK, PALL MALL.

W. W. GWYHER, Architect.



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ILLUSTRATIONS.

TERPSICHOIRE.

NATIONAL PROVINCIAL BANK OF ENGLAND, PICCADILLY.

WILLIAMS, DEACON AND MANCHESTER AND SALFORD BANK,
FALL MALL.

DINING ROOM, JUNIOR CONSTITUTIONAL CLUB, PICCADILLY.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association took place on Friday evening, Mr. E. W. Mountford in the chair. Mr. SINGER read a paper on

Brass and Iron.

Mr. SINGER, in the course of it, said:—Wrought-iron is almost the only metal that can be welded together, which means that when brought to nearly a melting-point, which is known by the sparks coming from the fire, and after some silver sand has been thrown in the fire to prevent oxidation from the air coming to it, by great quickness of action the two parts are brought together, and by smart hammering they become united in one solid piece. For this process three things are necessary, good iron, good clean coal and a skilful and quick workman. For fine work our anvils are put quite close to the forge, as small fine work cools even in the transit of a few inches.

It is this quality which gives to wrought-iron its great charm as a metal for ornamental work, a charm that is all its own, and enables the smith to produce work which can be carried out in no other metal. No metal so repays a skilful workman as wrought-iron, and in no other material is, I think, the distinction so evident as the stamp left upon it of good or bad treatment. The smith must model his forms while the iron is hot, and no amount of after-cutting and filing will produce that free and artistic feeling with which a good workman impresses his work.

There are many varieties in even the subdivision of wrought-iron, the merchant from whom we purchase this metal having on his list eight sorts of wrought and fourteen kinds of steel, the wrought-iron varying from 6½ 1cs. up to 22½ a ton, the steel running from 12½ to 68½ a ton. Each of these would have a different brand or mark, each of the varieties being the production of a special firm.

To insure good iron being used it would be well for every architect to know the hieroglyphics on it, as the appearance of bars at 6½ 1cs. a ton is much the same as that costing three times the amount. Thus the cheapest iron is Welsh, having "A" and a crown impressed on the bars; the next is that having "N H & S" with a crown, this being Staffordshire, costing 7½ 5s. a ton; the next quality has Netherton Best, with a crown between the words; after this, comes the old brand of "B. B. H.," this is 8½ 1cs. a ton. "S. C.," with a crown, is very fine iron at 10½ 1cs. a ton; charcoal iron has the letter "L" in a circle, this being 17½ a ton, and is used for cylinders, boiler-plates and engine-iron, where great tenacity is required.

The subject of the value of iron for constructional purposes is beyond the scope of my paper. In this capacity it forms part of the anatomy of architecture, with which you are only too well acquainted.

I cannot speak with enthusiasm of the examples where it has been used by itself and for itself, such as the well of Quentin Matsys, all such having a tendency, in my opinion, to look meagre and poverty-stricken. It is where it plays a more unassuming but useful rôle as an accessory or adjunct to a building that it finds its best expression. Within this limitation quite enough field is left to tax all the energies of the metal-worker. Its strength, durability (if properly treated) and the way that it lends itself to every method of manipulation are the qualities that specially commend iron for application in connection with architecture, for screens, grilles, gates, lighting purposes, door fittings, &c. Very numerous are the other uses for ironwork in a building, and quite equal in number are the possibilities in the way of decoration, and I think it will be admitted that when treated by a master hand the metal never looks obtrusive or vulgar, but that it gives additional value and interest to the old work. In door fittings, for example, what force and vitality there are in some of the old hinges, from the almost plain strap, with its few vigorous marks, to the forged and chiselled masterpieces of the twelfth, thirteenth and fourteenth centuries. Possibly our modern smiths will never excel them.

I venture to hope, however, that in another branch, namely, screens, we may yet make some advance. The old smiths laboured under some disadvantages in this respect compared with ourselves. They had no machinery as we have for producing bars of all shapes and sizes, or sheets of every thickness

and dimension. Thus for large screens they had to fall back upon wood and stone. I do not wish to decry either material for this purpose, but I think there are often occasions when a screening off is necessary without obstruction of light or division of the perspective of the building. Then I venture to say that iron is essentially the material for the purpose. Screens may be made to exhaust all the resources of the metal-worker—forging, chiselling, piercing, repoussé work, enamel and addition of various metals, mouldings of all sections, and tracery, scrolls, and leaf-work of every kind. I need not mention that several eminent architects have drawn attention to this interesting subject, and I little doubt that it will receive still more in the future. Iron has found its last and not least appropriate application in connection with the electric light. I fancy the artists of the Middle Ages and the Renaissance would have fairly revelled in the various treatments suggested by this triumph of science. The delicate treatment that this mode of lighting seems to demand from its very nature, needing no tubes and very little support, is just the scope that calls for the playful display of fine wrought-iron work. I often think we are too serious in our ornament, and give it too laboured an effect, as if it had been designed and wrought after most painful and serious consideration.

There are several features that should make us hopeful of the future of ironwork in this country, namely, the attention now given it by architects, also the help now rendered it by science, so that good iron and steel can always be obtained with care in selection. I think I am also justified in saying that many of our smiths have attained a wonderful amount of skill. No doubt what we most lack is the taste, or instinct, for what is within the power of the material. Also probably we are only gradually learning how much of the work should be done within the glare of the smith's fire, and how careful one has to be not to take the life out of the work afterwards. One great evil we have to contend against is the hurry and drive of the present day, which does not always leave the worker time to work with all the loving elaboration as of old. But when all is said that can be against the present condition of things, I still think that we ought to be in a condition to produce ironwork in harmony with the best architectural products of the epoch.

I must now say a few words upon the subject of brass. From an artistic point of view this metal does not hold so high a position as bronze, as it is inferior to the latter in many important qualities. Its colour is not so good, its contraction in casting is greater, and in a molten state it does not run so freely into the mould; also it is not so satisfactory a metal for the chaser to manipulate. Still, it is the better known and most-used metal of the two, one reason being doubtless that it is cheaper, unfortunately a most important consideration in these days. Bronze is the metal in which the sculptor usually reproduces his work in metallic form; brass, on the other hand, being the metal we see around us in the numerous objects of everyday use.

Brass is a compound alloy of the two metals copper and zinc, bronze being an alloy of copper and tin; and it is difficult in any historical account of these metals to distinguish clearly, which is intended in any earlier mention of brass than 1721, when zinc was discovered, or rather produced by Henckels, as a commercial metal. But the word brass has been used far longer than this idea of the metal as is now understood by that term, and the name for it has been supposed to come from the Spanish word "brasas," meaning the colour of flame, our word "brazen," with its many meanings, no doubt being derived from the glaring appearance of the polished metal. This metal differs greatly in its history from iron, as casting in the latter has been the last development of its use and application, whereas with brass and bronze that was the first form as to the employment of these alloys, and all the earliest finds are the result of casting as the most ready application for their use, and the prehistoric nations made beautiful castings in bronze, whereas iron was known for over three thousand years before Europeans could succeed in casting it in a fluid state.

That it may be seen how difficult it was to produce large pieces of so-called brass, I may mention that up to the fifteenth century it was found impossible to make a piece of metal which could be hammered out as sheet brass beyond about 2 feet square, whereas now it can be had 20 feet long, but even at this late date the metal was more bronze than brass, from its having tin in its composition. This will be seen from the colour of the piece of metal I can show you, and which I have had polished so that its red colour may be seen.

It may here be noted that a little confusion has been caused by some workers of the present day terming the metal in which they engrave memorial tablets "latten brass." This, of course, is a misnomer, as it is merely a repetition of the same word in two languages, as the old French word for brass was "laiton." The metal was so costly that in the sixteenth century they often destroyed earlier memorial brasses by turning them round and cutting the new designs on the back of the older ones.

Brass-work, strictly so called, was not attempted in England before the time of Henry VII., and the railing round his tomb in Westminster Abbey was soon after made, the trade getting general in the time of Elizabeth, who encouraged workmen from the Low Countries to come to England. Yet in 1649 some large works established at Esher, in Surrey, proved a failure, ending in ruin to the founder. The next attempt was in 1678, when the Prince Rupert Mills were started. Then came some works at Hackney, called the Temple Water Mill Works, water being used to drive the hammer, this being before rolls were invented. Up to this time brass was only produced by using calomine and melting copper with it, but in 1721 pure zinc was produced, and great changes took place soon after in the manufacture of brass.

As already stated, this metal is a mixture of copper and zinc, and these are run together in a state of fusion in various proportions, to form the many kinds of brass that are needed—copper being the chief part of the alloy. The Japanese are said to have 200 varieties of these alloys, according to the colour they desire in the finished metal.

The zinc group gives 5 parts copper to 1 of zinc to obtain rich sheet brass; 4 parts copper to 1 of zinc for pinchbeck brass; 3 parts of copper to 1 of zinc for Dutch metal; 2 parts copper to 1 of zinc for ordinary yellow brass; 1.75 parts copper to 1 of zinc for pale brass; 1.25 parts copper to 1 of zinc for dipping brass; 1 part copper to 1 of zinc for hard solder, it being understood that the more zinc is used for the alloy the cheaper is the metal produced, and the less durable it becomes.

Although my remarks are upon brass, it may be well to give the alloy of copper with tin, *i.e.* bronze, as these metals are so closely allied. 20 parts copper with 1 of tin gives a rich red metal; 10 parts copper with 1 of tin gives the best form of bronze; 4 parts copper with 1 of tin gives bell-bronze, which is brittle, and unfit for any other use. The best metal for taps, cocks, &c., is composed of 4 parts copper, 1 lead, 1 zinc and $\frac{1}{2}$ of tin. Up to a late period of the last century the manufacture of brass was a slow and tedious process, taking at least twenty-four hours, as they used the carbonate of zinc, or calamine, with the copper, in taking that time to reduce the ore and unite with the copper; but now that the metal zinc can be obtained in a pure state the process can be completed in about an hour, for as soon as the copper is melted the zinc is then added, either in a molten state, or is plunged down to the bottom of the molten copper, and then well stirred, or in the casting the zinc, being the lighter metal, will be found too much in the upper part of the casting.

Any of the above alloys can be easily cast, but no ornamental work or any object—excepting plain block ingot can be cast in copper alone, the contraction of this metal in its pure form being so great that, when cooling from the molten state, it pulls itself to pieces when anything prevents that contraction. The difficulty attending contraction will be seen when I mention that the base of the statue of Lord Napier contracted just over 1 inch, and if provision had not been made for this, this mass of metal, weighing nearly half a ton, would have pulled itself to pieces in cooling.

The Chinese have a clever method of reducing the effects of contraction as much as possible, by making the flask in which the casting takes place to contract in an equal degree with the molten metal, thus keeping the mould close to the metal, and by this means getting a sharper result.

Brass is very tenacious, but it has this defect, that if the tension is continued, a singular molecular change takes place, rendering it rotten and most unfitted to support any heavy weight. This fact was evidently known to the brass-workers of the sixteenth and seventeenth centuries, for it will be noticed that they never used brass to suspend the large brass chandeliers made about that date and so often seen in our churches, but invariably used iron rods. It has been said by an authority that every brass pendant hung by means of brass supports will drop within fifty years. This may be an exaggeration, but brass is not a suitable material for the support of any heavy object.

Brass is the metal in which a very large proportion of what is known as objects of applied art are now produced, bronze being retained for fine art. And to bring it into suitable shapes, brass is cast, drawn into round wire, flat strips, hollow tubes, and rolled into sheets, and in these various forms easily lends itself to the manipulation of the workman.

There is now no time to more than just refer to the long series of operations through which this metal passes in its many different modes of treatment. Thus in a molten state it is cast into suitable forms moulded in sand. The model from which the mould is made may be either carved in wood or modelled in clay. The castings, according to their shape and the object for which they are required, are either turned in a lathe or are chased. Brass is also beaten into form or embossed, bent into scrolls of various kinds, when in the shape of strip brass, and also there is the large subdivision of engraved work.

Mention should also be made of the process known as

spinning. The form of the object that is to be spun is first made in either hard wood, or if a great number of the article is required it is made in metal. This form, which is termed a chuck, is put in a lathe, and against it is fixed a brass disc. The lathe is then put into rapid motion, and various steel tools of different shapes pressed with considerable force against the disc, beginning in the centre and gradually working outwards as the metal yields to the pressure and takes the form of the model. It is a very interesting process, and astonishing how quickly a good workman can spin a number of forms, which, if they had to be hammered up, would entail much time and labour.

Brass is also used for repoussé work, and this process is perhaps the one that requires the most highly skilled and artistic treatment of any through which the metal passes. It is not quite such a suitable metal for this purpose as copper, as it is not so soft and cannot be stretched so easily without cracking, but this method of execution has been, and still is, very generally employed for converting this metal into ornamental forms, the processional crosses on the table being interesting examples of the application of repoussé work.

After brass has been treated in one or other of these processes it is either polished or dipped in an acid solution and burnished, to give the metal its bright yellow colour, with which we are so well accustomed.

As brass cannot be welded like iron another mode of attaching the various parts of a piece of work has to be adopted, and as may be imagined from the general use of this metal for the manufacture of ornamental forms, this process, which is known as soldering, is not a difficult one. The two surfaces are united by the application of sufficient heat to melt a more fusible and baser metal which is introduced between them, and which combines with both and firmly unites the two parts.

It will thus be seen that many industries throughout the country are the result of the many processes through which this metal passes before it comes before us in the form of, say, a lectern or an altar-cross for our church, a gas-bracket or an electrolier to light our room, a door-handle or a fender, and perhaps no metal has a more universal application, as it is used for almost every form of ornament needed in metal for either ecclesiastical or domestic purposes.

As brass is a metal that easily tarnishes, it has been found necessary to coat it with a thin substance to preserve it from the effect of the atmosphere. This is termed lacquer, and is a thin, transparent varnish put on the metal when hot. If the object could be kept from moisture being deposited upon it, and be occasionally wiped over, there would be no need of its being lacquered, but as this does not seem possible the work is usually lacquered, and not always with satisfactory results, for you must often have noticed the dark streaks upon memorial brasses, the reason being that generally such work is in a church, of which the heat is only raised on the Sunday. The air then gets warm much sooner than the brass, which is on a cold wall, the wall taking a long time to get its temperature raised, and during this time the moisture is deposited on the brass. This cannot be absorbed as on the surface of the walls, and the moisture runs down the brass, producing streaks on the metal, which are caused by the lacquer being destroyed by the damp. The better plan, I think, is not to lacquer a memorial brass, for it should not be difficult to find willing hands who about once a month will give such work a few minutes' attention, and this would be sufficient to keep the metal a good colour.

It is a question if it would not be desirable to make a larger use of bronze in preference to brass. I confess that for many purposes I consider the former the best metal. Thus, for work in churches, I think bronze the better material of the two. It is more durable, of a richer shade and it retains its colour much better, as brass so easily tarnishes on account of the zinc in its composition, and the difference between the cost of the two metals is really little; in fact, our firm is always willing to supply bronze at nearly the same price as may be quoted for brass. I believe in the future bronze will be much more generally used than it has been in the past.

The application of brass to architecture is not quite so direct as in the case of iron; as brass, being cleaner to handle, and no doubt also because of its colour and the facility of its manufacture, is more often used for movable pieces of furniture, such as lecterns, candlesticks, crosses, vases and numerous articles in daily use.

It is now recognised, however, that even a piece of furniture has its influence upon a building, and deserves and repays the architect's attention. It is admitted at the present day, however it may have been a few years ago, that it is hardly expedient to turn the architect out of the house as soon as the four walls are built.

Moreover, almost every fixture applicable for iron has also been made in brass, with more or less success, the adoption of the latter giving a more luxurious effect than the harder and less costly metal. We all know the rich appearance of the fine

old coronæ, with their little turrets and rich bands of ornament, which date back to very early times. Triumphs of art were the old brass shrines on which devout Christians lavished their best efforts, and although so elaborate, they do not give the idea of laborious execution, but almost spontaneous growth. Abroad I notice that brass altars have often been produced in recent times; they are very rich in workmanship, and may perhaps with advantage be adopted in this country. I think in the later French styles the glitter of the brass pendants and brackets greatly contributes to the very finished and furnished aspect of the period.

England is perhaps not so rich as some countries in examples of old brass-work, but there is a certain dignity of style about such as we have; for instance, the old brasses and lecterns, which have been revived with some success.

Mr. GARBUTT proposed a vote of thanks to Mr. Singer for his paper, and referred to the superiority of Oriental and Indian work, including Japanese work.

Mr. STOCKDALE, who seconded the vote of thanks, expressed his preference for brasswork rather than bronze.

Mr. SATCHELL regretted that so few members were present. He alluded to a difficulty, that lettering would not stand on bronze tablets used externally. A different treatment in two colours would render the lettering legible. Another question was that modern wrought ironwork did not hold its own against the old work.

The PRESIDENT said ironwork for screens was seldom satisfactory, and could not even feel satisfaction in some of the beautiful work designed by Mr. Pearson. To make use of it for grills good results could be obtained.

The PRESIDENT, having put the vote, it was carried by acclamation, and Mr. SINGER briefly responded.

Very few members were in attendance, a fact which the President called attention to, but did not give any reason for, though a reason was probably not wanting, as members of the Architectural Association enjoy no special immunity from colds and influenza.

THE WAVERLEY STATION HOTEL COMPETITION.

THE following is the full text of the remonstrance which Dr. R. Rowand Anderson has addressed to the Secretary of the North British Railway Company concerning the recent competition:—

16 Rutland Square, Edinburgh:
February 23, 1895.

Dear Sir,—I duly received your letter of the 19th, written in reply to mine of the 16th inst., and I have to express my regret that you have not replied to the question put in my letter.

In your letter of the 14th you stated that the designs for the proposed new hotel and offices at Waverley Station had that day been carefully considered by the directors, and you intimated their decision on the plans submitted. On the 16th I wrote you asking if the directors had the plans, sections, reports and estimates examined by experts before coming to a decision; and, in reply, you have referred me to the conditions set forth in your letter of October 26 last, under which various architects were invited to submit plans. It is needless to say that I had referred very carefully to that letter, which contained minute and particular directions requiring to be observed by the competitors as to the methods of arranging and placing the building, the height of the building at various points, provisions for communication between different sections of the building, and other very important matters affecting the designs. The letter of instructions stated that the directors should be the sole judges of the designs, but did not suggest that the directors were not to adopt the only possible methods of forming a judgment.

The circumstances connected with the competition and the decision of the directors have been so extraordinary, that I think an explanation is due alike to the competitors, the architectural profession and the public; and it was in the hope that some explanation would be offered that I addressed you on the 16th.

When architects enter into a competition they know that only one competitor can be successful, and I should never cavil at the result where the designs submitted receive adequate consideration and an honest attempt is made to do justice to the competitors. In the present case it is evident that these conditions have not been observed, and the competitors have the gravest cause of complaint against your directors. Apart from the competitor whose designs have been accepted, five architects of established reputation were invited to compete, and I am justified in saying that they all devoted much thought, labour and expense to the preparation of their plans. I devoted to the work my own time and the time of twelve assistants, working extra hours for eight weeks to the exclusion of other work, and I have no doubt the other competitors must have made

equal sacrifices. It was freely stated to myself and other that we might save ourselves the trouble of competing, as the result was a foregone conclusion; but I declined to believe that the directors of the North British Railway Company would ask professional men to give their time, skill and experience to the preparation of plans without the intention of dealing fairly with them in the award. It is now abundantly evident that the designs have not been carefully considered.

My plans were sent in only on the night of the 11th, and the decision was intimated on the 14th, on which day the designs were, as stated in your letter of that date, "carefully considered by the directors."

The directors had to examine and compare the elevations and plans of six sets of designs for a block of buildings to consist of a large hotel, railway offices and shops, requiring to be adapted to an exceptional site, and it was part of their duty to the competitors to take proper means of satisfying themselves that the different designs were in conformity with the instructions issued, and that the actual conditions as to available space, height and other important details were observed. In dealing with designs for a work of such magnitude, involving the consideration of the grouping and arrangement of hundreds of apartments, the directors ought, in ordinary course, to have had expert assistance and advice alike as to the more purely architectural quality of the designs and their practical adaptability to the purposes to which the buildings are intended to be put. The schemes of arrangement of the interiors alone (without speaking of the elevations) had taken weeks of thought and planning on the part of each competitor, and it was a matter of absolute physical impossibility for any one, even an expert, to master the details of the several schemes within the time that elapsed between the sending in of plans and the award.

By whatever process the decision of the directors was arrived at, it certainly was not reached by the only proper course of considering each set of plans in detail and comparing them with each other. Even if the directors were, unaided, competent to make such examination and comparison, it is quite evident that they did not attempt to do so.

As a practical man, acquainted with the difficulties of the task, I have no hesitation in saying that the directors, when they gave their decision, were necessarily ignorant of what they were dealing with beyond such vague ideas as they may have been able to form from a pictorial representation of the buildings, and I say that it is disgraceful to treat in such a way men who have attained a position in a honourable profession. The directors could have entrusted the work of designing the building to any person they pleased without going through the solemn farce of inviting competitive designs. Having invited competition they ought surely to have allowed a decent and sufficient interval for the adequate consideration of the designs to elapse before announcing their decision, instead of adding the insult of a public slight to the injury inflicted on the competitors, whose labour, thought, and outlay have been wasted.

The annals of architectural competition have many chapters of injustice, but I have never known of a competition conducted with such a contemptuous disregard of even the ordinary forms of fairness. I am quite aware that I lay myself open to cheap sneers about the disappointment of unsuccessful competitors, but I am satisfied that a piece of gross and wanton injustice has been perpetrated, and I shall not allow any fear of misrepresentation to deter me from offering my strong and earnest protest against what I consider injustice and insult to the architectural profession.

I request that you will submit this letter to your directors, and I remain, yours faithfully,

(Signed) R. ROWAND ANDERSON.

The Secretary, North British Railway Company.

THE ACOUSTICS OF BUILDINGS.

AT the recent convention of the Ontario Association of Architects the subject of acoustics was discussed. The *Canadian Architect* gives the following report of the conversation:—

The president, Mr. Edmund Burke, said one method he had found very effective was to have a flat wall behind the speaker. He had known instances where by reason of an octagon form behind the speaker the echo had been such that he could hardly be heard, and this was in a great measure remedied by cutting off the octagon.

Mr. Wickson inquired if there was not some theory about the ellipse being the most perfect form; he had been given to understand that it was, although he had not found any authority for the statement.

Commander Law remarked that the Mormon temple at Salt Lake City, Utah, was said to be almost perfect in its acoustic properties, and was shaped like half an egg.

Mr. Edwards added that the form of the pavilion at Grimsby Park was suggested by the Mormon temple referred to by

Commander Law, but although, as that gentleman had said, the Salt Lake building was believed to be acoustically the most perfect on the continent, the Grimsby imitation bore the reputation of being the very worst in that respect.

Mr. Wickens said he had heard it remarked by a musician that any building which was good to speak in was poor to sing in. It seemed almost universal that a church or any building which pleased singers was not one that pleased speakers.

The Registrar suggested that if the choir was placed in a recess of resonant wood above the level of the speaker, he would not be affected.

Mr. Baxter said the objection to seating the choir in a groined recess behind and above the speaker was, that it formed a volume of air behind him which he had to maintain in vibration all the time he was speaking, and which weakened the sound. The higher the recess could be raised behind the speaker the better. He had noticed one church in which the choir was directly above the speaker, the front of the choir gallery being brought out about 4 feet, the under side of it forming a cove, which to a great extent kept the sound vibration directed from him out to the audience, and leaving a clear and sympathetic vibration which did not affect the main church at all.

Mr. Edwards agreed with the essayist that it was difficult to formulate any definite laws on the subject of acoustics; it was a case in which "doctors differ." The whole theory of wave sound was doubted by some, who adduced very good reasons in support of their unbelief, contending that it takes so much effort to set in motion the atmosphere which is the means of communication, or which is the matter on which the wave sound has to act. As an illustration of that they contended the distance the sound of a grasshopper is heard would require tons of power to produce the wave sound at such a distance if the wave theory were correct. That being the case, it was necessary to look carefully at the beginnings on this subject, and to avoid building up any superstructure before the foundations were securely laid, and he thought the foundations of the matter required some further negotiation yet.

Mr. George Browne related his experience of a church in Winnipeg which on account of its great height was very defective in acoustic properties, and in which it was almost impossible to speak effectively. It was at last decided to take down the building and re-erect it on the same foundations, but with the height greatly reduced, and after that was done the pastor stated that whereas the old church was one of the very worst he had spoken in, after being so rebuilt it was one of the very best. He thought this demonstrated that not only length and width, but height also, had a very important bearing on the subject of acoustics. He had this summer completed a Presbyterian church, which was built exactly square, about 65 feet square, in which he had adopted the American system of placing the preacher in a corner. It had a gallery on two sides and coved plaster ceilings, and the tie beams formed deep panels in the ceiling. The result had been one of the finest buildings for speaking in the city, so much so that whenever religious meetings were held requiring a building with good acoustic properties, the persons interested tried to get this church to hold them in. In the Convocation Hall of Manitoba College they had a hall 65 by 35 feet, and he was told by the principal that he found no difficulty in speaking in it. There was a gallery at one end of the room and a coved ceiling. From his experience he believed that the coved ceiling aided very materially in causing the sound to travel freely throughout the hall.

Mr. Wickson asked if a coved ceiling at the end of an audience room opposite the speaker had the effect of causing an echo.

Mr. Browne said he always continued the cove all around the building; he thought it reflected the sound.

Mr. Baxter said he had observed in nearly all the Chicago buildings that the cove on the rear wall was far deeper than around the sides; in fact, they drew the cove line right round so that the entire body of sound was directed right down, and there was no chance for the formation of an echo, whereas if there were any straight line between the curve and the floor of the gallery, it would not have so good an effect.

Mr. Paull said an important matter was what should be the limit of size in a church in order to secure proper acoustic qualities. He had heard it said that 1,200 persons was the greatest number that could be accommodated so that the preacher could command their hearing. The church in Winnipeg spoken of by Mr. Browne as 65 feet square would have about that capacity. He would like to ask Mr. Browne how the extremities of the panels in the ceiling of that church were finished. Were they coved at the ends?

Mr. Browne stated they were finished simply by running up a false rib. The tie beams came across and then they ran them down on the cove to a small projecting cornice.

The President stated that in regard to the remarks of Mr. Edwards about the grasshopper, he thought it was necessary to take into consideration the number of vibrations in the air;

he supposed the more rapid the vibrations of the air the more penetrating the sound would be.

Mr. Edwards said he had not the confidence in coved ceilings that had been expressed by some of the members. He had in his mind a large room or auditorium which was almost as bad acoustically as the Grimsby temple, the ceiling of which was very deeply panelled and with a very extensive cove and all the other features which had just been pronounced of no great advantage. It was really a most miserable place to speak in. At one time the platform was placed on the long side of the building, but the echo was so bad that it had to be changed to the other side, which produced slight improvement, though it was not perfect by a great deal yet. These things did not always work in accordance with one's preconceived ideas. He had happened to have a building somewhat similar to the Winnipeg church rebuilt by Mr. Browne, and he had recommended putting in a gallery, which he hoped would remedy the trouble that existed.

Mr. Browne said he regarded a gallery as necessary to secure good acoustic properties in a church. Another matter he wished to mention was that the windows in Westminster church had circular heads, cutting into the cove, just the same as a vault or groin, and he would not at all wonder but that assisted the sound.

Mr. Edwards said one of the best auditoriums he had ever been in, speaking from the acoustic point of view, was the Casino of New York, which was built very much after the style of the Massey Hall in Toronto, only the recesses were much deeper all round. This had a very beautiful effect from the artistic standpoint, as well as being very beneficial to its acoustic properties.

The President said that in view of Mr. Browne's opinion that a gallery was necessary to good acoustic properties in a church, it would be interesting if anyone could tell what had been the effect in St. James Cathedral in Toronto, from which the galleries had lately been removed. He thought an instance of the detrimental effect on good acoustics of a high ceiling was to be found in the chamber of the Parliament Buildings in Toronto, which was one of the worst rooms possible for hearing in.

Mr. Wickson suggested that that might be due to the influence of having been designed by an American architect.

Commander Law asked if the Massey Hall was regarded as a good building acoustically, and what effect the "gingerbread" work had on its acoustic properties.

Mr. Edwards said he had no knowledge of the acoustic properties of the building referred to, and had only spoken of it with reference to its structural resemblance to the New York Casino.

MODERN FRENCH ARCHITECTURE.

IN addition to various interesting articles on engineering and social subjects, the *Engineering Magazine* for March contains one on "Recent Architecture in France," by Mr. Barr Ferree, which is abundantly illustrated. We take the following from it:—

The most distinguishing characteristic in current French architecture, the element that may be seen in almost every building, the quality that may be noted in every locality, is the adaptability of the structure to its purpose. If it is a school building it is a school and nothing more. If it is a town hall it is as unmistakably that, and is as elaborate a piece of architecture as the appropriation made for it permits. If it is a great palace or an expensive museum it partakes of the natural character of these structures. In business buildings alone is this nice balance sometimes lacking. If funds are short the building is correspondingly simple; if they are ample it is correspondingly rich. There is always a careful adjustment between funds and purpose and architecture that the people of other lands would do well to ponder over and profit by. Those American institutions—and several might be named—that have projected costly palaces for themselves with only a fraction of the necessary funds in hand are proceeding upon a principle of economics in architecture that no Frenchman would venture upon. But this is one of those common-sense procedures in French architecture that our importers of that commodity have as yet failed to bring over.

The results of this common-sense policy are just what might be expected. The Frenchman does not build for show, unless he is able to carry out his project. He is never afraid to build simply and plainly; nor does he hesitate to satisfy himself with a plain wall—though he will go so far as to whitewash it—if that is all his money will permit him to do. Architectural art often loses by this habit, but there can be no doubt that the French people are gainers by it. Examples of this may be seen in almost every city and town in France. The schools, of which a prodigious number have been built, are excellent types of it. Plain, simple, unpretentious, almost ugly buildings in their absolute want of artistic form, these well-planned, conventionally-

designed edifices must, for all their lack of pretence, be counted among the most important and successful of modern French buildings. For, plain though they be, it is not slipshod building that they illustrate, though in America they might be spurned by the average architect and ignored by the best as beneath the notice of masters of their art. These plain walls, these severe forms, are part of the system on which the buildings are designed. Intended only as coverings and housings for the schools, it matters little what their external form may be if their planning is judicious, economical and wise. That is the real strength of these buildings; their façades are nothing, their plan is everything.

There is much wisdom in such a system, but it is not applicable to every sort of structure. A plan is not a building, though it is a good start and an essential foundation. But if modern French architecture had nothing to offer but these formless schools and kindred buildings, the system under which they are produced would soon topple off its lofty perch on the apex of architectural art in the nineteenth century. We may regard the absence of architectural features as admirable in buildings where their presence would be a superfluity or where the funds in hand will not permit their use, but we require more than a plan to satisfy our conception of modern architecture as an art. Yet the disdain with which the elevation is frequently treated in these elementary structures sometimes appears in more pretentious works, for in these too frequently the façade fails to equal the plan in excellence, and students at the school make no secret of the fact that the larger part of their time is given to the study of the plan, the elevation being left until the last, when it is, as it were, pitchforked upon payer and regarded, apparently, as the product of inspiration rather than as the result of profound study and careful thought.

If one sees many buildings in France that interest only by their severe insistence on commercial or financial requirements—and these are not what we call commercial buildings in America, but schools, manufacturing establishments and the like—one is not less astonished by the prevalence of bad buildings. For one masterpiece there are a thousand horrors—a truly extraordinary state of things for a country which not only affects to lead the world in art, but which supports a great school of architecture for the creation, maintenance, and preservation of an architectural standard. We may look upon such a condition at home with a certain equanimity, since we can always console ourselves with the thought that we know no better. But France! Surely if anything is admitted in modern art it is that they do things better in France than in less enlightened countries. And yet if all the pretentious buildings erected in France in the last twenty years could be gathered in one single exhibition—barring such extraordinary masterpieces as the Opera House in Paris, the Palais de Longchamp at Marseilles, and one or two similarly ornate structures built under unusual circumstances—the proportion of interesting buildings to bad, of good things to indifferent, would be found very small indeed. That this is actually so cannot, I think, be denied. That it is so relatively leads to but one conclusion—the failure and incompetency of the School of Fine Arts to introduce an architectural standard that its pupils can carry into actual practice.

Suppose, in the list of buildings that might be considered above the average, both by purpose and in cost, there were fifty or even a hundred; what would that be out of the enormous total of other structures erected in the same period? Look at the conditions that surround architecture in France. Elevated to the dignity of a department of the Government, given a costly and superbly equipped school for the training of young architects, provided with every apparatus, given every opportunity, dowered with prizes and rich collections—architecture enjoys opportunities in France that it has in no other land. And when to this we add the natural artistic tastes of the French people, their rich artistic past, their countless artistic monuments, their environment, their skill, their ingenuity, in very truth it would seem that the production of architectural masterpieces would be an everyday occurrence to them, while no trouble at all should be experienced in giving less pretentious structures that grace and beauty they could not have in less happily situated lands. Is it too much to ask for this? Is it too much to look for extraordinary things when men, after all, are but human and accustomed to mediocrity?

Unquestionably it is too much to insist on masterpieces as the solitary product of the school of fine arts. Doubtless it would be both delightful and elevating if such were the truth, but the history of architecture—and the history of French architecture is not an exception—shows that masterpieces are the rare gems, not common everyday affairs. It is true this rule was all but broken during the great cathedral-building epoch in the thirteenth century, and again when the valley of the Loire was dotted with its châteaux, but those were exceptional times that have no counterpart in the present day. And it is further true that the educational work of the school is chiefly concerned with the making of masterpieces on paper, and it might perhaps be in order to ask that some of this skill,

so abundant and so plentiful in student days, should be served up in appreciable quantities in real structures. But, while it may be true from the French standpoint that all its architects are capable of producing masterpieces, very few of them, with the opportunities of producing great buildings that occur more frequently in France than elsewhere, ever actually have the chance of doing something really great. The most they can do is something good, and it is by this they should be judged.

Did time and space permit, it would be interesting to interrupt this discussion for a little dissertation on the geographical distribution of modern architectural monuments in France. If architecture is so important an art in France that the Government can support a costly school for instruction in it, there must be ample opportunities for its graduates to build and cover their land with buildings both interesting and good. Yet I have been solemnly assured by gentlemen who have made their life-work the diffusion of architectural knowledge in accordance with the French standard that it is only in Paris that notable works in architecture are to be looked for. Is it true? I trust not; I do not think so; but at least this statement reflects cultivated and trained opinion on the subject, and saves one the bother of visiting departments in search of modern architecture. But let us, for the nonce, accept it as fact, and study the monotonous streets of Paris.

For Paris streets are monotonous, with a deadly dullness that only London streets of the first part of the century can equal. It is a different sort of dullness, while the older London architecture is dull through lack of form and art and variety, the newer Paris architecture is dull through an affected and attempted variety. They no longer build structures as featureless as those that line in the Rue de Rivoli, or edifices as sober and thoughtful as those that form the Place Vendôme or the Place des Vosges. They do much worse than either style illustrated in these different groups. No house, no structure of any kind, is now erected in Paris that is not plentifully supplied with pilasters, apparently deemed as essential as the windows or the enclosing walls. Every floor must have its balcony carried on stone carved corbels, and railed off with light iron grilles. There must, after a certain height, be a cornice, likewise carried on corbels. And over all there may be one or two storeys, an attic, and a curved roof, or something pieced on to eke out the height. And when we have put casement windows to the openings, and lace sash curtains to these, we have obtained a design in the most approved Parisian style for block buildings. It is simple enough, and, in capable hands, possible of satisfactory and pleasing treatment, but when repeated a thousand times in a single street, and on every cross street and in every part of the huge expanse of Paris, and in every modern street of every modern town in France, it becomes monotonous and sickening. Its possibilities have long since been exhausted; the surfeited student can scarce keep back a cry for something different.

Academic training in architecture may not be directed toward such an end, but this distressing monotony is one of the results it produces. As a natural consequence there is not in all Paris a single restful stretch of wall. What is left of a front, after the windows have been cut in it, is used as standing room for pilasters; or cornices and balconies straggle across it until of plain restful surface there is nothing at all. This would be bad enough were the ornament applied to the walls good and sufficient, but when most of it is very bad, hard, cold, unsatisfactory detail, verging to one or the other extreme, either too coarse and florid or too refined and small, it becomes absolutely intolerable. But the real state of things is much worse than this implies; with all his respect for the past, with his dependence on precedence, with his ceaseless copying, his endless reproduction of past forms, a French architect is never so happy as when he is inventing a moulding or a column of his own, unless indeed it is when he is going further than this, and is making a purely original Order. That most of these newly-manufactured additions to architectural knowledge are wanting in the very elements that make the Greek and Roman Orders good and great he does not seem aware, for whenever the chance occurs he gets busily to work, turning out aberrations and doing his level best to make his work as extraordinary and as individual as he can, doubtless under the impression that he is thereby showing a vast amount of originality and perhaps some little industry and invention.

Recent French architecture is very largely deficient in feeling, and this arises in good part from the hardness and inefficiency of the detail. French architects appear quite incapable, even in their most academic designs, of throwing off their academic training. Their designs want life; they are deficient in vitality and feeling. Is it due to a striving after realities which the designer himself is incapable of producing? Is it due to a lack of appreciation of these qualities in architecture? Or is it due to a simple inability to do otherwise? Possibly all things may have their influence in one way or another, but whatever the reason, the results are clearly in evidence.

The conditions under which architecture is practised in

France apparently have their influence on this use of detail. French buildings divide themselves into three general classes. In one are the utilitarian structures treated in a utilitarian manner, admirable in its severity, though not additive to the beauty of the cities. In another class are ordinary blocks of city buildings designed almost on a single model, calling for little effort at originality or variety on the part of the designer. In the third class are the more ornamental and monumental structures with which the soul of the French architect is delighted, with which the architects of other lands are dazzled, and by which it is to be presumed the architecture of to-day in France is to be measured. But while few really monumental structures are produced, the possibility of their production is present to every one. It is small wonder therefore that the methods to be employed in more pretentious buildings should be employed in less important ones. The richness and overloading of many French designs, the constant employment of pilasters, especially where they are not needed, the introduction of new Orders and the invention of new detail—all these may be but a survival of the idea that every man may design a masterpiece in his day, and his application of these things to every sort of building may only be an effort to keep his hand in.

THE AMERICAN SCHOOL OF ARCHITECTURE AT ROME.

At a meeting held at the Century Club on June 12, 1894, at which the American School of Architecture in Rome was established, the executive committee appointed at the time was instructed to invite certain gentlemen to constitute a permanent committee of managers and to call this managing committee together at a suitable time and place to complete their organisation, and to determine upon the policy in accordance with which the school should be conducted.

The school is founded for the benefit of advanced students, and is designed to further the work of the institutions in America now offering courses in architecture, and thus promote regular progressive academical training. It offers a post-graduate course, open only to the beneficiaries of the travelling scholarships connected with those institutions, to those who have acquitted themselves with signal ability in the examinations for those scholarships, and to members of the Ecole des Beaux-Arts in Paris of at least three years' standing. Other well-accredited students are admitted to certain hospitalities of the School at the discretion of the secretary.

Cornell University, the Institute of Technology in Boston, Columbia College and the University of Pennsylvania have well-established schools of architecture. Harvard University has taken significant steps toward the establishment of courses in architecture and Yale University has them in contemplation. There are at present travelling scholarships at Columbia College, Cornell University and the University of Pennsylvania, and, in addition, the Rotch scholarship in Boston, which is not connected with any institution.

The foundation of the school is an undertaking of national interest, and has enlisted the support and sympathy, not only of some of the foremost educators and members of the architectural profession throughout the country, but of distinguished persons in the community at large interested in the advancement of the arts. The managing committee consists of R. M. Hunt, C. F. McKim, W. A. Boring, W. M. Kendall, Augustus St. Gaudens, J. Edward Simmons, H. G. Marquand, Samuel G. Ward and J. A. Garland, of New York; R. S. Peabody and Martin Brimmer, of Boston; D. H. Burnham and Franklin McVeagh, of Chicago; George E. Leighton, of St. Louis, and the chiefs of the departments of fine arts or of architecture in the principal institutions which maintain courses in architecture, namely, Professor Norton, of Harvard College; Professor Babcock, of Cornell University; Professor Chandler, of the Massachusetts Institute of Technology; Professor Ricker, of the University of Illinois; Professor Ware, of Columbia College, and Professor Laird, of the University of Pennsylvania.

The institution has already developed into an undertaking of much greater magnitude than at first was contemplated. Early last spring a number of practising architects and representatives of institutions of architecture of New York, Boston, Chicago, Philadelphia and elsewhere, met and discussed the most feasible plan for the direction and guidance of the holders of prize scholarships in their studies abroad. Hitherto the beneficiaries of these scholarships have followed very largely their own devices, travelling from place to place, filling their sketch-books with miscellaneous material and sending home but few carefully-measured drawings. These "envois" bear testimony to the diligence of their authors, their facility with pen, pencil and brush, and their evident serious intention. On the other hand, considered collectively, their work has shown no common purpose, and individually little intelligent prosecution along consistent lines. This being a matter of

common observation, the past holders of travelling scholarships are general in their approval of the effort to confine foreign travel and study hereafter to a definite and specific course. These considerations at first led simply to the idea of establishing an "atelier" at Rome with a competent instructor at its head, but the more the matter was discussed the greater became the interest in the undertaking, and finally it was determined to found an institution upon a broader basis—one which in the course of time should equal in endowment and advantages the foreign academies at Rome, although somewhat different in its scope and object.

The school is primarily one of contact and research, rather than of design, aiming at the formation and education of a correct taste and to impress upon the mind, by daily contact with the great monuments, those principles which are essential to the enduring quality in architecture, be the style what it may. Nor does it seem necessary to add that it is not a place of copying, in the sense of collecting "motifs" to be reproduced at home with pedantic exactness. The founders of the school believe it to be essential for the professional architect to study thoroughly and on the spot the best examples of ancient architecture and of such Italian Renaissance as is worthy of being considered its successor. For this purpose the monuments studied will be chiefly those of Rome and Athens, the headquarters of the school being established at Rome rather than at Athens, because of the greater amount of material in the former city of use to the modern student, whether in the art of architecture, of mural decoration, or of the kindred arts. Moreover, too much cannot be urged in favour of a prolonged stay of several years, not only for the purpose of more thorough study, but for the sake of an appreciation of the true spirit of Classic art such as is to be gained no other way.

The School was formally opened under the charge of Austin W. Lord, as secretary, and began its work on November 1 last in eight rooms, occupying the upper storey of the Palazzo Torlonia, on the south-west corner of the Via Condotti and the Via Bocca di Leone, between the Corso and the Piazza di Spagna.

In the absence of settled organisation, it will require another term before the school may be said to be fairly launched, but it is satisfactory to note that of the four travelling scholars this year abroad three have been following the course of the school.

Departments of painting and sculpture are in contemplation, and, it is believed, will be started within a year. Meantime, the committee has been in receipt of numerous inquiries in regard to the condition and purposes of the school, and as to the possible range of its operations. It has been asked what advantages it offers, and on what terms, to students of architecture who are not qualified to become members of the school. Inquiries have also been made in behalf of students of archaeology and epigraphy, whether the advantages of the school cannot be extended to them, and it has been suggested that some sort of co-operation may be practicable by which their interests and those of the school may be mutually promoted. To these inquiries answers have been made in accordance with the resolutions of the committee, and it has been added that any suggestions looking toward the promotion of any interests in any way germane to those which the school has already in hand would be cordially received.

In response to this intimation, notice was given at the recent joint meeting of the Archaeological Institute and other learned societies in Philadelphia that a discussion would be held in the rooms of the University on the afternoon of Friday, December 27, in regard to the possible establishment in Rome of a school of architecture, archaeology and epigraphy. At this meeting, which was largely attended by persons interested in Roman literature and antiquities from all parts of the country, great interest was manifested in this suggestion, and a committee, consisting of Professor W. G. Hale, of Chicago University; Professor Frothingham, of Princeton, and Professor Minton Warren, of the Johns Hopkins University, was appointed to confer with the architectural school at Rome, and to report to the Council of the Archaeological Institute at their meeting in May what they might find practicable and desirable to accomplish.

Meanwhile it has been suggested that the building known as the Casino dell'Aurora, occupying a part of the grounds formerly belonging to the Villa Ludovisi, would afford an admirable seat for such a school or schools, and that it could probably be leased for a term of years for a sum which, though larger than would be needed for hired chambers, might not be extravagant or unreasonable in view of the great advantages offered. The building is situated upon an isolated plot of ground raised 15 or 20 feet above the surrounding streets, and comprising apparently about 80,000 square feet, which is the size of the enclosed space in Gramercy Park in this city. It is on the Pincian Hill, not far from the French Academy in the Villa Medici. The building itself contains about thirty rooms. Some of these are decorated with well-known frescoes, among which is the famous *Aurora* of Guercino. The grounds,

which were laid out by Le Nôtre, are well covered with trees and shrubs and afford ample space for the erection of additional one-storey buildings, should such be required at any time for work rooms or studios.

The experience of the winter seems to show, what indeed was to be anticipated, that whatever advantages the establishment of such a school may bring to students who are in attendance for a short period, the serious study which it is intended to promote is to be had only from those who devote to it serious and long-continued labour, and that such work is not reasonably to be expected except from young men who go abroad with this special purpose in view. This has also been the experience of the American School of Classical Studies at Athens, which, while it has been of inestimable service to the sixty or seventy students of the Greek language, literature, history and art, who during the last twelve years have availed themselves of the opportunities it has afforded, has not succeeded in developing the class of serious workers in archaeology which it is the ultimate purpose of such a school to create. The managing committee of the Athens School are accordingly now taking measures to establish special scholarships, to be held on the condition that the beneficiaries shall spend twelve months in prosecuting their studies in Athens and other Greek lands, under the direction of the school. It has become plain that the main object of the Roman school enterprise can be compassed only under similar conditions. It will accordingly be gratifying and satisfactory to know that a scholarship called "the Roman scholarship," of the value of 1,500 dols., the holder of which will pursue his studies at the school, has this year been offered to be competed for by graduates of any of the architectural schools in this country, or by members of the Ecole des Beaux-Arts of two years' standing who are less than thirty years of age.

It is believed that the foundation of the school in Rome marks a distinct advance in the history of professional education in this country, and that it will result in the creation of a common standard of instruction in the different institutions whose work its chief aim is to continue.

THE ROYAL DUBLIN SOCIETY.

THE annual report of the Royal Dublin Society contains the following reference to the new lecture theatre:—

The Council have much pleasure in reporting that the building of the new lecture theatre is at length in progress. At the general meeting of the Society twelve months ago the Council were obliged to express their disappointment that so much valuable time was being lost, more than a year and a half having elapsed in negotiations. On April 17, 1894, some members of the Council had an interview with the Commissioners of Works and saw, for the first time, the detailed plans upon which tenders had been obtained. As a result of the conference a letter was received from the Commissioners, dated April 24, 1894, in which they stated that it had been found necessary, for the sake of economy, to make alterations in regard to materials to be supplied, but that otherwise the design of the proposed fabric would remain precisely as designed by Sir T. Deane & Son, with the following exceptions:—(1) The coal-cellar and boiler-house in the basement; (2) the sliding-stage and diagram-board; (3) spare or photographic room over offices; (4) the organ-loft; (5) the room over front colonnade. Items 1 and 4 the Council admitted to be additions to the original design, and they accordingly agreed to provide the sum of 483*l.* 2*s.* 8*d.*, which these additions were estimated to cost. The other items the Council regarded as essential parts of the original design, and they urged that they should be included in the contract. It then transpired that a serious difference of opinion existed about item No. 5—the room over the front colonnade. It was claimed by the Society that this room was shown on the plan attached to the agreement which the Commissioners had entered into with the Society for the building of the theatre, as one of the rooms to be provided for the Society. It was contended that the room could not be omitted without infringing the agreement, which provided that any modification of the plan attached to the agreement that might be found necessary should not "entail any diminution of the accommodation shown by the said plan." On the other hand, the Board of Works maintained that this room had no necessary connection with the requirements of a lecture theatre, and that it was intended solely as a substitute for the present unsightly wooden passage connecting Leinster House with the museum. They pointed out that the Science and Art Department had claimed the room for museum purposes. In this juncture the Council sent a deputation to London to place the Society's case before the Treasury. The decision subsequently arrived at by the Treasury was conveyed to the Society in a letter, dated May

26, 1894. This letter stated:—"Two courses are now open—(1) to proceed with the work, excluding entirely the room in question; (2) to carry out the work as tendered for, adding thereto the room over the portico, and also a room above it, having the same area, but with lower walls." The latter room their lordships proposed to place at the exclusive disposal of the Society. The Council were not disposed to assent to either of these proposals, and being fully convinced of the justice of the Society's claim to the room in question, they proposed that the point in dispute should be decided by arbitration. This proposition was declined, and it appeared for the moment that further attempts at a settlement of the question were useless. It was found, however, at an interview with the Commissioners of Works that a compromise was possible, and the Council embodied the conditions they were prepared to accept in the following resolutions:—"Resolved—That the Council assents to the possession of the first floor portico room being given to the Science and Art Department as a connection and as a means of communication between its offices in Leinster House and the Museum Buildings, it being, however, a condition that the room in question shall be built concurrently with the lecture theatre, and in accordance with the plans already agreed upon. That the Council accepts the alternative proposal No. 2 as set forth in the Board's letter of May 26 last, on the understanding that in carrying out the work as tendered for the following shall be included, and the cost defrayed by the Commissioners:—1. The coal-cellar and boiler-house, estimated cost 133*l.* 2. The sliding stage and diagram board, estimated cost 164*l.* 3. The second floor portico room. 4. In the laboratory rooms, a firm concrete floor on rolled steel joists, the concrete being covered with planking. That as regards the room known as the spare or photographic room, estimated to cost 177*l.*, the building of this room shall be carried out simultaneously with the construction of the theatre, the funds to meet the expense being provided for out of any excess beyond 5,000*l.* cash realised on sale of the 2½ per cent. stock, now standing in the names of the Commissioners and the Royal Dublin Society, the Society undertaking to make good any deficiency as between such excess and the said sum of 177*l.*" In a letter dated July 11, 1894, the Board informed the Society that the Treasury had sanctioned the execution of the work in accordance with the foregoing conditions, and that it would be pushed forward as expeditiously as possible. Shortly after the contractor had commenced operations the Council drew the attention of the Board to the importance of having a proper system for heating and ventilation decided upon from the outset, and submitted particulars of the conditions which, in the opinion of the Council, it was necessary to observe. This matter is now under consideration; no decision has yet been arrived at. The Council attach the utmost importance to the heating and ventilation of the new building, and they will do everything in their power to insure that in this respect the new theatre shall be as perfect as it can be made.

DISCOVERIES AT BATH.

IN his report to the Town Council on the excavations at the Roman baths in Bath, Major Davis states:—

In following the Roman wooden duct at the baths which has been previously described, the workmen have come across another Roman drain built of colossal stones, some of which are 7 feet long, the bottom of which is also paved with stone. In removing the soil several interesting antiquities have been discovered.

1. A bronzed barbed fish-hook of very delicate form about 1 inch in length.
2. A crystal belonging to a ring oval 7·16th of an inch long by 5·16 wide and 3·16 thick.
3. An Egyptian blue glass bead with a pattern in white.
4. A sardonyx with a figure on horseback apparently holding a large wreath, very spiritedly engraved. The stone is oval, nearly half an inch long by 3·8th inch wide and 3·32nds inch thick. Unfortunately this is a little chipped.
5. A chalcedony, a seated helmeted figure under a tree, and what appears to be a goat, oval, 5·16th inch long, by 9·16th inch in thickness, 3·32nds. This is of very rude work.
6. An amethyst, a nude figure in a biga driving very spirited horses, over 7·16th inch long, by 5·16th inch, and 3·16th thick. The other stones are all engraved on a table surface; but this is convex. There are two other mock stones, one the colour of an aqua marine, the other a sapphire. They appear to have been engraved originally, but too obliterated to decipher. Since writing the above I have found the following in the same drain:—
7. A bloodstone, a winged lion has the advantage of horns. I suppose I should be more correct in calling it a chimera oval, 7·10 by 6·16 and 3·32 inch thick.
8. A chalcedony, a very rude representation of an eagle

oval nearly 9-16 long by 7-16 wide and a trifle over 1-16 inch thick. We also found three coloured glass rings or beads.

Both seven and eight appear to be unfinished work, and if this is the case they may indicate that the smaller rooms of our baths were used as shops (Torbernæ), and that lapidary was one of the trades patronised by the bathers. The idea that such shops existed is further strengthened by the finding of a fish hook in the drain, as it could be easily accounted for if I may assume that a fishing tackle maker had also a shop at the baths.

Major Davis, according to the *Bath Argus*, pointed out that the intrinsic value of the antiquities amply compensated for the expense incurred in discovering them. Perhaps the Chairman had better keep them in his custody. They were found in the stone drain, which he hoped the committee would not object to his having washed. He had only just got about five or six feet into the duct, and had not discovered the outlet, but he had found a drain, of the existence of which he was previously unaware, leading into York Street.

Mr. Taylor, in moving a vote of thanks to Major Davis, said it would be a pity to stop him in the midst of his inquiries, everything which had turned up having proved of the greatest interest.

Alderman Commans seconded, and said he thought Major Davis should be allowed to proceed until he found the exit.

Alderman Freeman: The duct may have no exit.

Major Davis said it was worth while going on for the sake of finding more relics, which were generally most thickly collected in pits such as the Romans probably used as rubbish heaps.

Sir Jerome Murch thought they should know the expense before they began.

It was decided that the surveyor works should go on with his present investigations as to the duct.

Mr. Morris suggested that a winch or crane should be erected in order to save expense and labour in removing the debris as it was unearthed, and it was decided to carry out this proposal.

The Mayor proposed that the Council should be asked to vote a sum of money for the purpose of pursuing further investigations.

Alderman Freeman said Mr. Irving's collection had been lost sight of. Mr. Irving had considerable information as to the remains under the Pump Room of which they knew nothing. There was probably a portion of the old Temple of Minerva; what had been done was mere child's play compared to that.

Mr. Radway protested against any further steps being taken. If the committee proceeded they would be in for hundreds of pounds.

Mr. Oliver: Thousands.

Mr. Morris said that Messrs. Long's charges must not be confused with those incident on the other excavations. He had no objection to Major Davis going on as long as he found relics.

The mayor's proposal was then carried.



Specialties in Quantities.

SIR,—Re above, as per letter in yours of the 8th inst., may I, as one connected with a firm of cement manufacturers, ask you to insert a few lines which, from our present day experience of the far too low a price which cement is generally put on the market, seems to be the only remedy for the growing evil of "Cut prices, cut quality." We have always made it our business to manufacture a specialty, that is, an article superior in strength, durability and reliability to that usually put on the market. In former times we had far less difficulty in getting the public to pay a high enough price sufficient to induce us to strive at improving the quality of our manufacture, but now in these times of extra competition many of them say, "We would rather use your cement, knowing it as we do, but every shilling has to be looked at; and as we can buy a cheaper article good enough to meet the standard, we consequently cannot afford to use what choice would suggest but necessity debars." Public companies who do their own work buy the best materials, because result is everything and they have no competition. But in open tendering, unless the best articles are specified they are seldom used; consequently to induce all of us to improve our quality is for those who draw up the quantities to specify what their experience tells them is the best, or to allow extra portions of sand or ballast to those manufactures which are practically proved to be superior and

in the long run the cheapest material. None of us can spend increased money in improving quality unless it is recognised by our having the help of being specified, which prevents contractors tendering on any but the specified articles.

March 19, 1895.

GAMECOCK.

SIR,—In your issue of March 8 there is much of truth in the letter from "One in the Know." I as a salesman in a large merchant's business, with one of the largest and oldest connections, find the difficulty of selling an article considerably superior to that generally put on the market because it happens to cost some 10 per cent. more to manufacture it, and consequently its sale price is increased to that extent, which extra quality is the chief cause that brings it under the head of "specialties." Many customers, knowing its superiority, and fearing to lose a hard-earned reputation, use it, but grumble at its increased price; others, while admitting its superiority, decline to pay an extra price when they can get a substitute, which, while being a far less durable article, will pass muster at the low standard generally in force in the market. The too keenness in competition at the present time means much using of materials of the cheapest kind, which, below a certain point, must be made a sacrifice of quality, the result of which is the investor and subsequent owner, though possibly saving a trifle in cost of a building, pay too high in price for what is often not built with the best manufactured articles, and which in small speculation builders is called "jerrying." The remedy is this:—Specifiers in quantities must recognise manufacturers of proved superiority by definitely specifying them. The merchant builders would far rather sell the best class of building materials, but when "A1" class of goods are not specified, we can only sell at the price of inferior articles, which is what, at the present time, we are chiefly asked for.—Yours truly,

MERCHANT.

GENERAL.

Mr. A. Grainger Eejton has been appointed architect for the restoration of the Perth Municipal Buildings, lately destroyed by fire.

Mr. H. G. Hine, Vice-President of the Institute of Painters in Water-Colours, died on Saturday last at an advanced age.

An Anonymous Donor has sent a cheque for 5,000*l.* to the building fund of the new St. Peter's Church, Eastbourne. The Duke of Devonshire gave the site and 5,000*l.* towards the erection, but owing to the want of funds the committee had decided, until this gift came to hand, not to proceed with the erection of the chancel.

The Designs and Looms of the Royal Windsor Tapestry Works were sold on Monday by Messrs. Barber & Harding, this dispersal of the plant marking the extinction of a costly undertaking, which for a time promised to revive an ancient decorative art in England.

Mr. H. Montague Bates, hitherto assistant clerk to the City Commission of Sewers, was on Tuesday appointed principal clerk in place of Mr. Blake, resigned.

A Monumental Stone has been placed in Peterborough Cathedral, over the spot on the north side of the chancel where the remains of Queen Katherine of Arragon were buried. The cost has been defrayed by the "Katherines" of England, Scotland, Ireland, America and others. The inscription is as follows:—"Here lies the body of Katherine of Arragon, Queen of England, and first wife of Henry VIII., who died at Kimbolton Castle on the 8th day of January, 1535-6, aged forty-nine years."

Warehouses for the scenery of the Opera and Opera Comique, Paris, are about to be commenced at the fortifications. The contracts for the masonry, carpentry, ironwork and roofing are settled.

M. Puvis de Chavannes has received the distinction of Commander of the Order of Leopold from the King of the Belgians, as well as Sir J. E. Millais and Sir J. D. Linton.

The Students who are to compete for the Prix de Rome in architecture are M.M. Dusart, pupil of De André & Laloux; Duquesne, pupil of De Pascal; Bigot, pupil of De Laloux; Mercier, pupil of De Laloux; Patouillard, pupil of De Ginain; Pille, pupil of De Pascal; Garnier (Tony), pupil of De Blondel; Umbdenstock, pupil of Guadet & Paulin; Aubutin, pupil of De Pascal, and Lemaesquier, pupil of Laloux.

An Official Return shows that within the municipal limits of Venice there are 14,182 houses, inhabited by 31,419 families.

The Design by Messrs. Campbell Douglas & Morrison, of Glasgow, has been adopted for the new free library at Perth, which is estimated to cost about 9,998*l.*

The Royal Society of Water Colour Painters has, by the death of Mr. A. D. Fripp, lost a zealous secretary. He was born in 1822, and since 1846 has been a member of the Society.

The Architect.

THE WEEK.

WHEN the British Archaeological Association passed a resolution in connection with proposed excavations at Tara, in noticing the matter recently we took occasion to doubt the desirability of disturbing the remains of the dead. We are not surprised now to be informed that the action of the English Association does not commend itself to Irish archaeologists. Some of the better-informed members of the Council of the British Archaeological Association, endeavoured, but without much success, to dissuade the raiders from interfering with what might be allowed to remain in the hands of the Royal Irish Academy and the Royal Society of Antiquaries of Ireland, if it were necessary to carry out such a work. The latter Society visited Tara last summer and appointed a committee to report on the scientific investigation of the Tara and other mounds in County Meath. It has been ascertained by the local societies that, in making an estimate of the cost, a sum must be included sufficient to cover the expense of a special police force while the work is progressing. As matters stand at present, if the explorers were fortunate enough to avoid having proceedings taken against them in a criminal court, they might find themselves involved in a civil action. It is not likely the British Archaeological Association will do anything in the matter, and the feeling is against their interfering in explorations outside England, and more especially as great energy has been shown by the Royal Irish Society of Antiquaries in dealing with all those matters relating to the past in Ireland where there are no reverential feelings to be outraged by navvies with pickaxes and shovels. It would be wiser for the British Archaeological Association, if they must have Irish spoil, to set about a search in the curiosity shops of London for the famous harp "that once through Tara's halls the soul of music shed" rather than to make a raid on the graves.

In a generous spirit Mr. HINE undertook to give the Dublin Poor Law Guardians the benefit of his experience in judging the plans of the Portrane Asylum. But he has not received much gratitude. The report of the assessors on the competition seems to be rather severe on Mr. HINE, who was, strange to say, one of the three. It expresses regret that none of the competitors exhibited any experience of asylum planning. Now as the leading inspiration of two-thirds of the plans submitted was bodily "lifted" (and with commendable discretion) from Mr. HINE's own Claybury plans, the assertion is rather hard, although appearing in sorrow rather than in anger. The "predominant partners" in the determination, like the Progressives on the London County Council, have taken advantage of their tyrant majority in reporting regardless of what Mr. HINE may suffer. There seems to be general and well-grounded dissatisfaction that the Board of Control have not fulfilled their explicit printed conditions, which undertook to place three designs first, second and third in order of merit, but instead bracketed three as "equal," and finally, it is understood, has given the job to Mr. ASHLIN, who out-distanced other competitors by 40,000% in his estimate, and by acres in dispersing his buildings over the ground.

It is commonly said that money is cheap in the market, but people are by no means more eager than formerly to risk any in becoming sureties. At one time the becoming surety for a contractor was a sign of friendship between the parties, subsequently it suggested the relation of merchant and customer, finally it becomes a sort of insurance, and represents an outlay of money. Is it not time, therefore, that the lodgment of an adequate sum of money should be considered by those who enter into contracts for the execution of works by contractors as equivalent to an undertaking by men who thereby become sureties? But the deposit of money would be an innovation, and it may be

acute lawyers could discover that it was attended with risks. Otherwise we cannot understand why a committee of the Glasgow Corporation should on Monday have preferred persons to money. Messrs. MORRISON & MASON, the contractors for the excavation, masonry and brickwork at the Ruchill Hospital, offered to deposit 5,000% as security for the due fulfilment of the work. The acceptance of the proposal was moved and seconded. The Clerk, however, raised the objection that, in the event of a contractor becoming bankrupt, his creditors would have a claim upon the money. That opinion was disputed, on the ground that money assigned to a specific purpose could not be alienated. It might be possible in contract deeds to make an arrangement of that kind. When the voting took place it was found that twenty members were favourable to the innovation, while twenty-two wished to preserve the old system. The contractors will therefore have to pay a higher sum for security than they can obtain for their money.

It was hoped that on Tuesday there would be a decision about the extension or rebuilding of the Manchester Infirmary. The building occupies so prominent a position, it suggests the charitableness of the city, and on that account many wish to preserve it. But old hospitals are dangerous to patients, who should not be sacrificed to sentiment. On February 26 it was proposed by the board of management that two lateral extensions should be constructed. An amendment was handed in stating "that it is advisable that the increased accommodation required be provided by the gradual rebuilding of the infirmary on the present site, and that the board of management be requested to have plans prepared and submitted to a special meeting of trustees, to be held within three months from the present date." In order to give opportunity for all the trustees to consider the two projects, a poll was taken. It was announced on Tuesday that 442 trustees were in favour of gradual rebuilding and 154 for extension. The former course was therefore victorious, but three amendments to the amendment were proposed. One was—"That the plans prepared by Mr. BRIDGEN and Mr. HEATHCOTE, shown by the model in the room, and which were recommended in the annual report for adoption, whereby the required additional accommodation can be obtained by raising the roof an additional storey, are hereby approved by the trustees." But it was rejected by a large majority. The second amendment, to the effect that only such additions should be made as were necessary, was withdrawn. The third amendment, which was as follows—"That before proceeding further a committee, consisting of the members of the infirmary board, and an equal number of trustees who are not members of the board, be appointed to report on the best means to be adopted for increasing the accommodation afforded by the institution"—was adopted. After the long period already occupied in discussions, the result will not appear satisfactory, but it must be allowed the problem presents many difficulties.

THE Dean of Peterborough has made an appeal for aid towards the restoration of the west front of the cathedral. During the storm on Sunday last it suffered very severely. Four of the pinnacles have been injured or destroyed, and it is feared that many other parts of the façade have been seriously shaken. The full extent of the damage cannot be ascertained until Mr. J. L. PEARSON, R.A., has made his examination, but from a preliminary inspection which has been made by Mr. JOHN THOMPSON, the builder, it is manifest that a considerable expenditure is immediately necessary to secure the safety of the west front. The gables of the north and south transepts and part of the eastern chapel have been for some time pronounced by Mr. PEARSON to be in an unsafe condition, and the Dean has been endeavouring to raise the sum necessary for their repair. The interest attached to the cathedral is not confined to the people of the diocese. The preservation of the building should be a national concern, and we have no doubt the Dean will be gratified by a liberal response to his appeal.

THE PARIS EXHIBITION OF 1900.

IN this era of development it would be difficult to find a more convincing example of the principle than is presented by the buildings for international exhibitions. The idea which inspired them was undoubtedly derived from the French. It is true their exhibitions prior to 1851 were national rather than international, but they demonstrated that a large collection of industrial products in one place could become attractive. The French examples also suggested the advantage of having temporary buildings. When the project of an international exhibition in Hyde Park was devised, one of the early difficulties arose out of the apparent unfitness of the majority of the designs for the buildings. They were, if we might say so, too architectural. They did not suggest a transient undertaking. When PAXTON, who knew about the anxiety of the Commissioners to get hold of something bright, novel and removable, made a sketch on a piece of blotting-paper while he was supposed to be trying a culprit, by his happy thought he made the world his debtor. His building was really a glass case without any pretension to form. The semicircular part of the roof, the "blazing arch of lucid glass," which broke the monotony, was a suggestion by BARRY, who wished to save some elm trees. The plan was as simple as the elevation, and was only a very long and narrow parallelogram with two short transepts. Its success, however, has become legendary. To THACKERAY it was "a palace as for fairy prince, a rare pavilion, such as man saw never since mankind began." Twenty years afterwards it appeared to Sir DIGBY WYATT, who had seen all its successors, as an almost ideal building, which enabled single objects to be studied in detail, and yet allowed of grand pageants which could be enjoyed by large numbers of people.

In the French Exhibition of 1855, the temporary character was only partially adopted for the buildings. The Palais, which is still sound enough to be used for the Salon exhibitions, was a departure, as well as some of the pavilions which still exist. But all objects were not under one roof although the outlying parts were not distant. The exhibition of 1862 in London consisted of a series of contiguous buildings.

The plan of the Paris Exhibition of 1867 was an innovation, and undoubtedly one of the best that could be adopted for those who wished to study the products of the world. It might be described as a sort of ellipse with straight sides. The inner divisions corresponded with the exterior, and the intersecting routes enabled a visitor to study the objects of one country and in many cases objects of one class produced in different countries. The objection to the plan was that State ceremonies and other spectacular displays were impossible. The central space was laid out as a garden. We may grant, however, that the world is not so eager for ceremonial displays as in 1851. Business is now the inspiring principle in exhibitions. The exhibition of 1878 in Paris was evidence of the change, and the last exhibition of 1889 made more allowance for pleasure-seekers, inasmuch as there were great gardens and many outdoor attractions. There was, however, no part on which all eyes could centre, with the exception perhaps of a stage. But that part was so unsuitable for display that when the late Mons. CARNOT wished to welcome all the world to Paris he was compelled to take up a position in one of the galleries.

The conditions of exhibitions are greatly changed since 1851. The possibility of covering with one roof a space that would be equal to the requirements of the different departments is an impossibility. Engineering science has hardly the power to exceed what was done in the hall of machines in the Champ de Mars, which was about 370 feet in span. Separate buildings cannot be avoided. In 1889 it was found advantageous to make use of the Trocadéro building, although it was separated from the principal buildings of the exhibition by the Seine. We suppose it was found that the distance which had to be traversed did not cause much inconvenience, otherwise we could not expect that the scheme for the exhibition for 1900 should comprise so large a region and so many separate buildings.

The competition which was lately decided in Paris was merely one of ideas. All the premiated plans have been co-ordinated, after several weeks of labour, by M. BOUVARD,

with the assistance of some of the prizemen. From what has been deduced, it is now possible to obtain a notion of the exhibition that will inaugurate the coming century. In the first place, it will cover an extent of ground that is without precedent. The Champ de Mars and the Trocadéro will be used, but in addition a part of the Champs Elysées and the Esplanade of the Invalides. In other words, the Seine and a great deal of the open land on both its sides will be comprised within the boundaries. A new bridge across the river will unite the right and left divisions, and the roads which will be laid out will be arranged on lines that will allow pleasing views to be obtained.

Although crowds of people found their way in 1889 to the Champ de Mars, it is not the most attractive part of Paris. It is quite possible that if the forthcoming exhibition were confined to similar limits the success would not be renewed. For that reason we suppose the grand entrance of the exhibition will be in the Place de la Concorde. By that arrangement one of the favourite spots of Parisians and of all visitors to the city becomes, as it were, a key to the exhibition. On entering the visitor will find himself in an open space surrounded with statuary. This will lead him to several of the buildings which will be consecrated to fine art or to industrial art of the kind associated with Sevres. The Palais de l'Industrie, now used for the Salon exhibitions, will be supplanted by another of a more important character. If the bridge is crossed the visitor will find on the Esplanade of the Invalides more buildings which will be devoted to industrial art. Whether the arrangement is more logical to begin with the arts of the highest class instead of with materials may be left to theorists for discussion. One thing is certain, that the majority of visitors will be gratified by it, and France is suggested by the giving of prominence to what is beautiful.

The ordinary visitor is likely to be tempted, especially on fine days, to begin as soon as possible with the buildings which will line the river on both sides. Certainly they will be varied in character. Some will seem apposite, such as those which relate to the department of the marine in all its branches, and those relating to maritime and fluvial industries. But there will be also conservatories, kiosks, cafés, examples of buildings from foreign cities, and so on. Business and pleasure will be combined in what we may call the intermediate part of the exhibition, and a good many visitors will be likely to wish that the rest of the exhibition could be seen by deputy.

The importance of the objects that will be shown in the Champ de Mars cannot, however, be doubted; moreover, pleasure will not entirely be banished from the region. The Eiffel Tower will of course remain, but it will assume a more pleasing appearance, unless French ingenuity is less inventive than formerly. The hall of machines will be also conserved, but it will be rearranged, and at least a part of it will be utilised for public fêtes.

It is proposed to lay out the ground symmetrically. On each side there will be buildings of corresponding lengths, which will run nearly parallel with the river. As they will increase in length in proportion to their distance from the Seine, their character will be suggested at a glance to a visitor who stands near the Tower, and satisfactory perspectives can be enjoyed. The space between the buildings, which of course becomes widest as the Tower is approached, will be laid out in a variety of ways, fountains and lakes, which can be illuminated at night, being among the features. It is intended to have a separate palace for each of the great divisions of industry, and to assign to electricity the supreme position. By the close of the century who knows whether it may not be superseded by some other power? As a rule, each industry will have about one-half more space than was allotted to it in 1889.

The Trocadéro, or rather the grounds available in the neighbourhood of it, will be utilised for exhibitions of objects from the colonies. Here also we may expect to see the roving populations from east, west, north and south that are now inevitable with all exhibitions that claim to be international.

The task undertaken by M. BOUVARD has been most onerous. His plan appears to be satisfactory. It is not clear what will be the dominant part, but that is not always to be discovered beforehand. There is no doubt that in 1889 the Eiffel Tower, in spite of its demerits,

caught the fancy of the public: between now and 1900 it may be possible to discover something that will be a rival to it. But a still heavier task is before M. BOUVARD. It will be necessary for him in a couple of months to furnish an estimate of the cost of one of the most colossal undertakings that has been attempted since men began to build. The exhibition of 1851 cost 176,030*l.* 13*s.* 8*d.* The works proposed by M. BOUVARD will require, we suppose, an outlay of more than twenty times that sum. The French show in these matters a liberality which we can hardly understand in England. In 1867 they paid 22,983,820 frs. for their exhibition. In 1878 the amount rose to 55,390,000 frs., and in consequence they lost about 32,000,000 frs. The expenditure in 1889 was said to be 41,500,000 frs. It is considered by some speculators that double the last sum will be needed. It is an enormous outlay, but the receipts may correspond in amount. At all events, France is pledged to have an exhibition of an unprecedented kind in 1900, and that must be realised whatever may be the sacrifice.

GLASGOW ARCHÆOLOGICAL SOCIETY.

AT the last meeting of the Glasgow Archæological Society the chairman, Dr. David Murray, made fitting reference to the great loss which the Society had sustained by the death of their president, Mr. C. D. Donald. Mr. Donald, he said, had been cut off suddenly and in the midst of his days, just when his faculties had come to full maturity, and when reading and thought, experience and observation, were bearing fruit in a firm grasp of affairs and a deep insight into life and action. It was but four months since they welcomed him to the president's chair, but he had long been a member of the Society. Mr. Donald was not a specialist in any branch of archæology, but he was well acquainted with the trend of archæological science and had a thorough grip of the principles upon which antiquarian investigation must proceed. While a rapid and vigorous worker himself, he had the art of getting others to work likewise, and many a paper the Society owed to his good-humoured and persuasive solicitation. Mr. Donald was the founder and the heart and soul of the Regality Club. He was the author of many of its papers, and all the others were written on his suggestion. Mr. Donald had excellent opportunities for learning all that was to be learned by tradition of the leaders of city life in the last three or four generations; but he never relied upon tradition if it was possible to substantiate a statement by documentary evidence, and many an hour he spent in investigating complicated titles and obscure records in order to verify a fact. The result was a series of graphic and accurate accounts of the Glasgow of last century. Mr. Donald was as active in the field as in the study. Those who accompanied him on Saturday afternoon rambles, or on longer walks in summer-time, would remember him as the cheeriest of companions. It was perhaps only after a while that they realised how much they had learned from him, and how his quiet enthusiasm and crisp way of putting things had aroused their interest in archæology. Had he lived he would have proved a most valuable head to the Society. He could not have failed to lift them up and impart some of the fresh and vigorous life which he himself enjoyed to the full. As it was, they could only mourn their loss. He therefore moved that they place upon record their sense of the great loss which the Society had sustained by the death of Mr. Donald; their appreciation of his services to the Society, and their sympathy with his family in their bereavement.

Mr. J. Dalrymple Duncan, hon. secretary, in seconding the motion, referred to Mr. Donald's varied and valuable services to the Society. The late President, he said, possessed all the qualifications of an archæologist—wide reading, calm judgment, untiring energy and the gift of a fresh and attractive literary style. Unfortunately the engrossing demands of his business prevented him from being able to give to the subject the time which in other circumstances he would have devoted to it. By his death Glasgow had sustained a great loss, a blank had been made in the ranks of the profession which he adorned and a heavy blow had fallen on the Society.

Dr. J. O. Mitchell also spoke in appropriate and feeling terms of the loss they had sustained by the death of Mr. Donald.

The motion was adopted.

Mr. George Neilson read a paper on "Caudatus Anglicus: a curious Mediæval Slander." Mr. Neilson dealt with the origin and history of the term "Caudatus Anglicus" applied to Englishmen. It was shown to have been in use from the end of the twelfth century, invariably applied to Englishmen, and in a great mass of cases in conjunction with

sarcastic references to the possession of tails. Divergent theories had been propounded to explain this remarkable middle-age belief. The two most important were, first, an etymological explanation which accounted for *caudatus* as signifying a coward and connected with a tail between the legs. The other explanation was that given by Mediæval chroniclers and ancient legend. These latter authorities said that when St. Augustine came into England the inhabitants of a southern county mocked him by affixing fish-tails to his garments, and that in divine revenge the inhabitants of the district ever afterwards carried tails. Many citations were given showing the use to which this epithet was put, being frequently applied by Frenchmen and by Scotchmen to Englishmen, and forming a somewhat spicy part in the epigrammatic quarrels between representatives of these antagonistic nations. Mr. Neilson's opinion was that the etymological explanation was inadequate, and that the term was the evidence of a widely-existing belief of early ages that in certain parts of England men had been punished by the infliction of tails.

THE PORTRANE ASYLUM COMPETITION.

THE design of Mr. G. C. Ashlin, R.H.A., has been selected for the new asylum which is to be erected at Portrane, near Dublin. An article on the subject appears in the *Irish Times*. It runs as follows:—

In order to complete the later history of the competition, and elucidate its announced ending, we must go back to the report of the committee of selection. They were appointed to take three out of the designs sent in, and to "place them in the order of merit." What they said was this:—"With reference to the designs we have very carefully examined the twelve sets of drawings submitted, and while we consider that they reflect great credit on the authors, showing that much time and attention have been bestowed on their preparation, we regret to say there is evidence of but little experience in asylum planning, and we have great difficulty in selecting three designs which adequately fulfil the conditions for a well-arranged asylum." Nevertheless, they did thus name the three following designs, viz. "Luna," "Mens Sana" and "Aspect." "But," they added, "we cannot recommend any one of them for adoption without very considerable alteration, and therefore we propose to bracket the three designs together, leaving the final selection in your hands." Thus the Board of Control had three designs in the largest sense of equal merit, though in some particulars all alike were defective. They have now taken a course which can hardly be pronounced to be fair altogether to the two rejected designs in selecting the most expensive of the three, giving to its author the liberty of amending it, and of reducing the outlay—it is said by 40,000*l.*—a liberty substantially of re-tendering which in no shape has been conceded to Mr. Rawson Carroll or Mr. Kaye-Parry, though their claims stood equal with that of Mr. Ashlin. The decision has thus been conveyed:—"The Board of Control have given the selection their most careful consideration, and have decided on accepting the plans furnished under the motto 'Aspect.' As the three designs referred to were bracketed by the assessors, the Board have decided to divide the amount provided for premiums, 225*l.*, into three equal sums of 75*l.*, and have ordered payment of that amount to be made." The case consequently stands thus:—That of three equal plans the most costly has been selected. Secondly, the least attractive plan as to expenditure is to be, as we have heard, cut down to somewhat near the level of the plans that competed with it. Thus a merit is communicated to it by a special concession which before it did not possess. But no privilege corresponding in any way to this was offered to the other architects, enabling them to alter their designs in an iota. When, accordingly, the Board came finally to make a choice they appear to have done so as between two of the "equal three" plans unchanged and unmodified and one other altered, we are in no position to estimate to what extent, though we must infer that it is considerable, from the reported amount of the reduction in cost. Whether any more useful or satisfactory arrangement than this could have been made for a combined service we cannot suggest; but those who presented the designs that are now rejected have, we feel, reason to complain that any privilege of modification should have been given from which they were excluded. The Board, many will think, when they determined to allow an architect to amend should have gone the full length of permitting the three equal architects to offer their plans afresh, with changes in them within certain limits not affecting their principle or the original conditions. Those concerned in the paying part of the matter would like to know what the Portrane Asylum is really to involve in the way of outlay, and whether the "Aspect" plan is, as now is stated, to be lessened to 200,000*l.*, a sum beneath that of the two other plans which in its original form it so much overtopped.

THE HALLUM BRASS, CONSTANCE CATHEDRAL.

AT the foot of the steps leading up to the high altar in the cathedral of Constance there is a monument particularly interesting to the English, on account of its connection with the history of their country.

It consists of engraved brass plates let into an oblong-square stone slab, about 9 feet by 5 feet in dimension, and represents the effigy of a bishop in the costume of the fifteenth century standing in an arched niche, which terminates upwards in a crocketed canopy, having on each side of it an escutcheon.



That on the dexter side contains the royal arms of the Plantagenets—quarterly, France and England, surrounded with the Garter of the Order of St. George and its device, "Honi soit qui mal y pense." The other, on the sinister side, probably contained (for the metal within the border of it has been removed) the private arms of the bishop, impaled with those of his see, and is surrounded by a scroll, in which appears in Gothic characters the words, "Misericordias Domini in eternum cantabo." At the sides of the niche are two pillars ornamented with Gothic panels, in each of which is the figure of an angel, and the whole is surrounded by a square border (separated from the other part of the monument by an intervening space of stone), which exhibits at each corner an ornament, in the centre of which is a figure, much defaced, but which seems to have been the representation of a dove, with a halo round its head, bearing a scroll, and probably intended to signify the Gospel proceeding from the Holy Ghost. Such a figure can

be clearly made out on the ornament at the bottom left-hand corner of the border, and it seems as if the other figures were merely varieties of that which has been particularised, and are the usual emblems of the four Evangelists.

The epitaph which appears on the border is in letters of a different character to those around the escutcheons. It sets forth the qualities of the deceased and the year of his death in the following quaint manner:—

✠ Subiacet hic stratus Robert Hallum vocitatus : ✠ Quondam p̄latus Sax sub honore creatus Hic decretoꝝ doctor pacis q̄ creator : Nobilis angloꝝ Regis fuit ambaciator : ✠ festu cuthberti septembris mense vigeat : ✠ In quo Roḡti mortem Constantia flebat : Anno Miffeno tricent octuageno : Sex cū ter deno cū x̄po uiuat ameno. ✠

The day of the bishop's death then appears to be the feast of St. Cuthbert, that is, September 4, 1416, for "Anno milleno tricent et octuageno" brings us to 1380, to which add six and thrice ten, "Sex cum ter deno," and the product will be 1416. It may be here remarked that the word "Christo" in the original inscription is contracted and expressed by an equivalent for the Greek characters ΧΡΟ, that is to say a Gothic α for the Greek χ (χ), a ρ for the ρ (ρ), and an \omicron for the \omicron (\omicron). Over the head of the effigy, in the quatrefoil of the canopy, is a rose in the centre, around which are the letters R. O. B. S., which may have been intended to denote the four principal letters in the bishop's baptismal name—Robertus. On the upper part of his dress, on the collar of the chasuble, there are two Gothic letters which look like A. V.

A notice of Bishop Hallum's death is contained in an old printed book dated 1483, and written in German, by Ulrich von Keichenthal, under the title of "Consilium von Costnitz." The translation is as follows:—

"On the fourth day of the first Harvest month, happened a Tuesday during which, VIII hours after midday, towards the night, there died the highly worthy Prince Bishop Robert of Salisbury from England, in the fortress Gotlieben; and on the morrow about vesper time there they conducted him to Constance, and they bore him with two golden cloths into the Minster, and thither went all Cardinals, Patriarchs, Archbishops, Bishops—our Lord the King—all spiritual and temporal Princes, prelates and priests, and with them a great crowd, by [the light of] LXXX of the largest-sized burning tapers—which poor old men bore—and they sung him a Vigil, and he was buried in the choir with the other Bishops; and they had for him there no offering."

According to the report of the sacristan at the cathedral of Constance, grounded on generally-believed tradition, the brass part of Bishop Hallum's monument was manufactured in England, and sent from thence to cover his remains. If this indeed be true it is an interesting fact, for it affords a presumption that in the early part of the fifteenth century our brass-engravers were reputed to be superior to those of the Rhenish cities, where the thing might have been executed without incurring the charge of transport and the risk of damage which must have attended any shipment from England. Certainly, the art of inscribing on brass does not appear to have been cultivated for this purpose so much in Western Germany as with us. There are effigies cast in brass and plated with it to be found, and we are informed that most of these are believed to have been executed at Nuremberg, where brass-founding is said to have been cultivated with success and at an early period. But in the many churches on and about the shores of the Rhine such a thing as an engraved plate monument of the early part of the fifteenth century is not to be seen. Perhaps the form of the escutcheons over the head of the bishop's effigy may be adduced as very slight evidence of English workmanship, for that form was prevalent in England in the year 1416, at which period the Germans had begun to adopt another, somewhat different, in depicting heraldic achievements. The garter and garter-like scroll, too, which surround the escutcheons, are peculiar to England. These little traits, although they do not amount to conclusive proof, give nevertheless an air of probability to the tradition. Indeed, no reason for disbelieving it can be founded on the general appearance of the monument. The inscription on its border was probably executed in Germany, for the letters of which it consists are very different to those round the escutcheons, on the collar and over the head of the effigy, and they resemble at the same time those which one often sees in Germany on gravestones of a contemporary date. Why the royal arms should appear on the monument in question is not known, unless it were to show that the bishop, when he died, was the king's representative.

Mr. Benajah W. Adkin, F.S.I., of 14 Queen Street, Chapside, E.C., has opened a branch office at No. 493 New Cross Road, Deptford, S.E., for the convenience and extension of his practice in the S.E. district.



THE RECORD OFFICE.

AS the new buildings of the Record Office, on the site of the Rolls Chambers, are approaching completion, we give a view of the original design, which was prepared by the late Sir J. Pennethorne. It will be observed that some parts differ from what is to be seen in Fetter Lane and Chancery Lane, especially the towers.

TESSERÆ.

Architecture and Painting.

SOME painters, instead of making architectural buildings serve as an ornament to their landscapes, completely spoil their compositions by great abuse of resources which it affords. Amongst these may be mentioned Marco Ricci, Lingelbach and sometimes Pannini. They availed themselves of their sojourn in Rome to copy the numerous monuments of various periods which there abound. This they did, however, without taste and discernment, and in their pictures they introduced promiscuously, and in the greatest confusion, monuments of different periods, of different styles of architecture, indeed of the most opposite character, accumulating these incongruous elements with a confused profusion of which Rome itself does not afford an example. In some instances they rendered this heterogeneous assemblage more ludicrous by intermingling figures of different dates and costumes with the ruins. Modern landscape-painters have devoted themselves more exclusively to nature herself, and have availed themselves generally in a less degree of such means of embellishment as architectural buildings afford. However, the French marine artist of the last century, Joseph Vernet, introduced architectural buildings, especially lighthouses, bridges and aqueducts, with great taste and effect, and his English contemporary, Wilson, realised corresponding advantages by the ruins of such monuments. Turner, when not led by the fascinations of colour to neglect the resources of ornamental form, availed himself most advantageously of the decorative beauty of architecture in his landscapes, as may be seen by the grace and elegance which his picture representing *The Building of Carthage* derives from its architectural monuments. John Martin so completely commanded the resources of architecture that he thereby imparted a character of combined splendour and vastness to his compositions. In some of his pictures ancient cities surprise the observer by their extent, their remarkable situation, and the originality of the buildings. In others, as in *The Feast of Belshazzar*, it is the magnitude of the palaces and other edifices which causes admiration. In these subjects a style of architecture has been adopted which, though to some extent ideal, at least carries the mind at once to the time and the place of the event recorded, an attempt which had not been made by the landscape-painters of olden times, and which,

although till lately quite new in this branch of art, Martin carried out with the most complete success.

Caprice in Design.

It is very common for people to set down at once for caprice whatever deviates from general rule and usual method, thereby perplexing that ordinary and petty criticism which has no other standard of judging than established routine precepts, interpreting them, moreover, to the very letter. Such criticism is unable to discriminate between what is mere caprice and what is not, wide as is the difference between them. The capricious is that for which no satisfactory reason can be assigned by the author of it, but however contrary it may be to usual practice, that is not caprice which is done with deliberate intention and well-studied aim at effects previously untried. And if to do well merely according to precedent be meritorious, much more must it be to do so and at the same time go beyond actual precedent, creating what in its turn will be recognised as valid precedent and authority. It is proper enough to be perfectly well acquainted with precedent, but to be tied down to it, to be made a slave to it, is ill. Those who are incapable of thinking for themselves take refuge in precedent, and make it their stronghold, since it enables them to assume a tone of authority, and to decide dogmatically without any trouble of thinking. Careful observance of rules will enable anyone to avoid positive faults, but between them and positive merits there is an immeasurable distance, one which defies calculation. In art it is very possible to be at once faultless and valueless, without any specific fault, but also without any interest or any charm—in a word, to be altogether humdrum. Perhaps it is rather unfortunate than not for architecture that a great deal of humdrum is of necessity tolerated in it; however worthless or unworthy they may be as productions of architecture, buildings may as buildings completely answer the purpose for which they are erected. Besides which they must when once erected remain indefinitely to the discredit of the art and the corruption of public taste. Humdrum poetry becomes serviceable as waste paper; humdrum pictures find their way into lumber-rooms and garrets, but buildings of the same or even worse quality cannot be so got rid of or put out of sight; otherwise a good many that might be mentioned would now disappear.

Decay of Granite.

The decomposition of granites takes place from the action of the atmosphere upon their constituent particles. "The quartz is almost pure silicious earth in a crystalline form. The felspar and mica are very compounded substances; both contain silica, alumina and oxide of iron. In the felspar there is usually lime and potassa; in the mica, lime and magnesia. When a granitic rock of this kind has been long exposed to the influence of air and water, the lime and the potassa contained in its constituent parts are acted upon by water and

carbonic acid; and the oxide of iron, which is almost always in its least oxidised state, or in that of the protoxide, tends to combine with more oxygen; the consequence is that the felspar decomposes, and likewise the mica, but the first the more rapidly." Such are the words in which Sir H. Davy describes the mode of decomposition of granites, and they may be taken to express the present state of science so far as the granites usually employed in England are concerned. But there appear to be different conditions in the combinations of the bases of felspar which give rise to some apparent anomalies. Thus the Egyptian porphyries, which contain a notable excess of rose-coloured felspar, resist the influence of the atmosphere in an extraordinary manner. Possibly this may be accounted for by the closeness of the grain (so to speak), which would to a certain extent prevent atmospheric moisture from communicating with anything beyond the immediate surface; or the more simple character of some of these porphyritic rocks may be favourable to their preservation; whereas the different rates of expansion of the ingredients must have a material mechanical influence in disintegrating rocks when they exist in considerable numbers. The difference between the rapid rate of decomposition of the porphyritic granites of Spain, Brittany and Cornwall, and that of the Egyptian specimens, appears to justify the inference that the cause last suggested has great influence upon their durability. The former are, in fact, composed of a greater number of ingredients than the latter, in which both mica and hornblende are wanting.

Colour in Architecture.

The subtle and delicate properties of form are truly worthy of occupying the mind of the artist, but there is no æsthetic reason why they should exclusively demand his allegiance. In later times the architect and the sculptor have limited themselves to the speciality of form apart from other properties, and yet on no valid ground, not even on the ground of precedent. It cannot now be denied that in all other ages than the last two or three centuries architects and sculptors have dealt largely with colour as well as with form, and have not thereby felt themselves degraded. Painters vary in their appreciation and application of the properties of form, yet no one thinks the worse of Michel Angelo or Raphael because he painted as well as drew cartoons. There is not one argument, indeed, for the exclusion of colour from architecture and sculpture which does not equally apply to painting. There is an enjoyment derivable from the properties of colour apart from form, which in its abstractedness is as pure as that derivable from the properties of form. The restriction of the practice of art to the latter has nevertheless no better basis than a vague, mystical notion, which seizes the more readily on some minds in proportion to its want of consistency and definedness. If purity of form is enhanced by being enjoyed alone and by being exhibited isolatedly, then an outline cartoon must be the height of pure art; and it may be submitted to the purists whether the play of light and shade which, both in architecture and sculpture, contribute so highly to effect, do not, like colour, impair the pure enjoyment of abstracted form. The more catholic the appreciation of the beauties of nature and of the resources of art the higher aimed will be the exertions of the artist, and it is equally honourable to him to work with slight materials or with small material. How anomalous is that law which would restrict an artist to marble and stone, and those only of one colour, and who require that his structures shall be of the greatest proportions and of the most durable materials, and yet will assign the honours of immortality to the designer of an altar-piece, nay, even of a cabinet picture. After all, there are more painters known to the world than there are sculptors, perhaps as many sculptors as there are architects whose names are in the mouths of the many.

Iron Manufacture in England.

The principal ancient seats of the iron manufacture in this country appear to have been in Sussex and the Forest of Dean, or Arden, as it was then called. It is known that ironworks existed in that part of Gloucestershire in 1238, because there exists among the patent rolls of Henry III. of that date one entitled "De forgeis levandis in foresta de Dean." Remains of ancient iron furnaces have also been found in Lancashire, Staffordshire and Yorkshire. The ironworks in the Monmouthshire hills now extend about twenty miles, and mineral property here has risen from 5s. an acre surface-rent to 1,500s., or more, underground. In the vale of Taff, before the seventeenth century, rude attempts were made to smelt iron ore; the bellows was worked by a water-wheel, and charcoal used instead of coke. Merthyr, the "iron capital" of the district, is scarcely a century old. Here, at the Cyfarthfa works, are employed upwards of 4,000 men, including colliers, and the strata of coal lie parallel with veins of argillaceous iron ore. This is the great seat of the bar-iron manufacture for railways. The chief ironworks of Sussex were in the Wealden strata, whence the iron ore was extracted from the argillaceous beds, and was smelted with charcoal made from the abundance of

wood. At Buxted, near Lindfield, iron ordnance were made three centuries since. Up to 1720 Sussex was the principal seat of the iron manufacture in England; the last furnace, at Ashburnham, was blown out in 1827. Kent was alike noted for its iron, and the last great work of its furnaces was the noble balustrades and gates which surround St. Paul's Cathedral, London; they were cast at Gloucester Furnace, Lambeth, and cost upwards of 11,202s. In the Middle Ages, and down even to a late date, while Dudley and Wolverhampton were obscure names, the forges of Kent and Sussex were all aglow with smelting and hammering the iron which the soil still yields, although it is not worth the while of anyone to work it. The discovery of the coal-fields of Wales and Staffordshire gave the Kent and Sussex furnaces their death-blow, leaving the country dotted with forge and furnace farms, and deep-holes, now filled with tangled underwood, from which the ore was brought. Kent and Sussex have no coal, and the iron manufacture left these counties when smelting with coal or coke began to supersede smelting with charcoal.

Caen Stone in Caen.

The lofty pinnacles and spires of Caen, and the solid high square towers which rise up in the clouds, defying the fury of the elements, for many years exposed to storms, hail, rain, snow and frost, acted upon by all the alternations of heat and cold, wet and dry, present a sharpness of arris and smoothness of surface, as seen from below, that prove a considerable degree of hardness in the stone of which they are constructed. Less reliance can be placed upon the indications on the parts within reach, for exposed as they have been to the Vandal wantonness of the revolutionary frenzy of destruction, and the Calvinistic zeal of misguided religious feelings, there are many of the lower parts broken away and considerably worn. But the attenuated and refined details of some Renaissance finials, pinnacles and flying buttresses in the lady chapels and apsidal altar-ends of the churches of St. Pierre and St. Sauveur and St. Sauveur-le-Marché of the beginning of the sixteenth century, more minutely enriched and elaborately carved and subdivided than even the most refined details of the flamboyant parts near them, are as fresh and sharp as if executed within the last fifty years. Time and weather have not had on the monuments of Caen the same corroding hideous influence as on the edifices of Chester, Coventry or Oxford. The graceful spire of St. Pierre, the summit of which is 250 feet above the market-place, and itself more than 100 feet high, does not appear to be thicker than 9 inches in the lower part, and is reduced, it is said, to 4 inches thick at top. The immense weight and exposed situation do not seem to have affected it in the least degree; and it may be quoted, if not for size, at all events for its grace, daring construction and state of preservation, after nearly six hundred years' trial, with its sister spire of Salisbury erected at the same period.

Influence of Contemporary Art on Students.

The minds of students are much more impressed, in the commencement of their studies, by the production of their contemporaries than by the works of the old masters, and these early impressions are never wholly eradicated through the longest life. There may be seeming exceptions to this, but there are very few real ones. That contemporary art is the first to impress us may be advantageous or otherwise, according to circumstances. Its advantages need not be dwelt upon, as such influence stands in no need of recommendation; but it may be useful to point out some of the dangers of what is certainly a habit with students resorting to annual exhibitions as a school. In an assemblage of the accidental productions of a year, and with which it is necessary to cover every inch of wall, there must of necessity be a great preponderance of the indifferent and even much of what is positively bad, and inexperienced eyes cannot dwell often and long on this without injury. The student is apt to thank his stars that he can do better than much that he sees, and contents himself with respectable mediocrity; and the more so as it is found that mediocrity, managed with ordinary tact, may secure patronage and even fortune, while unworlthy genius is often neglected. There are no topics more frequently dwelt on by writers and talkers than the faults of the age, and yet nothing is so difficult to understand. But to the student it is of the last importance that he should see clearly what are the besetting sins of the school to which he belongs. These, it is very true, are to be seen in their fullest luxuriance in annual exhibitions; but there is danger to the student, if he resort frequently to them for instruction, that he may become hopelessly blind to the mannerism of the day.

Single Style Zealots.

Those who admire one style of architecture are apt to be not merely indifferent to, but intolerant of every other. The lover of pure Greek architecture sees only the corruption of it in the Roman style, and of this latter, the degradation in the Italian. His standard of excellence is the Parthenon, and by that

standard he tries everything else, no matter how different may be the principles upon which it is constituted. He would have Greek-Doric temples spring up everywhere throughout the length and breadth of Europe and of America also. He is willing to extend some degree of favour to Ionic, that being at all events Grecian; but Corinthian is Roman, and shows a sad falling off from the manly simplicity of the earlier style. On the other hand, the lover of Roman and Italian design is equally strong both in his liking and his antipathy, holding Greek architecture to be frigidly severe and monotonous, exceedingly *borné* withal; and Gothic, together with all other Mediæval styles, to exhibit only the barbarous conceits of the Dark Ages—to be utterly devoid of "proportion," lawless, extravagant and irreducible to "rules." Such at least used to be the case, for at the present day such sweeping condemnation and insolent contempt of Mediæval architecture cannot be expressed with impunity. Gothic admirers and devotees repay with compound interest the insults and indignities which it formerly received from the Italian school and its followers. Opposite as they are in their tastes, all these parties are alike in one respect, they being all alike one-sided, prejudiced and intolerant in their antipathies, and cheating themselves out of much varied enjoyment by limiting the sphere of it to the compass of a single style of the art, instead of sympathising with the beautiful and intrinsically æsthetic in architecture, whatever may be the particular form under which it presents itself or the name to which it answers.

Blake, Barry and Terburgh.

Few men had more imagination than the amiable visionary Blake. No mind could be loftier in its aspirations than his—no heart more pure. He conversed daily with angels—he wrote poetry that Charles Lamb called glorious and Coleridge quoted by heart; and, so far, he had taste as well as imagination—and taste also purified by his imagination. But his pictures, though the subjects are sublime, are too fantastic to be looked at with any seriousness; for by a singular perversity of judgment he was led to associate sinfulness with the pleasure of the eye, and he spoke of being haunted by demons in the shapes of Titian, of Correggio, of Rubens and of Rembrandt, tempting him to commit light and shadow and to be guilty of colouring. Blake was mad, but this does not affect the argument, for madness is but an unbalanced mind, and the power he wanted was judgment—the better part of taste. Blake was but an extreme specimen of what is always more or less the result of the undue predominance of the imagination—and which as far as it throws off the control of judgment produces what may be called the fanaticism of art. Barry may be quoted as another, though a less extreme, instance of an extraordinary man devoting himself to a great object, and wilfully rejecting much assistance of the highest value. He spoke of the Dutch and Flemish painters, including Rembrandt and Rubens, as out of the pale of his church. And what is the result? He expended six years of thought and labour in the production of a series of pictures of high moral aim—but so deficient in the attributes of art that, though they may be acknowledged as the productions of genius, no power of reasoning will ever persuade the world to admire them. To Blake and Barry we may oppose, by way of contrast, Terburgh, as a painter of the least possible imagination, and whose works exhibit no remarkable degree of purity of mind. We must deduct, therefore, from his taste, all by which imagination and fine feelings might have exalted it. His subjects have rarely anything to interest, and we may be thankful when they have nothing in them to disgust; for he often descended to incidents of the most repulsive kind—a well-dressed woman, for example, tipping by herself, and in the act of draining a long Flemish glass, while she holds a stone bottle on her lap. Yet such subjects, and others little better, from his hands, are made gems of art by the exquisite taste of the colour, execution and light and shade with which they are recommended to the eye; and Terburgh ranks with great painters and is of a class from which Reynolds did not disdain to learn, and Raphael would not, could he have seen its productions; while the works of Blake can scarcely be said to belong to the art, and those of Barry, from their lamentable deficiency in all that can satisfy the eye, must take a rank far below the productions of the painters he most despised of the Dutch and Flemish schools.

Rosewood.

In seeking for wood of a fine figure special attention is to be paid to the appearance of the annular rings, as seen in the ends of the planks. When the concentric circles of red and black are found regular, or only slightly irregular, much show or figure is not to be expected. But when, on the contrary, they are found in waving and tortuous lines, a good figure is certain to be found. Another indication of fine figure is the plank being marked by knobby protuberances, which, when pierced, are found of a light colour. These, when intersected by the straight line of the veneer saw, produce an abrupt dash

of light, which contrasts very agreeably with the sober aspect of the general surface; and, therefore, planks having these knobs and other indications of figure should be carefully selected for veneers, while the plainer pieces are reserved for chair wood, couch-feet and scrolls, table-pillars and claws, and solid work generally. In cutting up veneer planks regard must be had to the form of the concentric circles in order to bring out the best figure which the plank is capable of exhibiting; and this object will be best secured by making the saw-draughts run as nearly as possible parallel to the circles. In drying rosewood, it is of importance to take care that it is neither exposed unsheltered to the rays of the sun nor suddenly to artificial heat, for either will have the effect of producing cracks, which, even although they close, cannot be concealed in the finished work. To make good furniture of this wood it is especially necessary that it be gradually and thoroughly seasoned, otherwise it is sure to betray the neglect afterwards. Another peculiarity of rosewood is, that much of it is very porous, and that the pores are elongated on the surface in a way that renders it difficult to produce a good solid body of polish on it. To remedy this, various plans have been tried. Size of various kinds has been employed to fill in the pores, but although well papered off, it furnishes a very harsh and ungenial surface to polish upon, and shrinks below the surface afterwards. Blackened bees'-wax has been rubbed in and then cleaned off, but this has the effect of preventing the polish from getting properly rivetted in the wood, and causes it, when the article is in use, to peel off on the least friction. The best remedy yet discovered is, after the surface has been finished by the cabinet-maker, to rub it carefully in with plaster of Paris, coloured with rose-pink, which, after being set, is to be carefully papered off. This does not shrink like the size, and has the effect of preventing the oil used with the French polish from finding a hiding-place in the pores, whence it afterwards exudes on exposure to the air, and eats off the polish like rust on a metallic surface. The dull brown colour of a large portion of rosewood has led to a variety of experiments to improve its appearance. Some have tried the dyeing of it with successive coatings of an infusion of logwood, but the effect is so unsatisfactory as not to repay the trouble. Others have used a strong solution of gum-dragon or dragon's-blood as it is commonly termed. This produces a very enlivening effect in superinducing a rich purple hue on the dull brown of the wood, but it always presents the appearance of a thick coloured or painted medium being interposed between the spectator and the wood. It is preferable to make use of a vegetable colouring, such as the extract of camwood, or other dyewood of the required tint, which in solution with spirits of wine, produces the desired change on the colour of the wood without suggesting the idea of its being painted.

Repousse.

A sheet or disc of metal having been selected, the artist sketches his design on the reverse side to that which is intended to be the finished work. He proceeds to raise the various projections by a series of punches, &c. When he has obtained the necessary convexities which he thinks will give sufficient relief to the subject and will look well, he fills the back of the work up with a mixture of pitch, rosin and sand, and attaches it to his chasing block or ball. He then works on the convex or right side with his chasing tools, with these adding the details of features, drapery and foliage. Any roughness is removed by means of rifflers; the work is then polished and thereafter burnished, gilt or parcel gilt. In this class of art the Italian gold and silversmiths of the fifteenth and sixteenth centuries were adepts. The art was revived in France in 1838, and has ever since been practised with success. In our own country Pugin, in his efforts to revive and improve the character, taste and style of ecclesiastical metal-work, introduced anew the art of beating up.

Motion in Painting.

In its highest flight art can only suggest motion. Those artists who try to represent it are guilty of an artistic solecism. They can, however, render it as commencing or finished, the threatening gesture, but not the descending blow; the intended, but not the actual movement; the effects, but not the action itself; a fallen stone, with the consequent injury, but not a falling stone. Such representations violate good taste, because they break natural laws by making immovable, as must result in art, a thing in motion. Consequently we perceive a painted and sculptured falsehood. This affects good taste as painfully as a lie does the moral man. But we may legitimately suggest motion, as in running water by its ripples, a wind by the direction given to all flexible objects on which it operates, and in animated nature by the natural position which hints at the coming or completed action. It would never do in representing a man walking to leave one foot suspended in the air; yet we continually see artists of repute, as the world judges, guilty of infractions of the laws of art as gross as the above example.

NOTES AND COMMENTS

THE report of the Sussex Archaeological Society announces that the year has been prosperous. It also mentioned that on October 10 a visit was paid by the members of the committee and a number of subscribers to Hastings Castle, when the dungeons were inspected and described. The museum was also examined, and the visit was most interesting and instructive. In October last a portion of the stone corbelling supporting the south-west tower of the barbican suddenly gave way, and upon an examination being made it was found necessary to shore up the tower and close the building to the public. The owners of the castle had, the committee understood, been advised that a large portion of the tower would have to be taken down and rebuilt. This unfortunate accident not only must of necessity somewhat impair an historic building, which will always be of special interest to the members of the Sussex Archaeological Society, but has already, and must for some time yet, cause a serious falling off in the number of visitors to the castle. As the Sussex Archaeological Society was founded in 1846, its jubilee will be in 1896, and the committee would be glad of suggestions as to the best way of celebrating it, and also promises of help in carrying out the commemoration in a manner befitting so memorable an event in the Society's history. The annual summer meeting of the members will be held about the end of July in Eastbourne.

THE names of the townlands in Ireland are evidence that the country was at one time thickly planted. But trees were cut down in order that outlaws could not find shelter. In most cases, however, Celtic improvidence was, we imagine, the cause of that absence of wood which strikes every visitor while travelling. The late Dr. R. D. LYONS endeavoured while in Parliament to urge the necessity of planting in Ireland. He was not immediately convincing, but in the last few years encouragement has been given to operations of the kind. A department of Forestry Statistics has been established, which must at first offer only sinecures to the officials. From the returns it appears that in 1894 1,492 statute acres were planted with trees, of which 286 acres were in Leinster, 487 in Munster, 395 in Ulster and 324 in Connaught. In the year ended June 30, 1893, the area planted was less, being 1,111 acres. The total number of trees planted on the 1,492 acres in the year 1893-94 was 3,069,586, viz. 666,794 in Leinster, 893,475 in Munster (of which 457,128 were in Waterford), 236,590 in Ulster, and 1,272,727 in Connaught (including 1,052,253 in Galway). Larch, fir and spruce were the trees chiefly planted. The total area planted in the year ended June 30, 1894, being 1,492 acres, and the area cleared 1,675 acres, there would appear to have been 187 acres less under woods and plantations in the middle of 1894 than at the corresponding period of 1893. Of the 933,021 trees felled 397,889 were used for "propping," which appears to have been the chief purpose to which the timber of almost all descriptions was applied. As regards the disposal of 152,468 of the 933,021 trees felled, it is reported that they were "used locally," and there were 247,950 (including 174,081 in Munster) which were "exported."

THE committee of the Liverpool Corporation report that the work of the Walker Art Gallery, as regards the various exhibitions held and the attendance of the public, may be regarded as of a satisfactory and gratifying nature. The need of an enlargement of the Gallery is becoming a pressing necessity. The curator is at present unable to display many valuable and interesting art objects for want of wall space; and it is believed that owners of valuable works and wealthy citizens generally are deterred from presenting pictures on account of the obvious want of suitable accommodation. During the year the Gallery was open on 340 days (including Sundays), the total number of visitors being 469,769, or a daily average of 1,381. This total includes 66,556 visitors who paid for admission to the Autumn Exhibition, and 10,827 pupils of schools of various denominations admitted free. The Sunday attendance was 29,844, being an average of 746. The Corporation purchased *A Mower*, a bronze statue by Mr. THORNYCROFT, R.A.; *The Finding of the Infant St. George*, a painting in oils, by Mr. C. M. GÉRE; *Eve and the Voices*, by Mr.

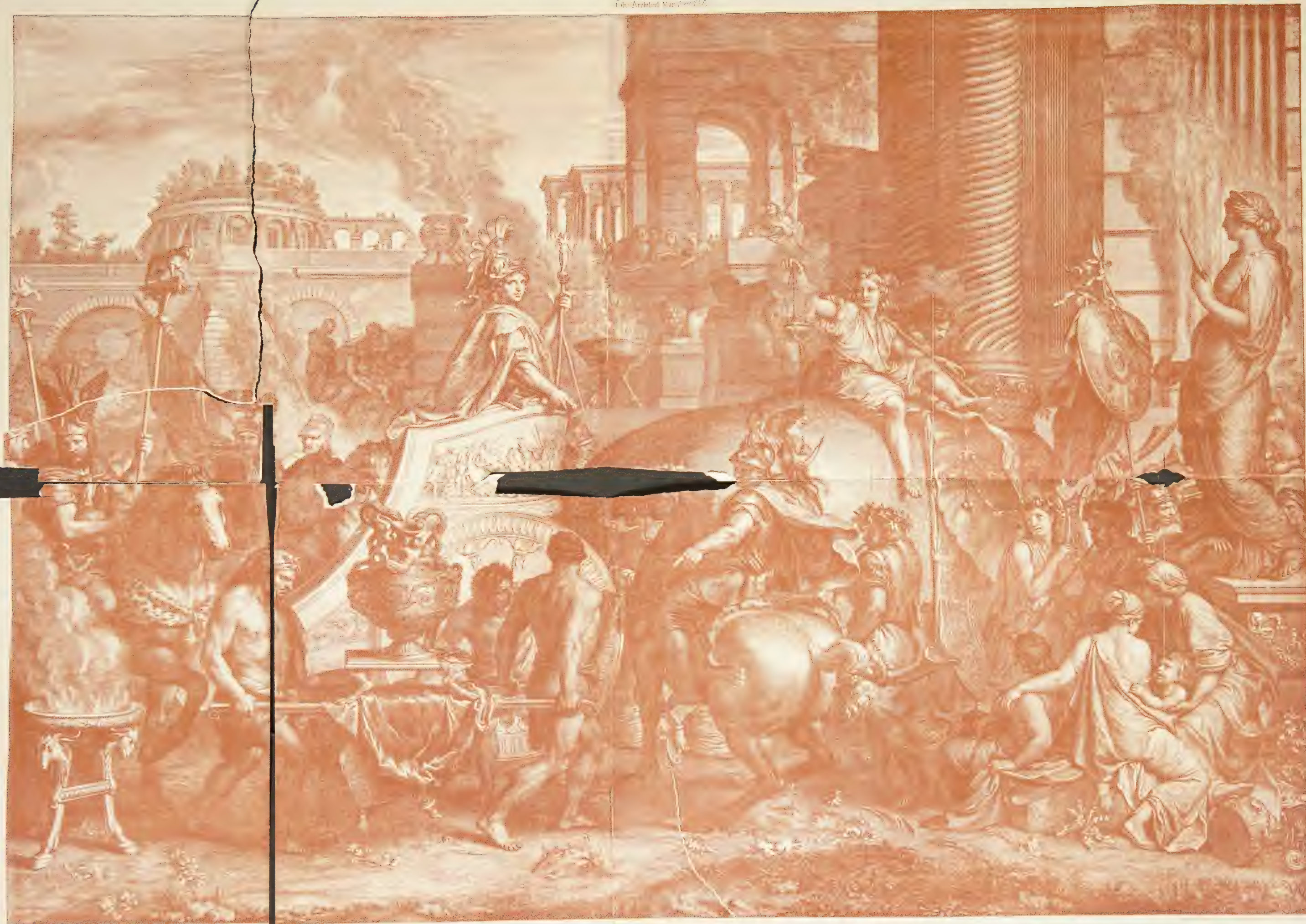
ROBERT FOWLER; *Ariel*, water-colour, by Mr. J. A. FITZGERALD. The donations to the Gallery included:—*In Clover*, by Mr. ROBERT W. MACBETH, A.R.A.; group, *Rugby Football*, plaster-bronzed, by Mr. BENJAMIN CRESWICK; *View of the Liverpool Town Hall*, by Mr. JOHN BARTER; *The Port of Liverpool*; two charcoal drawings, *Bishop of Ely* and *St. Jude*, by the late Mr. FORD MADOX BROWN.

ALTHOUGH JEAN MARC NATTIER was in the middle of the eighteenth century one of the most admired portrait-painters in Paris there are few of his works in any of the public galleries. Hence the great interest which has been excited among amateurs by the discovery of his portrait of the Dauphiness MARIE JOSEPHINE of Saxony. As at Versailles it was ascribed wrongly to another artist in the catalogue, there is no surprise that the evidence of its association with NATTIER was ignored. It was painted in 1751. The artist was then in his sixty-sixth year. NATTIER in 1715 was invited to Russia by PETER THE GREAT. But he went no further than Amsterdam, where he found the Czar. For him he painted a *Battle of Pultowa* and some portraits. PETER wished to bring him to Russia, but NATTIER declined. After 1720 he confined himself to portraiture, in order more quickly to gain money, for all the savings of the earlier part of his career were lost in the speculations which JOHN LAW inspired. The Court of LOUIS XV. and the most eminent personages of that period were depicted by NATTIER.

RAILWAY directors in France appear to care as little for the amenity of cities as great men of the same class in other countries. A few days ago M. PAUL SEDILLE with other architects and members of the Société des Amis des Monuments Parisiens, waited on the Minister of Public Works to bewail the destruction of more than three hundred and fifty trees on the Esplanade des Invalides. They were sacrificed in order to make the operations for building a railway station more easy. The French Parliament had declared that nothing was to be done which would affect the perspective of MANSART'S masterpiece, but in France, as elsewhere, all interests must succumb to the locomotive. The Minister joined in the lamentations of the Amis and informed them that he at least was resolved no structure should be raised which would diminish the beauty of the Esplanade. But he also will either have to submit to destiny or to enter into a contest not only with the railway company but with the guardians of the water-supply, and either body is stronger than any of the modern ministers.

THE architect to the Local Government Board, Mr. GORDON SMITH, appears to be an enemy to competitions. This peculiarity was made evident during the week. According to the *Leeds Mercury*, at a meeting of the Leeds Board of Guardians a week ago the proposed extensions and alterations at the workhouse were under consideration, and a resolution was moved to the effect that an architect be appointed to confer with the building committee and Mr. GORDON SMITH on the matter. An amendment was also moved that competitive plans for the alterations and extensions be invited from architects, and on a vote being taken the amendment was carried. At the conclusion of the business at the weekly meeting on Wednesday the subject was referred to by one of the guardians, who stated that on Monday afternoon, after the meeting of the building committee at the workhouse, two members of the Board had a short interview with Mr. GORDON SMITH, and when the question was put to Mr. GORDON SMITH as to whether there should be competition or the appointment of an architect, he most decidedly condemned competition; and, when asked for his reasons, gave them in a most business-like manner. In consequence it was suggested that the guardians who were in favour of competition might see their way to rescinding the resolution after hearing the opinion of Mr. GORDON SMITH. The matter was referred back to the committee for reconsideration. It would be interesting to know what are the reasons for departing from a system that has been found advantageous in so many parts of the country, and whether interference of this kind comes within Mr. GORDON SMITH'S official duties.





Ölje Arkitekt, Mar. 29th 1895.



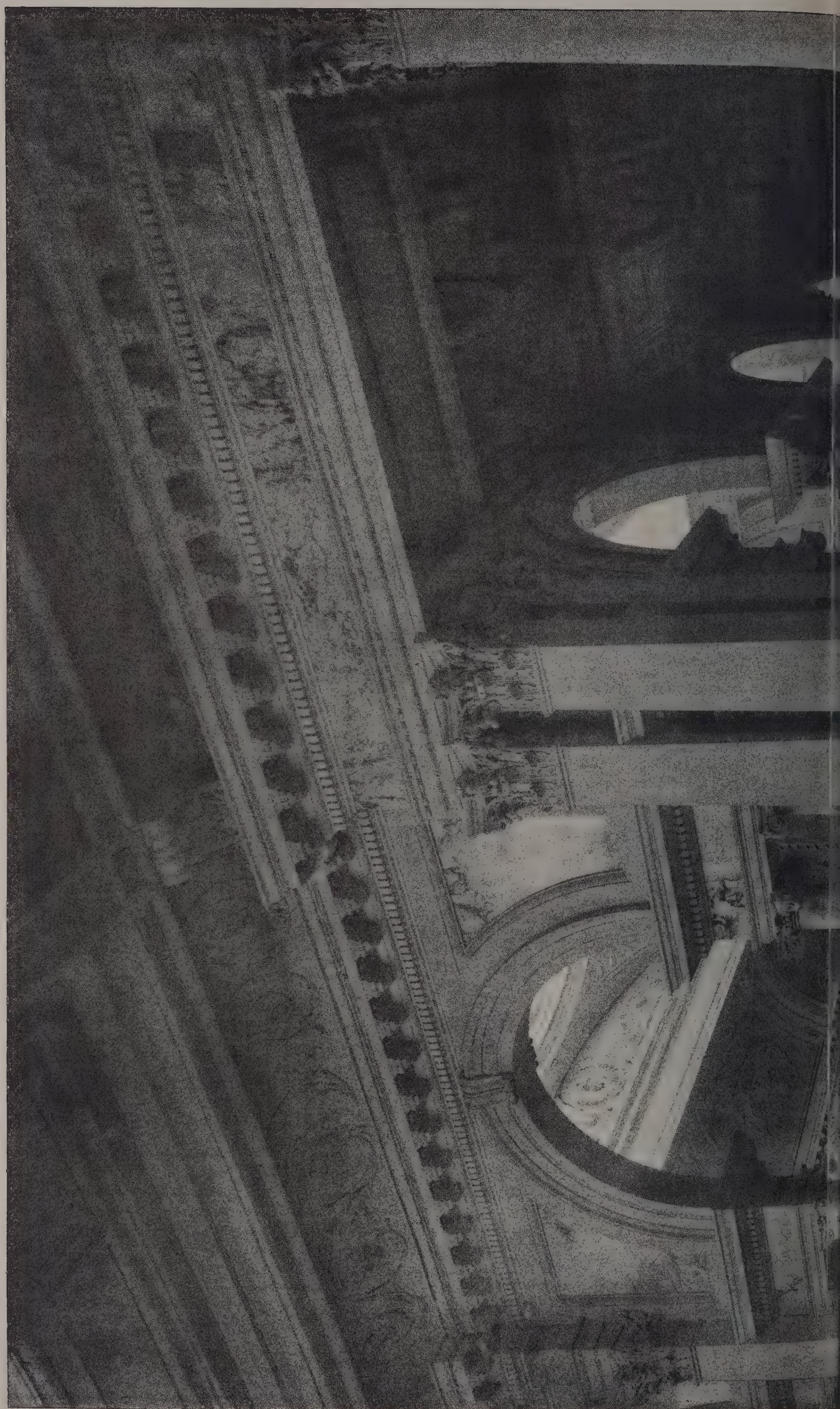


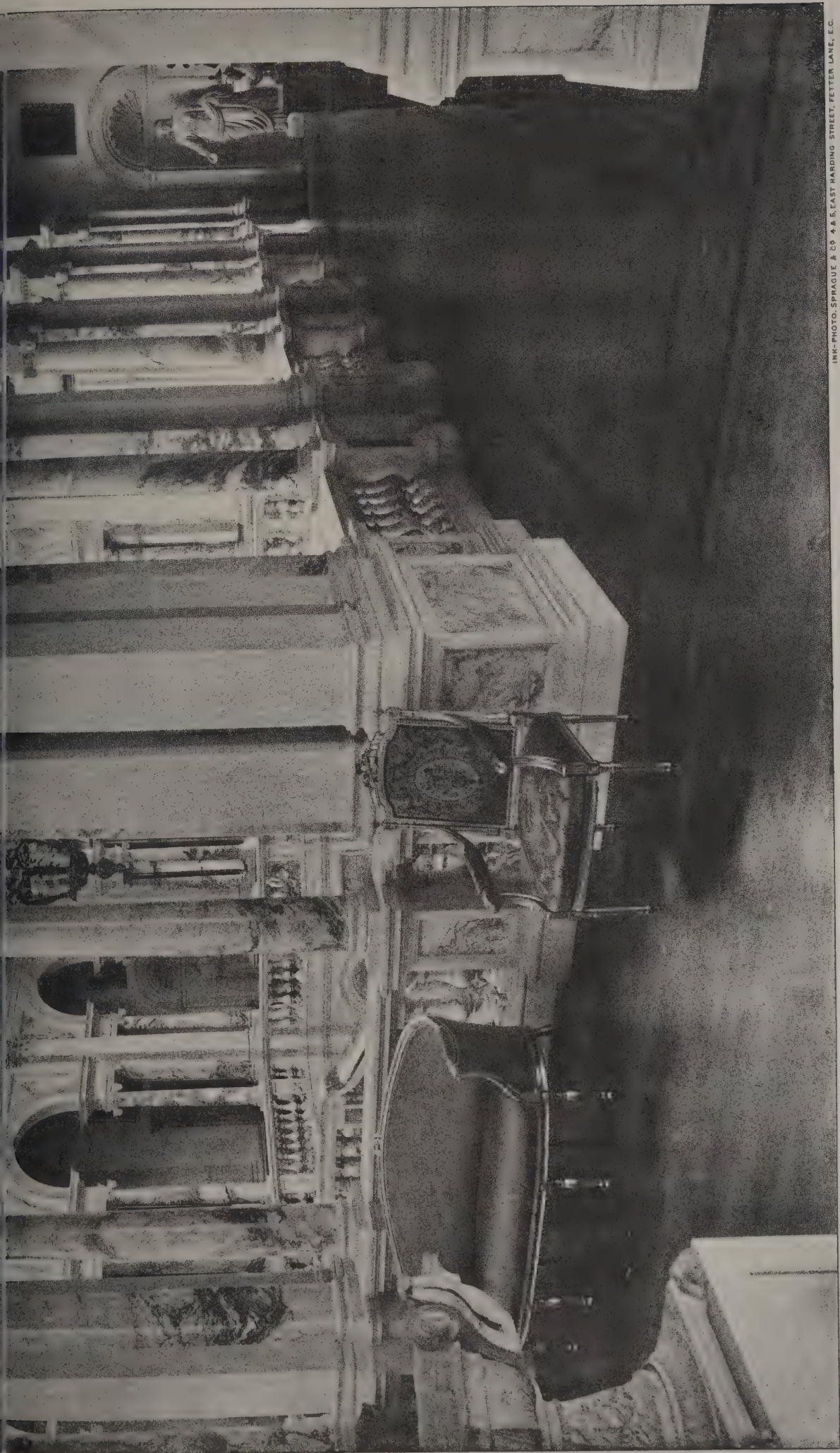
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IN 4 PHOTO SPRAGUE & CO 4 & 5 EAST HARDING STREET FETTER LANE E.C.

NORTH-EASTERN STATION HOTEL: ENTRANCE HALL.
W. BELL, Architect.

The Architect, Mar. 29th 1895.





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CORRIDOR: GOSFORD HOUSE, LONGNIDDRY, N.B.
W. YOUNG, Architect.

ILLUSTRATIONS.

CORRIDOR, GOSFORD HOUSE, LONGNIDDEY, N.B.

NORTH-EASTERN STATION HOTEL, ENTRANCE HALL.

ENTRY OF ALEXANDER THE GREAT INTO BABYLON.

THE painting from which the illustration was taken is one of five or, as some say, six, devoted to the history of ALEXANDER the Great, which LE BRUN produced about 1673. They were to be reproduced in tapestry at the Gobelins. LE BRUN was superintendent of the factory from the time when it was taken over by LOUIS XIV.

The scene at Babylon depicted by LE BRUN does not suggest the entry of a conquering hero, for all the people appear to welcome him. The artist's interpretation cannot be said to be incorrect. According to PLUTARCH, the whole province of Babylon submitted to ALEXANDER as he passed through it on his march to India. On his return it would not be remarkable if, as QUINTUS CURTIUS says, outside the city the route was adorned with flowers and crowns, that silver altars with perfumes burning on them were to be seen along both sides, nor that the Babylonian poets turned out in a body to welcome ALEXANDER with chants they composed for the occasion. If all opposition was not more vigorous than in Babylon, the reputation of ALEXANDER as a warrior would not stand on a firm basis. He entered the city, but, says PLUTARCH, "he lived mostly in his pavilion without the walls, and diverted himself with sailing up and down the Euphrates, for he was much disturbed in his mind by repeated omens." Whether ALEXANDER died from the effects of a long carouse, or from the insanitary condition of the undrained region around the city, or from other cause, is not to be ascertained.

MONTAIGNE, when he declared that ALEXANDER was one of the three most excellent men in the world (the others being HOMER and EPAMINONDAS), justified his choice on the ground that nobody else accomplished so much in so limited a time. Undoubtedly it was remarkable for a man who died at thirty-two to have conquered nearly all of what was then known as the habitable globe. His faults, too, may be condoned, as MONTAIGNE recommends, on account of his youth and the strange prosperity of his fortune. But the pride, pomp and circumstance of war have lost much of their importance in modern eyes, and if ALEXANDER is still appreciated it is on account of his efforts as an agent in civilisation. He was the means of introducing Greek ideas into a great part of Asia, and if they were not enduring in their effects he was not responsible. In return something may have been drawn from the East by his army. Moreover, he must be credited with a share in the foundation of the School of Alexandria, which for a long period held the position once occupied by Athens. On that subject the late Cardinal NEWMAN, in one of his essays, wrote :—

Alexander, if we must call him a Greek, which the Greeks themselves would not permit, did that which no Greek had done before, or rather, because he was no thorough Greek, though so nearly such by birthplace and tastes, he was able, without sacrificing what Greece was, to show himself to be what Greece was not. The creator of a wide empire, he had talents for organisation and administration which were foreign to the Athenian mind, and which were absolutely necessary if its work was to be carried on. The picture which history presents of Alexander is as beautiful as it is romantic. It is not only the history of a youth of twenty pursuing conquests so vast that at the end of a few years he had to weep that there was no second world to subjugate, but it is that of a beneficent prince, civilising as he went along, both by his political institutions and by his patronage of science. It is this union of an energetic devotion to letters with a genius for sovereignty which places him in contrast both to Greek and Roman. Cæsar, with all his cultivation of mind, did not conquer to civilise, any more than Hannibal; he must include Augustus in himself before he can be an Alexander. The royal pupil of Aristotle and Callisthenes started where aspiring statesmen or generals terminated; he professed to be more ambitious of a name for knowledge than for power, and he paid a graceful homage to the city of intellect by confessing, when he was in India, that he was doing his great acts to gain the immortal praise of the Athenians. The classic poets and philosophers were his recreation; he preferred the contest of song to the palestra; of medicine he had more than a theoretical knowledge, and his ear for music was so fine that Dryden's celebrated ode, legendary and objectionable in its subject, only does justice to its sensitiveness. He was either expert in fostering or quick in detecting the literary tastes of those around him, and two of his generals have

left behind them a literary fame. Eumenes and Ptolemy, after his death, engaged in the honourable rivalry, the one in Asia Minor, the other in Egypt, of investing the dynasties which they respectively founded with the patronage of learning and its professors.

Ptolemy, upon whom, on Alexander's death, devolved the kingdom of Egypt, supplies us with the first great instance of what may be called the establishment of letters. He and Eumenes may be considered the first founders of libraries. A library, however, was only one of two great conceptions brought into execution by the first Ptolemy; and as the first was the embalming of dead genius, so the second was the endowment of living. Ptolemy determined that his teachers of knowledge should be as stationary and as permanent as his books; so, resolving to make Alexandria the seat of a *studium generale*, he founded a college for its domicile, and endowed that college with ample revenue.

CHARLES LE BRUN was the son of a sculptor, and was born in Paris in 1619. He studied under PERRIER, NICHOLAS POUSSIN, and others. In 1642 he was sent to Rome by his patron, the Chancellor SÉGUIER. There he remained for more than four years. LE BRUN was one of the artists who took part in establishing the Académie Royale, and held all the offices. In 1649 he was selected by FOUQUET to decorate the Château de Vaux, where he met the Cardinal MAZARIN, by whom he was introduced to LOUIS XIV. His ability received a fresh development in the works which were commissioned by the king, and he became the most characteristic type of the artists whose mission it was to make LOUIS appear as a sort of demigod. Architecture, painting and sculpture in connection with the palaces are evidence of his influence, and works approved by the Grand Monarque became examples which loyal subjects were proud to imitate. LE BRUN lived until 1690.

THE WESTMINSTER FRESCOES.

DURING the session of 1894 the attention of the First Commissioner of Works was directed to the condition of the frescoes in the Palace of Westminster, more especially those in the Queen's Robing-room. Accordingly Mr. H. Gladstone consulted the President of the Royal Academy on the subject, and he advised that, in the first instance, Professor A. H. Church should be asked to examine and report upon the state of the works, who at once placed his services gratuitously at disposal. During the course of the autumn he gave much time and attention to the work, and from time to time furnished reports containing much valuable information and advice. The purpose of the Professor's commission was to ascertain the condition of the paintings and to diagnose the causes of decay, where such was found to exist, with a view to obtain data on which to found recommendations for subsequent measures of preservation and, so far as might be desirable, of restoration. Accordingly he confined his operations to cleansing the paintings, and to some limited and temporary treatment of defects. He is now keeping those frescoes that he has dealt with under observation, and has promised a further report after the lapse of a certain time, when he will be able to judge how the paintings have been affected by the processes employed by him.

In his first report, dated August 14, Professor Church says :—

On the 9th and 10th instant I again visited the Palace of Westminster. On these occasions I confined my attention almost exclusively to the paintings in the Royal Gallery and in the Peers' Robing-room.

The two water-glass (or stereochrome) pictures in the Royal Gallery are in a generally sound condition, but obscured in different degrees by a white efflorescence. The first attempts to remove this seem to have been made in the year 1875; they were repeated down to the year 1888. Subsequently a current of air from bellows only has been applied to these pictures. On repeating the process of cleaning adopted by Mr. Richmond in 1875, I found that it effected a great improvement, and that the colours were firmly adherent in those parts of the work which I examined. I am inclined to recommend that both the *Wellington* and the *Nelson* should be forthwith submitted once again to this cleaning process, which consists in flicking the surface with a soft linen handkerchief containing a pad of carded cotton. It will probably be found necessary to supplement this treatment by the use, in some places, of soft brushes. It would not be safe to entrust these operations to an ordinary workman, but I recommend that Mr. Redhead, an assistant of Messrs. Shrigley & Hunt, of Lancaster and London, be engaged. I recommend Mr. Redhead because he is an experienced and careful operator who has done excellent work under my direction when cleaning Mr. Watts's large fresco in the hall of Lincoln's Inn.

I beg now to direct your attention to the two pictures in the Peers' Robing-room. These are by Mr. Herbert, one of them, the *Moses*, being painted in water-glass, the other in oil on

canvas. Both are in a sound condition, but are dirty. The *Moses* is obscured in a few places by a white efflorescence which should be removed by flicking and brushing. Afterwards the whole surface should be cleaned by means of soft bread. I have tried this treatment upon the face and shoulder of one of the figures (a boy), and find that it restores the obscured part to its pristine beauty. The chief places where this white film exists are the crevices of some mountains in the background and some of the shadows.

Mr. Herbert's later work (completed 1880) is in oil. It requires careful cleaning with distilled water on sponges or carded cotton pads. Subsequently it should be washed with a solution of peroxide of hydrogen in water, in order to brighten some parts of the paint which are slightly discoloured. It may be expedient to coat the parts of the paint which are slightly discoloured. It may be expedient to coat the whole picture with a light coat of mastic varnish, but this operation should not be carried out if a shining surface would injure the appearance of the work. As an alternative, I should propose a very light coat of "paraffin-copal medium," which will leave a dead surface and yet bring the whole picture together and enrich its colours. I should advise that the two pictures in the Peers' Robing-room should be cleaned by Mr. Redhead under my supervision.

A few remarks as to other paintings in the Palace of Westminster may be here added. The frescoes in the Upper Waiting Hall are in a deplorable condition. So early as 1871 Mr. Horsley pronounced his work and most of the others there to be "utterly dilapidated;" he begged that they might be screened from public view. For my own part I do not think that there is enough left of them to admit of their being restored.

The paintings in the Queen's Robing-room, which have been repaired, cleaned and coated with size and then with paraffin, present many pale patches and are greatly disfigured thereby. I have deferred examining them in detail until my return to London at the end of September, when I hope to be able to suggest some remedial measures. Nor can I at present express an opinion as to the paintings in the House of Lords. I think, however, that the oil-paintings in the Prince's Chamber and in St. Stephen's Chapel would be improved by washing with distilled water in the manner previously described, cleaning with bread following.

If my recommendations as to the paintings in the Royal Gallery and in the Peers' Robing-room be approved by the First Commissioner, I will gladly superintend the proposed operations this autumn, beginning in October, say, on Monday the 1st. I should be pleased to give my services. I venture to suggest that it would be judicious to commence by treating one only of the four pictures referred to in this paragraph, and to extend the operations provided that the first experiment proved satisfactory.

In a Memorandum, No. 1, dated October 20, concerning the wall-paintings in the Royal Gallery, the Professor writes:—

The work of cleansing the two water-glass (stereochrome) wall-paintings, by the late D. Maclise, R.A., was begun under my superintendence and after a series of experimental trials on Tuesday, October 2.

The painting first operated on was the *Wellington*, which the artist completed in the year 1863. This picture, which measures 45½ feet by 12, had shown at least as early as 1872 marked signs of deterioration, for in that year Mr. (now Sir Frederick) Abel was asked to report as to the advisability of applying a solution of paraffin to protect its surface from further change. In the following year the late Dr. Percy, F.R.S., was requested to examine into the causes of the decay. In 1875 both this picture (the *Wellington*) and the *Nelson* were cleaned by flicking them with silk dusters under the direction of Mr. Richmond, R.A. In 1878 Mr. Taylor (the Board's surveyor) described the *Wellington* as most unsatisfactory in condition; subsequently Mr. Richmond repeated the cleaning as carried out by him in 1875. This treatment was several times resorted to until the year 1888, when an officer of the Board reported the *Wellington* to be in a very bad state, but *Nelson* not nearly so bad.

I am given to understand that since 1888 an air-blast from bellows has been used with the object of removing dust from both paintings.

On examining this painting in August 1894, I found that it was generally in a sound condition but obscured in many places and over large areas by a grey film, which was especially conspicuous in the shadowed and darker parts of the work. This grey film consisted of a sort of efflorescence, which on analysis proved to contain the sulphates of calcium, potassium and sodium, with traces of ammonium compounds; some silica was also present in it. Moreover, the entire surface of the painting was darkened by a deposit from London smoke.

The colours underneath the above-named films of saline matter and of soot or smoky deposit were firmly attached to the plaster, except in a very few small spots and in a large number of exceedingly minute points in the darkest shadows.

It was ascertained that these disturbances of the pigment were not increased by flicking the surface with pads of cotton-wool enclosed in old soft linen handkerchiefs, nor by sponging with abundance of distilled water. In consequence, these flicking and sponging operations were carried out with great care over the entire surface, with the result that the greater part of the grey incrustation and of the sooty coat were finally removed. The water wrung from the sponges used in the final washing was but slightly discoloured, although the first washwaters were of an inky blackness and deposited a thick sediment of the same hue on being allowed to stand.

The operations were conducted by Messrs. Redhead and Drinkwater, skilled employes of the firm of Messrs. Shrigley & Hunt, of Lancaster and London.

These remarks as to the cleansing processes and as to the condition of the paint are applicable to the *Nelson*, which was finished in 1865, as well as to the *Wellington*, with the exception that a blue pigment and a deep red pigment in the former painting were found to be rather loosely attached, and in consequence were excepted from the treatment. The operations on these two pictures occupied fifteen working days, and were completed on October 18.

During the progress of the work I was present to watch and direct the operations on ten occasions. I may add that both pictures have been greatly improved in appearance by the treatment to which they have been subjected. The obscuration of many large areas has been wholly or partially removed; numerous lost details have become visible; while the lighter parts have been brightened and the shadows deepened.

The future treatment of these important and interesting paintings remains for consideration. I should recommend that both of them should be syringed with distilled water after the lapse of a few months, and that subsequently they should be systematically freed from dust, &c., by the use of bellows and clean new feather brushes.

I am not prepared at present to advise their treatment by a preservative and waterproofing solution of paraffin wax, although its application would undoubtedly enrich the shadows and protect the surfaces. But if the grey deposit were again to be formed it would be very difficult to remove it after the application of paraffin.

But there can be no question about the desirability of maintaining a fairly constant temperature in the Royal Gallery. I attribute the deterioration of these paintings mainly to the frequent deposition of moisture on their surface, this moisture carrying with it not only suspended soot and dirt but also dissolved sulphuric acid from the atmosphere. This compound, derived from the combustion of the sulphur in coal and in gas, has formed sulphates with the basic materials on the painted surface, and has given rise to the chief constituents of the "grey film."

I cannot learn that these pictures have ever been washed * since they were first executed, although the inventor of the stereochrome method of painting recommended the liberal application of distilled water to the finished picture.

I propose to place on record in a second Memorandum some observations on the two paintings by the late J. R. Herbert, R.A., in the Peers' Robing-room. These are now undergoing the treatment which I have advised.

In a Memorandum, No. 2, dated October 26, concerning the wall-paintings in the Peers' Robing-room, the Professor writes:—

The work of cleansing the water-glass (stereochrome) picture by the late J. R. Herbert, R.A., representing *Moses and the Tables of the Law*, was begun, under my superintendence and after a series of experimental trials, on Friday, October 20. This painting, which was completed by the artist in the year 1864, was in a generally sound condition, but obscured by much dirt, and in a few places by the grey film described in Memorandum 1. It was cleaned by means of bread, but the grey film was removed by the flicking process already described. Finally, the picture was sponged with distilled water, except that the areas where a certain red pigment had been used were merely dusted with a soft brush, as the colour would have been partially removed had water been freely applied to the surface. A few small patches, whence the pigments had flaked off, were not treated in any way, but their presence does not detract from the beauty of this fine work as ordinarily seen from the floor of the room. I believe that the painting has not been cleaned since its completion, thirty years ago. That it had suffered somewhat in the course of time is evident from the statement which I find in the report on the frescoes made in 1888 by an officer of the Board, that Mr. Herbert had asked in that year to be allowed to repair it. I consider that it has now recovered to a very considerable extent its original effect.

The other picture in this room was completed by Mr.

* I have been informed that these pictures were washed with ordinary water (warmed) in the year 1875. This water, drawn from the well in the Palace of Westminster, is highly charged with saline matter, and is unfit for the purpose.

Herbert in 1880. It represents the *Judgment of Daniel*, and is painted in oil on canvas. It was first thoroughly washed with distilled water, and then the whole surface was gone over with a pad of cotton-wool moistened with a little pale drying linseed-oil free from lead, all excess of oil being afterwards removed by means of clean pads of dry cotton-wool. The effect of this treatment has been a most remarkable improvement in the colours and the general effect of the work, which may now be said to be in perfect condition.

The cleaning operations on the two paintings in the Peers' Robing-room were completed on the morning of October 26.

I venture to suggest that the *Daniel* should be framed with a wooden moulding similar to that of the *Moses*. At present the gap between the edge of the picture and its architectural framework detracts greatly from its appearance.

In a Memorandum, No. 3, dated November 23, concerning the wall-paintings in the Queen's Robing-room, the Professor writes:—

The cleaning of the series of wall-paintings (painted in true fresco by the late W. Dyce, R.A.) in this room was commenced on the afternoon of Friday, October 26, 1894. The work first taken in hand was that entitled *Mercy*, which occupies the eastern compartment of the north wall, and is 11 feet 2½ inches in height by 10 feet 2¼ inches in breadth. It was painted in 1854. The late Mr. Cope, R.A., in the year 1868, cleaned this picture and repaired and repainted parts of it. The cleaning was effected by means of bread; the decayed parts were removed and some of the heads and hands were restored in water-glass. The entire surface was then coated with parchment size, any small injuries being touched up with size-colours. Finally, the painting was treated with a solution of paraffin wax in benzol. Mr. Horsley in 1873, and an officer of the Board in 1888, reported this and the other wall-paintings in this room to be in a comparatively good condition. But I found, in 1894, that not only was there much dirt on this picture, but that there were more or less conspicuous defects of three kinds in parts of the surface, namely, an opaque grey film, patches of a light brown hue, and actual exposures of the white ground. Sponging with distilled water removed much of the grey film, and lessened the disfigurement caused by the presence of the brown stains; the bare places were touched up with pigments mixed with egg-yolk, but these additions of colour were quite insignificant in extent, and did not affect any important part of the work. In order to lessen the unpleasant effect of the brownish patches on the light parts of the blue robe of one of the principal figures a little soft pastel chalk was applied to them. This is confessedly a temporary measure, for the colour can be instantly removed by a soft dry brush, but being in hopes of discovering some method of removing the brownish patches, I was unwilling to conceal them by any more permanent kind of repaint.

The large painting, *Hospitality*, on the north wall (11 feet 2½ inches by 22 feet) was next taken in hand. The surface was first washed with distilled water, by which much dirt and some of the grey film which obscured many parts of the work were removed. It was, however, found that the surface of this painting, especially towards its western end, was in several places in a soft and decayed condition, the pigments being loosely attached to the ground and the plaster rotten. These defects culminated in the light-coloured jerkin of a man's figure. Moreover, it was found that the grey obscuring film before mentioned could not be entirely removed, and remained conspicuously evident on the legs and feet of many of the figures.

The injuries which this fresco has suffered are the more remarkable since, in 1875, Mr. Horsley reported this and the other frescoes in the room to be in a comparatively good condition, such report being endorsed by the Board's officer in 1888. Mr. Cope had, indeed, in 1868, reported the fresco under discussion to be in a perfect state, but then it must be remembered that the artist had completed it only four years previously. However, Mr. Cope did cause it to be treated with a solution of paraffin in benzol in the year 1868.

I have now had the places in this large fresco where the colour had been lost touched up with tempera pigments, while the whole surface has been treated with a solution of which paraffin wax is the chief constituent. I felt that this treatment was the only one open to me, on account of its having been already adopted by Mr. Cope in 1868. I must, however, add the statement that the presence of paraffin in the superficial layer of this painting was scarcely perceptible, although I do not doubt that this hydrofuge substance has exerted a certain protective influence on the work.

The three remaining frescoes in this room (on the west wall) were treated exactly after the same manner as that just described. All three pictures were extremely dirty, and in each certain parts were in a decayed condition, some of the pigments having become blistered or detached. The defective places were repainted in tempera colours, and then the whole surface was treated with a weak solution of paraffin wax and copal in toluol. These frescoes were originally painted in the years

1851 and 1852. In 1868 they were cleaned and repaired by Mr. Cope, who cleaned them with bread, removed the decayed parts, repainted some portions with water-glass and the smaller injuries with size colours, covered them with parchment size, and gave them a final coat of paraffin in benzol. Having found that there were several portions of the lighter parts of the draperies in all the frescoes in this room which exhibited the light brown patches already noticed in this memorandum as occurring on the blue robe of one of the figures in the picture of *Mercy*, I finally decided to touch up these portions with tempera colours, so as to conceal these unsightly but irremovable stains.

The result, thanks to the skill and care of Messrs. Shrigley & Hunt's assistants, has been, in my opinion, entirely satisfactory.

It is scarcely necessary to say that no more paint has been used than was absolutely necessary.

The work in this room was completed on November 23. During its progress, however, the oil-paintings in the Prince's Chamber were washed and slightly oiled with drying linseed-oil, free from lead, so that the treatment of the five paintings in the Queen's Robing-room did not occupy the entire period between October 26 and November 23.

In concluding this series of memoranda I may be permitted to observe that I will gladly superintend any future and further treatment that may be required by the two paintings by Maclise in the Royal Gallery. I believe that these would be easily brought back to their original brilliancy and depth by the application of the paraffin solution, provided that no fresh grey film reappears upon them during the next few months. The treatment of three of the pictures in the House of Lords, and of five out of the sixteen paintings in the Peers and Commons' corridor is desirable. This work may well be deferred until the late summer of 1895. I should like to repeat once more, and very emphatically, my recommendation that every effort should be made to maintain a uniform temperature of not less than 60 deg. Fahrenheit in the Queen's Robing-room and the Royal Gallery.

THE "ROSY CROSS" EXHIBITION IN PARIS.

A CORRESPONDENT of the *Glasgow Herald* gives the following account of his experience with a society of eccentrics:—

The artistic Society known as the "Rose Croix" sprang into existence some years ago, and annually ever since its formation we have been favoured with an exhibition of artistic works of the ethereal, exalted class, which some people admire, or allow it to be thought they admire, but the real meaning or nature of which few can grasp.

The gentleman who goes by the name of the "Sar Peladan" is the high prophet of the Society. He has painted pictures of a very mystical description and he has written books intended to elevate human nature which are queer reading, and are beyond the comprehension of the average reader. The Sar Peladan has the head of a typical Christ—long beautiful hair of which he makes the most, the beard of a saint or "mage," the eyes of a man who is always in dreamland and among the poets. Formerly he used to dress in an eccentric manner, in harmony with his appearance. He wore black silk garments fitting loosely to a well-made person, long yellow leather boots and the headgear of an idealist. He used to be considered as a species of literary and artistic maniac, using language no one else used and presenting at his annual picture exhibition works which raised a smile when they were intended to elevate and purify the minds of the spectators. Gradually, however, the "Sar" has consented to descend in certain matters from the lofty regions of the ideal and to dress more like the common run of men. He has cast off the flowing silken garments and the long yellow boots and appears in public in a well-made suit of clothes with neat varnished boots.

For the varnishing-day at the Salon of the Rose Croix, I received an invitation to be present in the usual rather strange form, "The Order of the Rosy Cross, of the Temple, and the Grail. The Grand Master, Sar Peladan, invites you to the varnishing for the Fourth Salon of the Rosy Cross." The first exhibition of the kind, I recollect, was a much bigger affair than that of this year. In fact, each succeeding year the show of pictures has become more limited, and the place in which they are shown smaller. But, if the quantity is less, the quality is distinctly better. This year the Salon of the Rosy Cross is installed in the Rue de la Paix.

The room in which the idealists, who are fervent in their admiration for the "Sar" and members of his Society, exhibit their productions was crowded to overflowing on varnishing-day, and, as usual, the full-length portrait of the "Sar," in flowing robes and flowing locks, was to be met with everywhere. The best one is done by the Belgian artist, Delville. At the opening of the varnishing day some one had placed at the foot of the picture an incense-holder, from which

rose clouds of perfumed vapour and smoke. The "Grand Master" himself, with becoming modesty, had it removed.

Some of the paintings on view, although the work of originals, such as the members of this Society most undoubtedly are, have none the less, at any rate in a few cases, real merit. There are some very beautiful decorative figures from the brush of M. Charles Maurin, and a fine study of a woman dreaming at the edge of a pond, by M. Point, who also exhibits some very curious drawings. *A Night Reverie*, by M. Osbert, is suggestive and reposeful. *The Elements*, some subjects for stained-glass, by M. Adrien Duthoit, are good; and praise is due to M. Maurice Chabas for his work called a *Mythological Vision*. The *Flowers of France*, an allegorical vision by a painter whose name does not appear in the catalogue, is also a work of some merit.

It goes without saying, seeing the exalted and impossible theories which characterise the Sar Peladan and his faithful followers, that there are numbers of exhibits which are simply grotesque, both as to colouring and composition. Long lean women in long flowing garments, the figures being almost transparent, in the midst of most prodigiously long trees, violet, blue, saffron coloured, are to be met with, and one member of the Society has perpetrated a moonlight landscape of a very queer colour, which he calls *The Moon with a Cold in its Head*, or something to that effect. In the sculpture department there are one or two good things by Marquet de Vasselvt, and altogether, as I have remarked, though the show is smaller than it used to be, it is better, extravagance and eccentricity notwithstanding.

The "Sar," in a preface to his catalogue this year, intimates that if hitherto he leant towards excessive eccentricity and sensationalism, it was to attract and rivet the attention of the heedless multitude, which he now hopes to retain for his "cherished ideas and ennobling artistic reforms." In a word, he says, "he is about to abdicate in order to govern better," by which it is probable he means that he and his followers will patronise less wildly extravagant theories and consent to humanise themselves.

Amongst the people who filled the exhibition on the first afternoon were some very curious types. In fact most of the visitors present seemed to have a sort of relationship with the shadowy fading-away kind of pictures on the walls. Amongst the men, the majority of whom wore their hair long, was a personage draped in one of those cloaks known by the name of "Talma," and wearing round his neck a violet velvet cravat. He was evidently on the best terms with himself, but I doubt, out of carnival time, if he could have ventured to walk down the boulevards thus attired. There were also present several young girls with long braided hair, and three young persons of the fair sex who, standing together in a group, drew from an Englishman present the remark, "They are more mad-looking and delightful than any of the pictures." One of the three had her flaxen hair pulled down flat on either side of her face to the chin, and wore a curiously-wrought silver casque on her head. Her long thin arms and flat bust were encased in a silver-wrought jacket, which looked as if it might have been taken from a museum, and her faded velvet skirt, pale in hue, hung closely about her limbs. Her two friends were equally out of touch with the style of the present day.

TREASURE TROVE IN ROME.

ON the Pincian Hill, in Rome, writes a correspondent of the *Scotsman*, I lately witnessed a scene which would have delighted the soul of Professor Blackie and educationists of his school. It was a municipal teacher at the head of about a dozen little boys giving instruction *al fresco* from the busts of the mighty dead which adorn that loveliest of gardens. These busts, I may remark parenthetically, were put up at the instance of Mazzini during the short-lived Triumvirate of 1849, and have been added to from year to year, until the Pincian has become a Valhalla of all that Italy has produced of great or good from the earliest historic era to the present. The little group, consisting of the teacher and his pupils, drew up before the bust of Marius—a fine reproduction of that plebeian soldier whose vigorous, if unscrupulous, personality left its mark so deeply on the destinies of Rome, and one of the boys was asked to tell his class-fellows all he knew of the hero. This he did in good, set language, evidently the result of the previous night's preparation, and then another boy was invited to tell whatever more he knew in supplement to the narrative of his predecessor. From Marius the itinerant class then moved to Sulla, and thereafter to Pompey and Julius Caesar, the same process being gone through in each case, namely, the recital of a *viva voce* account of these great captains, in presence of their "animated busts." In this way an epoch-making chapter of Roman history was gone through in something less than an hour, without the aid of books, in the fresh morning air, and as the incident of an invigorating walk.

As I returned to my hotel, I could not help thinking how much the scene I had witnessed would have gratified the kindly educationist we have just lost, how fully it would have squared with his preference of *viva voce* to bookish instruction, with his love of artistic object-lessons in substitution for printed words, with his delight in open-air exercise taken conjointly with mental training. Of course, climatic conditions north of the Alps yield far fewer opportunities for this outdoor "palæstra" than the steadier, kindlier sky of Italy; but this drawback, as Professor Blackie would have promptly suggested, could be to some extent overcome by the "porticoed hall," open to the atmosphere but not to the rain, of which we are not without examples in the British Isles.

Apart, however, from its hygienic side, this learning of history in presence of its architecture or statuary is one which makes a well-employed visit to Rome or Athens of unique value in these days. Compare, for instance, the vivid impressions one receives from perusing Suetonius, or the Augustan history, or Herodian, in the palace of the Cæsars, the Forum, the Sacra Via and the Colosseum with what one derives from the same perusal in the arm-chair, particularly if the former be supplemented by immediate reference to the coins, the inscriptions and the busts of the long succession of the Cæsars. Such an advantage to the student of history explains the force of Dr. Johnson's dictum that no man's education is complete until he has visited the shores of the Mediterranean—a dictum which, if true in the doctor's day, is infinitely truer now when the excavator's mattock has brought to light a new world of Classical treasure as eloquent of the "long result" of antiquity as any palimpsest discovered in Egypt or parchment disinterred on Mount Athos.

Decade by decade Rome is adding to this exhumed world, and now there are three storehouses in which it is on view—the Museo Preistorico at the Collegio Romano, the Suburban Museum at the Villa Giulia, and latest and in some respects richest of the three, the Museo Nazionale Romano, inaugurated in the Baths of Diocletian. This "great open book" of history and art consists of the relics dug up from the subsoil of Rome or fished up from the bed of the Tiber, reinforced by the results of excavation carried on in the Roman provinces or even further afield. Three Ministers of Public Instruction, in whose competence the subject-matter lies, have successively laboured at the Museo Nazionale Romano, but Dr. Baccelli, the most scholarly of the trio, was the appropriate medium by whom it was made *publici juris*. Let us enter with the distinguished company, headed by their Majesties the King and Queen of Italy, and take a survey of the beautifully-arranged halls in which the "antiquities" appeal to us. The first accommodates the treasure trove yielded by that "Pompeii on the Tiber," Ostia, and the eye is at once arrested by the two grand portraits of the Gordians, placed laterally on the noble altar, decorated with reliefs describing the legend of Rome. Of priceless value is the next object, the bust of the Emperor Vespasian, conspicuous near the window; hardly inferior being the other imperial likenesses, arranged each in its proper recess, and all coming under the classifying letter B. The next groups of objects, those marked C and D in their appropriate *locale*, consist of the monumental remains of the Arval Brothers—a collection of unique value for the history of the Roman religion, and for the chronology of the "principato Romano"—and reinforced by memorable stones dug up on the Via Cecilia or Salaria, such as the "libello di Eutichete" and the honorary marble erected to Lucius Julianus—relics these which occupy an important position in the series of Roman epigraphs—to say nothing of the famous "Bronzo di Campoattaro," near Benevento, saved by Signor Bonghi for the Roman collection, and dealing with the "alimentation of the children of the poor instituted by the Emperor Trajan." Indicated by the letter E is a fourth group, composed of marble bas-reliefs for the most part proceeding from the excavations on the Palatine, while one of the recesses is set apart for all reliefs of purely Greek workmanship. The fifth group, marked F, is rich in sculpture, the gem of the whole being a marvellous young faun by Praxiteles, brought to light in the Via Venti Settembre, not far from the War Office. Very beautiful also is the head of a statue of Penelope found in the excavations close to the Tiber Embankment, and in appropriate proximity to it are a multitude of female heads representing the various modes of tying the hair employed by the "grandes dames" of ancient Rome.

The collection, however, which is of most novel interest is that made by Dr. Baccelli, consisting of the barbarous relics discovered in the tombs of Castel Trasino, near Ascoli Piceno. Twenty-nine in number were these tombs, and their contents were mostly ornamental armour belonging to warrior chiefs, much of it beautifully chased in gold—splendid ear-rings, bracelets, necklaces, evidently of female use, and such like. Descending to particulars, you notice a great variety of daggers, highly ornamented; perforated lances, the anticipation of the Mediæval halbert; leathern shields with gold or gilt bosses, and "corazze brigantine." Returning to the female ornaments—unique, I believe, of their kind—you are struck with the rings

(wedding and other), the necklaces of polychrome enamel and long ivory combs of exquisite workmanship. Then there are coins of the Emperor Justinian, forming not the least precious part of a medley of treasure trove—half Byzantine, half barbaric—the property, in all likelihood, of those Lombards who for some years occupied Castel Trasino and its vicinity. This collection, it is needless to say, evoked very marked as well as very general interest, and will doubtless form the subject of discussions, not to say controversies, or even literary encounters, only less obstinate than those of the warrior chiefs from whose relics they will spring. But whatever divergence of opinion they may cause, the antiquarian and historical world will be unanimous as to the great value of those treasures, enriching with further illustration epochs comparatively well known, and filling up, as the Byzantine barbaric collection does, a tract of history of which the monuments have hitherto been poor or scanty. Rome by this Museo Nazionale has added another to her attractions; and Dr. Baccelli has, by the same institution, still further strengthened his claims on the gratitude of the scholar, the artist and the man of letters.

THE ART OF WILLIAM HOLMAN HUNT.

A LECTURE was delivered by Mr. Whitworth Wallis, the keeper of the Birmingham Museum and Art Gallery, at the Royal Institution, Manchester, on "The Art of William Holman Hunt." Mr. Wallis said that the history of William Holman Hunt was the history of that movement which had borne the oft-discussed and the oft-misunderstood and misrepresented name of pre-Raphaelitism. The story of the pre-Raphaelite movement was the story of four great artists, generous-minded and enthusiastic men; it was the story, too, of the enthusiastic effort of youth, for so determined were these young painters in their work that there could be no such thing to them as failure. Though the famous brotherhood lasted but a short time, and the founders themselves were later separated in aim, yet the movement so inaugurated had had a permanent and remarkable influence upon all contemporary English painting. Most of his hearers were doubtless acquainted with the origin of the movement, usually attributed to the finding at Millais's house of a book of engravings of the frescoes in the Campo Santo at Pisa, the purity, simplicity and poetic serenity of which had a powerful effect upon the three friends and young artists—Rossetti, Millais and Hunt. As they seached through this book of engravings they found, or thought they found, that freedom from corruption, pride and disease for which they sought. There was no trace of decline, no conventionality, no arrogance. Whatever the imperfections, the whole spirit of the art was simple and sincere, and was, as Ruskin says, "eternally and unalterably true." It was in the autumn of 1848 that a definite attempt was made to band together a little company of students and friends who were prepared to follow openly the principles of fidelity to nature. A meeting was held at Rossetti's studio in Newman Street, and seven members enrolled themselves under the title of the pre-Raphaelite Brotherhood. They were Dante Gabriel Rossetti, John Everett Millais, William Holman Hunt, William Michael Rossetti, F. G. Stephens, Thomas Woolner and James Collinson. The one principle which was at first their ruling one was that of painting everything from nature and from one model, and that should a picture need a landscape background original studies should be made as far as possible under the conditions of light which the subject required; that is to say, moonlight was to be painted, not imagined, and to this close attention to the effects of light we are indebted for the superb results of moonlight in the *Light of the World*, the mountains of Moab in the *Scapegoat*, and the effects of light on the landscape in Millais's *Autumn Leaves*, and on the riverside foliage in *Ophelia*. Mr. Wallis then referred with great feeling to Ford Madox Brown, who though never a member of the brotherhood was the teacher of Rossetti and Hunt, and the painter of two of the finest pre-Raphaelite works in the world, the *Last of England* and *Work*. Holman Hunt was born in London in 1827. His father was in very modest circumstances, and, seeing that his boy would have to earn his own living, he entertained the strongest objections to his becoming an artist; Mr. Hunt, sen., holding that artists, actors, authors and other low-class individuals were a dissolute, reckless, loafing lot of idle fellows. At twelve years of age young Hunt was taken away from school, where, by the way, he had scribbled more designs in his copy-books than exercises, and was placed with an auctioneer as a sort of probationary clerk. This auctioneer was himself fond of drawing, and, oddly enough, encouraged the artistic qualities of his clerk instead of inculcating commercial principles: At the end of a year and a half the auctioneer retired from business, and Hunt then occupied a stool in a little room looking on to three blank walls in the office of a Manchester warehouseman. There, to his delight, he made friends with a designer of calicoes, and tried his hand at his first designs. At

sixteen years of age he relinquished commerce, and took up art as a profession. It must have been a hard fight. He tried for admission to the Academy schools and failed; tried again, and his drawings were rejected. Then his father spoke seriously to him, said he was wasting his time; but young Hunt said he would try once more, and did so, this time successfully. He was then seventeen. Then commences his friendship with Millais and Rossetti, the finding of the book of engravings and the starting of the pre-Raphaelite movement. Mr. Wallis then described at length each of Mr. Hunt's principal works as they had been produced, commencing with the *Rienzi*, incidentally remarking that Dante Gabriel Rossetti sat for Rienzi, and Mr. Stephens assured him it was the best portrait executed of the poet-painter at that time. In speaking of the *Christian Missionary* and the *Two Gentlemen of Verona* Mr. Wallis referred to the ignorant and vulgar abuse showered upon the pre-Raphaelites at that time; but he truly said that not a word was remembered now, whilst the pictures so abused were now famous and the artists amongst the greatest of the age, the lecturer adding interesting features or circumstances connected with the production of several of Hunt's best-known works. In conclusion, he said that of all the English pre-Raphaelite painters Mr. Hunt had remained the most consistent, the most exclusive in his aims and methods. No artist who had ever lived had been so painfully and so thoroughly conscientious as Mr. Hunt. Every picture had been painted with the utmost of the artist's strength and the keenest of his emotions. He was one of the greatest painters of the age, and his pictures ranked amongst the noblest, the greatest and the finest in the world.

PRE-HELLENIC WORSHIP.

A PAPER was read by Dr. Phené, on "Researches and Excavations in Argolis, Phocis, Boeotia, &c.," illustrative of the pre-Hellenic worship of Greece, before the British Archaeological Association, on Wednesday in last week.

The lecturer said he had undertaken the researches for the elucidation of a subject not touched on by the Greek writers, nor by any modern historian or mythographer, but yet one which, from the evidences he had found in India, Persia and Asia Minor, promised to reward diligent search. He had extended his examination over many years, and had made repeated journeys to the different parts of Greece which, from certain semi-historical traditions, seemed most likely to be productive of result. To obtain the information he sought, he selected districts which Greek history indicated to have been those first occupied by the different tribal clans, which, in an independent condition, settled in localities noted afterwards for their mysterious rites, their ancient families, and their consequently powerful influence on surrounding tribes, and eventually their historical importance on Greece, taken in a collective sense. So much of actual history was shrouded in the myths of poets, dramatists, and even of historians, that it had been a fertile field for modern writers to unravel some of the clouds of romance in order to find nuclei around which they had cumulated.

Greece and Italy were, of course, among the first countries he (Dr. Phené) had searched for the evidences he sought as long back as 1856, when, taking advantage of the favourable European feeling to England and to Englishmen, in consequence of the war with Russia, he found himself everywhere welcome, and received much assistance from Government engineers and officials. But he had not then studied his subject as he afterwards did. Indeed there were no literary channels for doing so, and his subsequent surveys were successful from the experience his own investigations secured him.

Led by one or two unexpected successes, and noting carefully the physical surroundings in each case, he followed up his researches in different countries with similar success. No longer accidental, but the result of careful notation of the local histories, the ancient sites of worship, the species of worship, with often their historical overthrow, contestation for and not unfrequently restoration of the old faiths. These events were screened under political records, which so far had not been the source from which mythologists drew their ideas. They sought the myths, and with all their changes myths they continued to be; whereas, denuded of externals and put face to face with facts and with those unchanging features of their special localities, the mountain sites of worship, the archaeological remains and the actual political events known to have occurred, difficulties were brought down to what appears plain matter of fact, though still of mysterious import and often of sad reality.

The pre-Hellenic worship of Greece had either been passed over as unknown by mythologists, or only penetrated superficially by such broad thinkers as Mr. Gladstone, but it had been illustrated in an extraordinary manner by the exhumations by Dr. Schliemann. At Mykenæ access was granted to Dr. Phené, and his object being to study the mythological

relics, it need hardly be said that his careful personal inspection was a great elucidator of many pre-Hellenic features of the local worship of the district; though he paid four visits to Argolis and visited all the historical places both before and after journeys to Cappadocia, and in Asia Minor generally, before he arrived at conclusions which show the close connection between the exhumed relics and the early worship of this, the most ancient part of Greece, at least so far as actual tangible history informs us.

With such data at his command, he showed by drawings the close resemblance of the most ancient and most sacred places of worship, the nature of the worship and its attendant sacrifices, the objects worshipped confirmed by history, the introduction of new religions, the contest between the priestly and warlike elements, tending to the overthrow of the old and the institution of the new faiths, with alternate successes, restorations, defeats and re-establishment on both sides in different localities. And how gradually one or other successful myth maintained itself by amalgamating some of the features or emblems of a deposed priesthood and worship with its own, thereby softening the hostility of the sacerdotal party and avoiding offence to the political. Notwithstanding which these varying worships, although local bitterness was softened, still tended to separate politically the different states of Greece, so leading to the internecine wars which prevented a general amalgamation in a national sense, except in such cases as a common attack as that of Persia.

Although the most ancient localities were selected, as Argolis, Phocis, Boeotia, with their grand seats of worship at Argos, Mykenæ, Epidaurus, Sicyon, Delphi, Parnassus, Thebes and also Corinth and Olympia, yet not only did the external features agree, showing very careful selection of places for sacred sites, but the worship and sacrifices also agreed, as well as the localised nomenclature and descriptive names of the objects worshipped, quite apart from what is understood as Grecian mythology, and finally the actual relics exhumed, or described as once existing in the several localities, strongly confirmed the whole. In some instances the introducers of the different worships were identified and the countries whence they issued, to an extent tending to show ethnological affinities with early races. Dr. Phéné, however, touched very slightly upon these, being desirous to confine his subject to Greece and to the parts of Greece, in particular, which he referred to, though he stated that his investigations extended greatly beyond Greece and were general through Europe and Asia, and had been prosecuted at great expenditure of labour, mental resource and study, as well as financial outlay.

One of the religions referred to was that of the Cabeiri, which existed from the earliest times, long prior indeed to Hephæstos or Vulcan, its supposed founder. The influence of this cult was immense. Not only was it closely connected with the other worships of the pre-Hellenic times, but it influenced men's minds by combining the highest artistic workmanship of the age, such as goldsmith's work, jewellery, gem cutting, intaglio engraving and high class lapidary work, in short, all that mental culture and physical design with a great knowledge of metallurgic art also involved in its age. It would necessarily carry with it the influence of kings, potentates and warriors, from the manufacture of diadems, regalia and arms; while female influence would be enlisted for it under the charms of personal adornment. To dislodge such a worship, surrounded as it was with all the rites of terrible mysteries, was a task that truly Herculean power alone could embark in. Many points not directly connected with worship arose in the inquiry, as, for instance, the introduction of the orange tree into Greece, which came in under a merciful female influence, which fostered labour, agriculture and the reign of peace.

A collection of exhumed articles was exhibited primarily, examples of every kind of plain, coloured and decorated pottery, of which illustrations had appeared in Dr. Schliemann's publications, both of "Ilios" and "Mykenæ"; next, pottery which was unlike any excavated by Dr. Schliemann in Argolis, assimilating to that of Troy, which he admits none of his Argolic pottery did, and which was dug up near the small pyramids between Argos and the road to Epidaurus, and the foundations of demolished specimens of similar pyramids. Bronze articles, including a bronze horse and a clasp for harness or for a sword belt, a bronze mirror, &c., while from one of the deepest tombs in the Agora of Mykenæ, which from Dr. Schliemann's excavations appears to have been a tomb of royal priests, fragments of the bronze sceptres, which had been left behind when the great treasure was secured, but which were collected by Dr. Phéné, testified to the intense age of the deposits. In this tomb Dr. Phéné also found a remarkable object which Dr. Schliemann had overlooked, a material of an intensely blue colour, with a polished surface, apparently an imitation lapis lazuli, which probably formed a casket in which the two crystal orbs found in the same tomb were deposited. From Troy he exhibited, also for comparison, not only the pottery above described, but specimens of the most delicately-coloured and enriched Sidonian glass, a bronze

lamp and iridescent beads from the tumuli, with fragments of semi-calcined bones and teeth, whorls, loom, weights, &c.

The president, Mr. Loftus Brock, expressed great interest in the beautiful Sidonian glass from Troy and some finely-coloured and polished cement, exhibiting the richness of internal mural decorations of the structures of Argolis.

Professor Rupert Jones, F.R.S., F.G.S., explained the bones and teeth as those of the goat and the pig, the one sacred to Pan and the other to Demeter, both therefore probably sacrificial.

Mr. C. H. Compton proposed a vote of thanks to Dr. Phéné which was warmly responded to.

SOCIETY OF ARCHITECTS' EXAMINATION.

A RESOLUTION was passed at the special general meeting of the Society of Architects on October 30, 1894, that applicants for admission into the Society after November 1, 1896, should, with only two exceptions—viz. (a) Candidates who are not less than thirty-five years of age, and have been directly engaged professionally in architectural pursuits as principals for at least seven years; (b) Candidates who are not less than thirty-five years of age, and have been directly engaged professionally in architectural pursuits as assistants or as assistants and principals for at least ten years—be required in every case to pass either, 1. An examination held by the Society; or 2. One or more public examinations held by other bodies, which may be taken in lieu or partly in lieu of the Society's examination.

It was also resolved that the Council should publish the first list of qualifying examinations, and submit the same to the Society before March 31, 1895.

In submitting a first list of the qualifying examinations the Council desires to point out that it has considered and weighed all courses of instruction and examinations connected with the architectural profession in the United Kingdom, and would lay special stress upon the importance it attaches to a systematic and well-graded course of instruction. As, however, the terms of the resolution of the special general meeting only take into account an examination as an alternative to the Society's own examination, it has been found impossible to recognise certain courses and schools where thorough instruction, unaccompanied by a final examination, is given. On the other hand; it will be found that the Council has been able to include certain examinations which, it is glad to say, have been preceded by a prolonged course of instruction.

The Council also desires to announce that, in response to its representations, certain public bodies now holding courses of instruction in subjects similar to those of the Society's examination, but at present unaccompanied by a final public examination, have expressed their willingness to take steps whereby such a final examination may be established, so as to meet the Society's approval and requirements. It is therefore hoped that before long the list of alternative examinations may be extended and that certain deserving public institutions, already providing sound instruction in architectural subjects, may be happily and properly recognised.

All candidates seeking election into the Society of Architects will, with the exceptions previously noted, be required to satisfy the Council that they possess a competent knowledge of architecture, building construction and materials, and modern practice. The subjects of the examination to be held by the Society are as follows:—

Section I.—ARCHITECTURE.

Subject (a). *Architectural History*.—The general principles of the various styles and periods of architecture, their dates, mouldings and enrichments.

Subject (b). *Planning and Design*.—The plan and design of some building or portion of a building, with details to a larger scale.

Section II.—BUILDING CONSTRUCTION AND MATERIALS.

Subject (a). *Construction*.—Constructional details in all trades.

Subject (b). *Materials*.—The properties, methods of working, manufacture and the application of materials to building works.

Section III.—PRACTICE.

Subject (a). *Specifications*.—Preparation of specifications and the examination of builders' accounts.

Subject (b). *Contracts*.—The conditions pertaining to a building contract; the relative positions of architect, client and contractor; and other questions of ordinary practice.

Subject (c). *Sanitary Science*.—To include water supply and drainage, ventilation, lighting and heating of buildings.

The Council further proposes to accept in lieu of the Society's own examination:—(1) A certificate of having passed the examination qualifying for the associateship of the Royal Institute of British Architects; (2) a certificate of having

attended the second and third year's course, including the architectural studio course and the passing of the final examination at King's College, London, in lieu of Sections I., II. and III. of the Society's own examination; (3) a certificate of having attended the three years' course of the Glasgow and West of Scotland Technical College in the subjects of architecture, architectural design and building construction, and of having satisfactorily passed the final examination of the same institution in those subjects, as in lieu of Sections I. and II. of the Society's examination; (4) in lieu of Section I. of the Society's examination a certificate of having gained a first class in South Kensington examination in the subjects of architecture and architectural design, and as in lieu of Section II. of the Society's examination, a certificate of having obtained honours in the South Kensington examination in building construction, including the practical examination.

All applicants will also be required, as heretofore, to fill up the authorised nomination form and to be recommended for admission to the Society on the strength of their professional and personal qualifications, by at least two members of the Society.

THE SIGNIFICANCE OF GOTHIC.

AT the last meeting of the Literary and Philosophical Society of Leicester, the Rev. P. T. Forsyth, M.A., lectured on "The Significance of Gothic Architecture." He said that it inevitably happened in the course of a lecture on the subject he had selected that he would have to deal with religious ideas. He desired it to be understood that he did not deal with those ideas with respect to either their truth or falsehood. He had nothing to do with that. On this occasion he put off for the time the profession to which he belonged and he simply approached the subject from a historical point of view, as indicating that in structures there were certain ideas conveyed, and whether they were right or wrong he would not attempt to discuss. Architecture held a place between the arts practical and ideal, between utility on the one hand and beauty on the other. Its first purpose was to be useful, to provide common places of shelter or enclosure. It was a means, not an end in itself, and it was only in its later stages that it became an art in the true sense of the word, an end in itself, and an expression of the soul's delight. The church building was first of all a rendezvous and meeting-house, and only after centuries did it become a cathedral. When architecture was treated in connection with religion it meant, of course, the temple, and they asked what was there distinctive and beautiful about the Christian temple, how far was it a piece of art, how soon did it become so, and how far did it express the distinctive aims and forms of the faith, and how far did it differ from the most perfect pagan temple? The Christian temple of course was the cathedral, and this was not the outcome of a generation, but the building of a century and the outcome of 900 or 1,000 years of cumulative force. In the first three centuries of Christendom there were practically no churches. The Christians met in private dwellings, in lodges and in philosophical schools, and worse still, in caves and catacombs. This was due to two causes—first, the simplicity of the early Christian faith, which made a church of whatever place the members frequented; and, secondly, the persecution to which they were subjected. But it was another matter when this strange creed, buried alive, so to speak, hitherto, was brought forth not only into the light of day, but into "the fierce light which beats about a throne." With startling suddenness the Christian religion took its place upon the throne, and it became identified in some measure with the Roman State. It at once began to spread and organise the forces of the world. It adopted the form of the Roman basilicas, or courts of justice, for its churches, and as it developed and progressed this was transformed into the cross-like formation which had formed the ground-plan of future ecclesiastical architecture. Thus it unconsciously became a significant reflection of the great central idea of Christianity. This cross-like ground-plan was not adopted because it was a Christian symbol, but was the growth of requirements. From the third to the tenth century there was no perceptible advancement in the outer style of architecture, for though internally there might have been an increase in barbaric splendour the structure was still of the basilica type. From 1000 to 1200 they got the Romanesque period, the chief characteristic of which was the rounded arch. The exterior of the building began to receive more attention, the tower began to rise from the centre of the cross ground plan, suggestive of aspiration, and unity was expressed in the arch. In the thirteenth century they got the pointed arch, and this was a symbol of a grand change, furnishing, as it were, the organ for a combined outburst of beauty and genius. The Classical disappeared before the Gothic. The rounded arch was heavy and lowering, weak in the middle, bearing to excess upon the side walls, and requiring them to be of heavy construction. With

it it was impossible to express properly Christian aspirations of the lightness and beauty of religion, but with the leaf-like pointed arch they were able to obtain lightness and elegance of design, and all that made the beauty of the Gothic temple lay in this change. The great strength of this arch did away with the necessity for massive side walls with small windows, as the whole support of the roof could now be relegated to the pillars. The style of our cathedrals conveyed the idea that they were organic, springing naturally from the earth with a tendency heavenward. Then they were a miniature of the world, combining styles diametrically opposed to each other in themselves into one harmonious whole, and they also conveyed the Christian ideas of unity and sacrifice. Sacrifice was expressed in their every part, every part being subservient to the whole, and this unity produced an effect symbolical of the calm of Christianity—the solemn calm of progress in outward life, and an unresting desire for improvement in spiritual affairs.

WOODSIDE BATHS, HALIFAX.

THE following statement about Woodside Baths has been prepared by Messrs. Horsfall & Williams, the architects:—

Our attention has been called to the fact that the outlay on Woodside Baths was once again brought to the front at the Markets Inquiry as a case in point of architects exceeding their estimates. We have, so far, permitted statements of this kind, made by persons unacquainted with the truth, to pass without comment, simply because we did not think such statements worthy of notice, having confidence that our professional reputation (pardon the egotism) in this district for not only reliable estimating, but for carrying out the works entrusted to us without extras of any kind, rests on a much broader basis than that of Woodside Baths. However, that no person may have any excuse in the future for circulating stultifying suggestions regarding ourselves in connection with the Woodside estimates (in ignorance of the truth), we now break silence and place the facts before the public, leaving them to be the judges as to the unjustness of our critics and detractors.

When it was decided to erect baths at Woodside, the Corporation naturally looked out for a site possessing convenience of locality, selecting the one upon which the baths are now built. The site was purchased before we came on to the scene at all, so that we were in no way responsible either for its fitness or its costliness.

The Corporation decided to have a competition open to the architects of the borough, but before doing so propounded a scheme of their own so far as settling the size of the swimming-bath, and the number of slipper-baths for each class and sex. From this it will be seen that these particulars settled the size of the building.

The Corporation decided also that this building was to cost 5,000*l.*, thus themselves settling definitely the quality and finish of the work. A large building for small outlay, of course, means inexpensive and less substantial work, for no man can give eighteenpence for a shilling. With these conditions before us, we prepared designs, and as premiums were offered, sent in two sets of designs, and these had the honour of both being selected for premiums.

The Corporation admired certain points in both designs, and we received instructions to prepare a modified plan embodying all the good features of both. Our estimate for the amended scheme for the same class of work was 5,990*l.* 19*s.* 3*d.*, and the actual cost of carrying out the same, exclusive of the additions made by the committee, and the unforeseen exigencies of the site, was 5,903*l.* 11*s.* 3*d.*, or 87*l.* 8*s.* less than our estimate.

We now had instructions to prepare builders' plans and specifications, and as is always our rule, employed men to dig trial holes on the site, that we might ascertain the nature of foundations. We now made the alarming discovery that the ground for a considerable depth consisted of loose filled material, and we were informed by men who knew that an extensive bed of clay had been removed many years ago. We felt it our duty at once to report the matter to the committee before proceeding further with the plans, the state of things indicating the necessity of foundations 12 and 14 feet below the turf, and also a strong sheeting of cement concrete over the whole of the site of the large bath chamber. After due deliberation, in consequence of the difficulty of obtaining suitable sites in the neighbourhood, and the fact that the Corporation had this one on their hands, it was decided to still proceed with the work. This unforeseen item caused an outlay to be involved of 749*l.* 3*s.* 6*d.* for extra foundations.

It was also finally decided to set back the building to permit of the future widening of Haley Hill, and as the levels of site fell rapidly from the road, to do this and still preserve the possibility of drainage into Haley Hill the level of the whole of building had to be still kept up to the same level, involving a

foot of extra height of walling throughout the whole structure and the same thickness of cement concrete over the whole of the bath chamber, at a cost of 166*l.* 5*s.* This brings the total cost of the scheme on the original lines up to 6,818*l.* 19*s.* 9*d.*

In going into specification details, the committee, seeing that the original amount fixed by them was insufficient for the most substantial and durable of fittings and furnishings, very wisely decided to spend a little more money in improvements and do the work in the best possible manner, being the cheapest in the end, and we beg leave to state that every penny of increase so involved was money well spent and for the public good. Under this category comes the "all steel roof," wood boarding instead of plaster, a special hard brand of hand-made bricks for lining the large bath-chamber, lining swimming-bath throughout with solid glazed bricks instead of tiles, all improvements being of this class. The total cost of all such matters being 1,020*l.* 2*s.* 6*d.*, and as our final certificates for all contracts passing through our hands was for 7,839*l.* 2*s.* 3*d.*, it will be seen that we carried out the work without a penny extra incurred by ourselves.

MANCHESTER CORPORATION SCHEMES.

AN inquiry has been held at the Manchester Town Hall by Colonel A. G. Durnford, R.E., an inspector of the Local Government Board, into applications of the City Council to borrow the following sums:—100,000*l.* for electric-lighting purposes, 100,000*l.* for works of sewerage and sewage disposal, 50,000*l.* for purposes of the Technical Instruction Act, 10,000*l.* for works of paving, 1,500*l.* for the provision of a pleasure-ground at Ancoats, 300*l.* for public baths, and 300*l.* for a public room.

Mr. Alderman Hoy, chairman of the Technical Institution committee, detailed the circumstances which led up to the erection of the Technical School. The Whitworth legatees, in handing over to the Corporation the Technical School and the Manchester School of Art, together with a certain sum in money, gave them also a plot of land in Whitworth Street on which to erect the Technical School. The committee asked for competitive plans for the new school. Mr. Alfred Waterhouse was called in to assist the committee to decide on the best plans. Under his advice the designs of Messrs. Spalding & Cross, of London, were selected. The next thing done by the committee was the giving of an instruction to Mr. Windsor, quantity surveyor, to make an independent statement of quantities. The committee had originally sought to borrow the sum of 150,000*l.*, which they had regarded as sufficient for the purpose of building and equipment. But the committee made many suggestions as to alterations of the plans and the substitution of materials. Mr. Windsor estimated that the cost of the school had by the adoption of these suggestions been increased by 29,377*l.* The estimate of Messrs. Spalding & Cross was that their plans might be carried out for 85,000*l.* The lowest tender, that of Messrs. R. Neill & Sons, of Manchester, was 133,950*l.*, with an alternative tender of 141,000*l.* Mr. Alderman Hoy described the work carried on at present in the schools handed over to the Corporation by the Whitworth legatees, and explained what were the resources of the Corporation.

THE SANDEMAN LIBRARY, PERTH.

THE new public library in Perth, which is to be erected from the designs of Messrs. Campbell, Douglas & Morrison, of Glasgow, will have public and private entrances in the new street facing the east. The reading-room is placed at the north end, with its side facing Mill Street, in which there are two large bow windows; the juvenile department is placed as an annexe, and adjoins the vestibule and hall. The lending library is at the south end. Its ceiling has been made 2 feet higher than that of the reading-room in order to make up for the sills of the window being necessarily kept high on account of the book-shelves. The ceiling heights of the principal rooms are as follow:—Reference library, 18 feet to the top of the cornice, average height in coved ceiling 21 feet 6 inches; museum, average height, 20 feet 6 inches; reading-room, 15 feet 6 inches; lending library, 17 feet 6 inches; librarian's house, 11 feet; basement, 7 feet 3 inches. The museum or hall is placed over the librarian's house at the south end of the building, and is lighted principally from the roof. It is intended to finish the side walls with a curved surface for the better exhibition of whatever is hung thereon. Although the museum is conveniently placed and groups well with the rest of the design, it can be omitted, the whole building being two storeys throughout. In every part and for every purpose the windows are so designed and placed that the maximum of light falls on all desks, tables and book-shelves wherever possible, and in a way that will prove efficient, as experience has shown. Externally the style of architecture is simple Italian Renaissance, permitting a large

number of windows. In the roof of the reference library and museum the principals are of wrought-iron, and the openings to the inner skylights are slightly sloped in the sides so as to give a wider distribution of light than parallel sides would admit of. The library staff need not be large, as it may be effectively worked in all its departments by a librarian and four assistants. The chief entrance is in the centre of the new street. Advantage has been taken of the large ventilator over the reference library to suggest a suitable place for a clock, which, it is thought, would be a convenience to the neighbourhood, and which, it has been ascertained, is perfectly compatible with a good system of extracting the vitiated air. The principal constructive materials proposed to be used are chiefly as follows:—One of the Dumfriesshire red stones, and externally all ashlar will be cross-hewn where not polished; the general finishings to be of the best quality of yellow pine, and the book-shelves to be of Kauri pine, or other hard wood, polished. As the roofs are not very steep, and the building is finished with cornice and parapet or balustrade, the roofs will not attract much notice till one is 30 or 40 yards away from the building, and it is therefore proposed to use good Ballachulish or old Easdale slates. For fireproof construction the system proposed to be used is that known as Fawcett's, with which the designers have been well pleased. It is proposed to tile the lower walls of the general reading-room and juvenile department. The heating suggested is by means of low-pressure hot-water pipes, combined with the admission of an ample supply of fresh air. The vitiated air will be extracted by means of ventilating shafts leading to patent exhaust ventilators on the roof. The cubic contents have been ascertained by measuring from the bottom of the foundations to one-half the height of roof, the total quantity being 334,600 cubic feet (exclusive of museum). The rate per cubic foot has been arrived at from the actual cost of buildings recently erected and of a somewhat similar character to the present building, inclusive of lighting, heating, ventilation, interior fittings and plain painting. Cubic contents—334,600 cubic feet at 6½*d.*, 9,410*l.*; add fees 6½ per cent., 588*l.*—9,998*l.* To complete the design, including the museum, the extra cost would be as follows:—49,200 cubic feet at 6½*d.*, 1,383*l.*; fees at 6½ per cent., 87*l.*—1,470*l.*

GENERAL.

Mr. C. J. Ferguson, architect, of Carlisle, is about to start for Athens to make an investigation into the damage done to the Parthenon by the recent earthquake.

A Design by Mr. C. B. Fowler, of Cardiff, has been adopted for the public fountain which is to be erected by Mr. Thomas, M.P., in Pontypridd.

The Jasper Vase ordered by the late Emperor of Russia for presentation to the city of Paris is now complete. It is cut out of a block from the Caucasus.

Dr. Marjolin, who died in Paris on the 7th inst., has left a sum of 4,000*l.* to the French Académie des Beaux-Arts, the interest on which will be given every second year to the French artist who has produced the best engraving in "taille-douce."

A Hippodrome with an area of 12,300 mètres is about to be constructed on the Boulevard Malesherbes, Paris, from the designs of M. Yvon.

The Officers elected at the annual meeting of the Northern Architectural Society on the 20th inst. are as follows:—President, Mr. J. Oswald; vice-president, Mr. F. W. Rich; honorary secretary, Mr. A. B. Plummer; honorary treasurer, Mr. J. T. Cackett; honorary librarian, Mr. H. C. Charlewood; council, Messrs. C. F. Armstrong, F. E. Caws, W. Glover, W. S. Hicks, J. H. Morton (ex-officio), and J. W. Taylor; Mr. R. B. Dick and Mr. C. S. Errington.

A Paper on "Forestry" will be read at the ordinary general meeting of the Surveyors' Institution on Monday next, by Mr. G. Cadell.

A Large Stained-Glass Memorial Window has been publicly unveiled in St. John's Church, Bethnal Green. It is erected to the memory of the late Mr. Keymer, of Whitefriars Street, E.C., superintendent of Sunday schools, the subject chosen being *Our Lord Blessing Children*. The window was erected by Messrs. Alex. Gibbs & Co., 10 Bloomsbury Street London, W.C.

Messrs. Amos & Foad have been declared the contractors for the New Ashford board schools, of which Mr. H. J. Jeffrey is architect.

Mr. Edward Hargitt, one of the members of the Royal Institute of Painters in Water-Colours, died recently. His pictures of English rural scenery were marked by their quiet simplicity. Mr. Hargitt was also an enthusiastic and competent ornithologist. He lived long enough to complete his great monograph on the woodpeckers for the British Museum, a labour of love on which he had been engaged during the past twelve years.

The Architect.

THE WEEK.

THERE are so many pictures in the South Kensington Museum by modern English artists that works by the old masters appear to be out of place in the galleries. On the other hand, water-colour drawings are not appreciated as they merit when seen in the National Gallery. It is, therefore, satisfactory to learn that a sort of temporary exchange of works between the two institutions has been arranged. The National Gallery will lend a collection of water-colour drawings by DE WINT and CATTERMOLLE, and some sketches by TURNER. From South Kensington pictures will be sent to Trafalgar Square, including a large fresco by PIETRO PERUGINO and a head of St. PETER MARTYR, by GIOVANNI BELLINI.

IF light railways can help English agriculturists and country traders to overcome some of the difficulties which are now oppressive, as many facilities as possible should be given for their construction. But the precedents observed with ordinary railways should be set aside. A system which enriches lawyers and Parliamentary agents at the expense of shareholders is a scandal. A paper was read by Mr. McLAREN before the Farmers' Club on Monday in which he explained the procedure which should be followed, as well as that which should be avoided. His propositions were as follows:—(1) That in many parts of the country light railways would be a great advantage. (2) That the present hindrances, mainly due to the stringent requirements of the Board of Trade, should be relaxed, so as to admit of the construction and working of light railways without the expenditure of unnecessary capital. (3) That new powers should be given to the Board of Trade to authorise the construction of light lines, either alongside of public roads or otherwise, granting compulsory powers to take land, and in case of dispute to appoint an arbitrator or valuer to finally and promptly decide between the parties. (4) That the procedure should be simplified so that the expense of obtaining the necessary powers should not, except in extraordinary cases, exceed 25% per mile. (5) That all light railways should be of the standard 4 feet 8½ inches gauge. (6) That wherever it can be arranged they should be worked by the railway company with whose line they communicate. (7) That the decision of the District Councils shall be *prima facie* evidence as to whether the lines are required or not. (8) That the District Councils shall have power to guarantee a dividend of not more than 3 per cent. per annum on the capital invested in the construction of the line. Mr. McLAREN's proposals have much to recommend them. What is required is an imitation of American practice. An English railway is made as if it were to endure for eternity. But changes are inevitable. Lines have to be widened, bridges altered, platforms lengthened. The excellence of the work increases the expense of alterations, and the shareholders have to pay for things that are profitless. If a similar rule were imposed on American engineers a great part of the country would still be in its primeval condition. They are moderate in their expenditure until adequate profits come in, while in England it is imagined that the costliest work can be met by the traffic, and in consequence a perennial source of loss is often created.

AT one time in Ireland the word valuer was as comprehensive as 'civil engineer or architect,' and it was employed by gentlemen who were not distinguished by their knowledge of the subjects it represents. The existence of a Government department that regularly determined the value of the smallest holdings facilitated the creation of would-be experts. Many a time large sums have been paid for valuations which were ascertained by merely adding a nearly uniform percentage to the amounts entered in the valuation lists that were prepared for the purposes of taxation. In consequence larger sums have been given for estates than they were worth, and unhappy relations between landlords and tenants sometimes owe their origin to that cause. The anecdote related by Mr. CARSON, Q.C., in the debate on the Land Law Bill on Tuesday, reveals

how unscientific and baseless is the process which still passes for valuation in Ireland. It is so amusing, and at the same time so characteristic of Irish business as to be worth reprinting:—"They told the right hon. gentleman," said Mr. CARSON, "that the question of fair rent was a question of valuation; it might differ according to the men who made the valuation. Once they put an end to the free contract as between landlord and tenant they were always driven back to those absurdities, that the rent to be a fair rent would be held by one valuer to be 10% and by another 30%, according to the predilections of each individual. While valuers differed sometimes, it was alleged occasionally that in making an independent valuation they had arrived at the same conclusion as regarded fair rent. He recalled one case in this connection. Two valuers were called up, one after the other, to value a farm. One of the valuers valued the farm at 59% 19s. 11½d. Another gentleman who was called up said that he had valued the farm exactly at the same figure. On further examination this gentleman said that he had not communicated in any way with the previous valuer, and that he had made his valuation from field to field, and without having seen the result brought out by the previous witness. In cross-examination the witness told the Court that he had great experience in valuation work, and that he had taken charge of many difficult cases. Then the witness was asked this question by counsel, 'May I ask whether you happened to see on any part of the farm "a coincidence?"' Turning over the leaves of his note-book, he replied, 'Yes, I think in one of the fields, near a far corner, there was one, but I do not know that I paid particular attention to it.'" It is no wonder the House of Commons laughed at the story. Can anyone expect that agrarian disputes will come to an end when land is valued in such a haphazard fashion? If some Irish Secretary could persuade a few of the English surveyors to accept office in Ireland in order to establish a proper system of valuing land an immense benefit would be conferred on the country.

THE paper read by Mr. W. R. WATSON at the meeting of the Glasgow Architectural Association on Tuesday was upon Sir CHRISTOPHER WREN. He gave an historical and descriptive account of England in the middle of the seventeenth century, and explained the state of general science and the architectural practice of the period. The chief events of WREN's interesting and eventful career were then alluded to, notably the visit to Paris, and it was shown under what advantageous circumstances that visit was made. Referring to the circumstance that WREN, unknown even as an architectural amateur, was selected to assist the Surveyor-General, the lecturer remarked that he was at that time, more than any other man in the kingdom, equal to anything of national importance that might be required. His love for architecture was only a part of his sympathy for everything that could appeal to a man of genius; had there been no mathematician of eminence besides himself, nor any remarkable poet, painter or sculptor, WREN would have been all or any of these, as the necessity of the time might have required. The second part of the paper was devoted to a description of a few of the great architect's better known works, and was illustrated by diagrams, photographs, &c.

THE London School Board evidently consider that their organisation is perfection, and, if an error should arise, it must be through some defect outside the offices on the Embankment. Recently tenders were solicited for a school for 800 children at Tooting. Messrs. GREGAR & SON, who were one of the selected firms, in sending in their tender stated that three of the bills of quantities were not supplied to them, viz. the preliminary bill and the bills for extra depth of foundations and for building the brickwork in cement, and that no provision for these bills was made in the amount of their tender, which amounted to 18,756%. The works committee appear to have treated the lapse as a fault of the contractors, and another tender was accepted. The question, however, must be asked, why should Messrs. GREGAR & SON be set aside through some failure on the part either of the School Board officials or of the Post Office?

MODERN GERMAN ARCHITECTURE.*

ALL the world has read (for THACKERAY was the historian) about the famous fight between the booby WILLIAM DOBBIN, the "gee-ho" of Dr. SWISHTAIL'S Academy, and Master CUFF, who was the head boy and dandy. They know how all the youths were amazed when the Cock of the School succumbed after thirteen rounds. DOBBIN'S unexpected victory transformed him. He gained self-confidence, and although his Latin poetry was never brilliant, he was so successful in mathematics that a copy of "Telemachus" was presented to him at the end of the term. Afterwards he turned out to be a brave and modest soldier. The Germans have had a like fortune. They were supposed by the rest of Europe to be the most impracticable of mortals, fit only to reside in that cloudland which HEINE assigned to them in his partition of the universe. DOBBIN would probably have remained a booby all his life if he had not spoiled the countenance of the king of the school. The estranged races of Germany would likewise have endeavoured to content themselves in the fog-lands of metaphysics and other unrealities if they had not found that they could use swords as well as make verses about them. Members of the Peace Society were shocked when, a few days ago, the Emperor, in presenting a sabre to his ex-Chancellor, spoke like an ancient warrior. They should remember that what Germany gained by fighting was infinitely more valuable than the winning back of some land and water and milliards of francs. Self-respect was achieved and a conviction of the possession of power, and they are worth any price. No longer content with abstractions, the Germans since their wars have become the rivals of Englishmen and Americans in utilising the materials which nature affords, and the science which formerly held a position not unlike that of poetry has become the inspirer of the manufacturer.

As a consequence there is a vast change in German books. They no longer go back to the origin of things in the search for a metaphysical basis of a subject. War has taught the authors that we are here to grapple with realities, or what pass for such, and they are accordingly sought out with a sort of fervour. The address of Professor BROCKHAUS is an example. Who could have believed thirty years ago that in the University of Leipzig, a city that seems to have books instead of piles for its foundations, the subject of architecture would be treated without any reference to the theories of the art which have there originated, and that the word "ästhetisch" would be rarely used in the discourse? But who could have imagined thirty years ago that the market-place would be one day dominated by a colossal group of the five directors of the overthrow of France? They also triumphed over the old systems which were constructed in Leipzig, for as long as students gaze on the figures of the Emperor, his son and nephew, BISMARCK and MOLTKE, they must be convinced that abstractions are not fitted for conquest in this world. Another sort of spirit is also manifest in the address. Every German must now feel that the world lies open to him. Professor BROCKHAUS accordingly looks on the architecture of the past as a treasury which can be used. In England and elsewhere that sort of belief is not unknown, but the past is utilised in an almost shame-faced manner, as if a sort of petty larceny was being committed in imitating ancient forms. A third peculiarity also deserves to be mentioned. Professor BROCKHAUS is not afraid to refer to buildings designed by his countrymen who are still living, and to praise them with heartiness.

In the beginning of his lecture the Professor refers to the national spirit which made Gothic the favourite style for Lutheran as well as for Catholic churches. The so-called Jesuit style found no favour with German congregations, but in modern buildings for the Lutherans Mediæval plans have not been faithfully adopted. The Lutheran ritual has of late dictated the plan. Of course, Professor BROCKHAUS was not satirical when he takes up the subjects of theatres immediately after churches. He speaks with admiration of the new theatre in Leipzig, which is an effective building. But like so many who restrict architecture to exteriors, he does not say a word about the

interior arrangements, which are successful in enabling an audience to hear and see with comfort. Few German theatres are more satisfactory for a playgoer. The new concert-hall in Leipzig is also a remarkable building and in some ways unique. The Professor is not afraid to render justice to the Parliament House in Berlin, which has not received the approval of the Emperor, and he couples with it the new Law Courts in Leipzig. In describing those buildings, he recognises the influence of SCHINKEL in the Gothic as in the Renaissance manner. There is also a tribute of praise given to the Law Courts in Brussels, a group of buildings from which continental architects have drawn much inspiration.

The Professor then considers the materials for construction. Stone is not easily obtainable in all parts of Germany, but its use for erecting sumptuous buildings is recognised, and it is thus employed in Munich, Dresden and Berlin. For official buildings it is appropriate, but its use in Germany is a testimony of costliness. Brick has stronger rights to be recognised as the national material. SCHINKEL used it in the Werder'sche Church, near the palace in Berlin, as well as in the Academy of Building. In Hanover it has been a favourite material with architects, but in the majority of German cities brick buildings form an important element. In a warrior nation iron must command respect. Professor BROCKHAUS could hardly express more admiration for it if he were addressing a class of engineering students. He points out that without it modern necessities could not be satisfied. He compares old and new railway stations, old and new markets, in order to show what is gained by its adoption. Then there are exhibition buildings, like the Crystal Palace in Munich, which exist because iron beams and columns could be utilised for the construction. In the last-named building about 2,000 works can be exhibited every year, which attract 100,000 visitors. In a city like Munich, which is not over wealthy, it is an advantage for artists to have a building where their works can be well seen and visited without inconvenience. That is not the only use of iron which the Professor recognises. Purists and theorists will object when they find that he admires its employment as a sort of skeleton which can be clothed with materials of other sorts. The dome of the Law Courts in Leipzig and the roof of the Hall of Assembly in the Berlin Parliament House are examples of its subserviency to architectural necessities. It is worth noting that the Professor admits the indebtedness of builders to the exhibition building of 1851 in Hyde Park as a demonstration of what could be done with iron as the principal building material.

In considering the personal influence of the architect the Professor goes back to the last century. In noticing the career of J. B. FISCHER a few weeks ago, we explained his admiration for the Baroque style of Italy. As all German rulers aped LOUIS XIV., a sort of combination of that style with French became popular in most parts of Germany. It was unfashionable to imitate old German work, but a class of men arose corresponding with the poets who declined to follow French models in literature, and they believed that the earth presented before men's eyes no more beautiful buildings than the Mediæval temples in Strasburg and Cologne. GOETHE, however, while admiring Gothic was captivated by Italian architecture. He found a great many imitators even among architects. The tendency of German taste oscillated between north and south. The discoveries of Scandinavian literature naturally compelled men to feel that they were allied to the Vikings, and that their style of building should be Gothic. On the other hand, the love of the classics made them admire Greek and Italian work. SCHINKEL and SEMPER represented the latter, HEIDELOFF the former. Men who might be supposed to be impartial, who were critics rather than builders, were found on both sides, and when JACOB BURCKHARDT taxed the Mediævalists with ingratitude for forgetting their debt to the Italians, he was met with assertions as strong about the opposite view of duty. The varieties of opinion are exemplified in Munich more than in any other German city with which we are acquainted; all styles are congregated in the streets. But Berlin also is not without exotic examples, which become more striking from their contrast with the military precision of the majority of the buildings.

* Unsere heutige Baukunst Antrittsvorlesung: gehalten am 9. Februar, von Dr. Heinrich Brockhaus. Leipzig: F. A. Brockhaus.

The facilities for travel and the ease with which photographs of buildings can be taken provide a stock of information for students such as would be deemed impossible in an earlier age. How is it to be used? In spite of the hold which Mediæval buildings have had on the German mind, Professor BROCKHAUS perceives that the fascination of the South is still more strong. Classic and Renaissance has the advantage of allowing the employment of sculpture of the highest class, while with Gothic figures must be distorted. The caryatides seen on one of the façades of the new Leipzig theatre are a sort of decoration which cannot be easily surpassed. Similar figures have been employed in other German buildings and they always meet with admiration. In a country where there are many able sculptors who are competent to produce fine figures at a moderate price, the style of building that seems to be most eligible is one in which sculpture can be largely utilised. But Professor BROCKHAUS does not rely on that sort of adornment alone. He realises that science can produce coloured materials, that terra-cotta can be cheaply purchased, and in many ways structural forms can be enhanced by decoration. In other words, he accepts the world as it is, and he sees no reason for a man in the nineteenth century to long after existence in an earlier period of art. The German architect, he perceives, has manifold resources, and it will be his own fault if he does not employ them for the benefit of his contemporaries.

POMPEII.*

THE ruins of Pompeii, ever since their discovery by Don ROCCO ALCUBIERRE in 1748, have enlisted a great amount of interest from their importance in revealing to the nineteenth the conditions of the life of the inhabitants of a Roman city in the first century. Nothing, perhaps, could be more conducive to the continuance of that interest than the gradual and slow uncovering of these ruins that has been in progress during the last fourteen years, for fresh objects are brought to light, and so successive stimuli are given to the public who desire to know more.

Enough had been done when MAZOIS published his researches in "Les Ruines de Pompeii" to excite the wonder and admiration of his contemporaries, and when Sir WILLIAM GELL's beautiful work "Pompeiana" and DONALDSON'S "Pompeii" appeared, between 1824 and 1830, the marvels at the foot of Vesuvius were made better known to the British public, and the circle of students of the Pompeian ruins was greatly widened. DYER'S work of 1867 again enlarged this circle, while LYTTON'S "Last Days of Pompeii" attracted to the buried city the attention of a still larger class, and photography has made the general features of Pompeii familiar to all.

Since Signor FIORELLI was appointed director of the excavations many valuable additions have been made to our knowledge. Some of these were published and illustrated in ROLFE and FISCHETTI'S elegant volume of 1884, and FIORELLI'S "Giornale degli Scavi di Pompeii" has from time to time made known other discoveries.

The latest contribution to our knowledge of Pompeii is Mr. FITZGERALD MARRIOTT'S work, "Facts about Pompeii," which not only describes recent discoveries, but gives much valuable information respecting previously uncovered ruins not dwelt upon by other writers, by which a much more vivid picture of the Pompeii of old is given to the mind than was before obtainable by English readers.

The evidence of the storeyed character and of the height of the original houses of the city furnished by the ruins of the houses on the southern cliff, and by pictures which have been preserved, quite remove the impression given by the general absence of a second storey to the houses at the present time. One of the cliff houses shows three floors built against the side of the cliff. The lowest shows a terrace that roofs over the bathrooms; behind are large rooms, and also two small rooms one above the other, thus occupying the same height as the larger rooms; above are the walls of the floor on a level with the general ground-floor

level of the city. The houses behind the Curia Isiaca show two storeys distinctly by their height and the marks for the beams.

Contrary to the general impression, too, of low rooms, it is shown that the height of the rooms opening on the atrium of the Casa dei Diadumeni must have been about 15 or 16 feet. A very interesting picture in the Casa del Centenario represents a country or farmhouse, with two if not three storeys, and a perfect fresco has been preserved in a small house near the Casa del Balcone, showing a house with two floors and a room on the roof.

The towers on the walls have hitherto received very scant notice, but they are here described and illustrated.

To Professor MAU we are indebted for the discovery of the four styles of mural decoration corresponding to the four periods of the history of the city. These are (1) the Oscan or pre-Roman, (2) the Republican, (3) the early Imperial to A.D. 50, and (4) the period from A.D. 50 to the destruction of the city in A.D. 79. A valuable portion of Mr. MARRIOTT'S work is devoted to this subject, in which the author gives the examples of each style and period which have been preserved.

The chapter entitled "Notes on Some of the Most lately Excavated Houses" is full of interest, since, besides the cliff houses, it includes notices of the Casa del Centenario and that of the Monte d'Argento.

The five years' labour which the author has given to Pompeii has enabled him to make an important addition to our knowledge of details, by a very complete representation of the curious masons' marks on the stones of the uncovered houses and other buildings. Over 300 of these ancient inscribed marks are accurately reproduced, with precise indications of where they may be found. The author is certainly to be congratulated upon having produced not only a highly interesting and beautifully-printed and illustrated volume, but a most valuable contribution to that complete elucidation of the remains of the ancient Campanian city which all historians, antiquaries and architects so much desire.

PRICED QUANTITIES.

IN October of last year a sub-committee of the Manchester Society of Architects was appointed to consider the question of depositing priced quantities with architects by builders. Queries relating to the subject were addressed to the architectural societies. On receipt of their answers an application was made to the Building Trades Association, asking "whether, in the event of the Society undertaking to recommend their members to subdivide the contracts into the different trades, the members of the Association would be prepared to deposit their priced quantities with the architects?" After considering the subject the following resolution was adopted by the Building Trades Association:—"That in reply to the letter of the Society of Architects the question be asked whether the architects will agree to the quantities being taken and the accounts squared up at the completion of the building by an independent surveyor, and that the quantities form part of the contract." The reply of the Society was as follows:—"That this committee is not prepared (in its report to the general meeting of the members of the Manchester Society of Architects and other independent architects) to recommend any interference with the individual practice of architects in respect to taking out of quantities. It is, however, prepared to advise making the quantities a part of the contract." The Council of the Building Trades Association thereupon stated that they had nothing to add to their resolution. It would appear, however, that earlier in the year a similar inquiry was submitted to the Master Builders' Association, for on May 4, 1894, that body passed the subjoined resolution:—

"That the priced quantities shall not be given to the architects unless they are made part of the contract, but that, if so requested, they shall be produced at the final squaring up of the building, for the purpose of settling the accounts."

It appears the phrase "unless they are made part of the contract" did not form part of the resolution, the correct phraseology being "that the priced quantities shall not be given to the architects, but that, if so requested, they shall be produced at the final squaring up of the buildings, for the purpose of settling the accounts."

On the 19th ult. a special meeting of the Manchester Society of Architects was held, when it was unanimously resolved:—

That this special general meeting of the Manchester Society of Architects (and other architects), having read th

* *Facts about Pompeii: its Masons' Marks, Town Walls, Houses and Portraits. With a Complete List of all the Masons' Marks cut in the Stones.* By H. P. Fitzgerald Marriott. Illustrated. London: Hazell, Watson & Viney.

report of the sub-committee appointed to consider the question of "builders depositing priced quantities with architects," is of opinion that (in view of the position taken up by contractors in Manchester) it is the duty of this Society to recommend its members, in the interest alike of their clients and the public in general, to follow a certain practice, viz. :—

(a) That the quantities shall form part of the contract.
(b) That the quantities shall be priced and monied out to the amount of the contract sum produced at the signing of the contract, sealed up, and in the names jointly of the architect and the builder, deposited with a banker, or some third person who may be agreed upon, with instructions that the parcel is to be produced only on the joint application of the parties.

(c) The architect to have the right to check the carrying out of the items in the deposited copy when it comes into his hands at the squaring up of the contract, and also to rectify prices on either side which are palpably incorrect (clerical errors), such rectification not in any way to interfere with the contract sum, but to apply solely to additions and deductions or extra works.

(d) All variations from the contract, both additions and deductions, and all extra works to the extent of 10 per cent. above the contract sum, are to be priced out at the rates named in the deposited quantities.

(e) All further additions above the 10 per cent. extra named in paragraph (d) are to be considered as additional works, and the prices to be subject to revision or confirmation, to be agreed upon, if practicable, at the time the works are ordered.

(f) All clear deductions from the contract, when there are no corresponding additions, or additions to an equal value in similar materials, to be priced out at 5 per cent. below the rates named in the deposited quantities.

(g) In all cases the period at which additional work has been executed should be considered when the prices are affixed at the time of the squaring up of the accounts.

The practice in the country may be judged from the official replies sent from Dundee, Glasgow, Leicester, Birmingham, Leeds and Yorkshire, the Northern Architectural Association, and Nottingham to the questions proposed by the Manchester Society :—

1. *How are contracts let, i.e. to one contractor, or divisible into separate trades?*

DUNDEE.—Each trade separately, viz. 1. Mason, excavator and bricklayer; 2. carpenter and joiner; 3. plumber; 4. plasterer; 5. slater.

GLASGOW.—Trades as a rule contract separately. The single contract is the exception.

LEICESTER.—In both ways.

BIRMINGHAM.—One contractor.

LEEDS AND YORKSHIRE.—Both ways

NORTHERN ARCHITECTURAL ASSOCIATION.—Both systems are in use here.

NOTTINGHAM.—To one contractor.

2. *If the former, is one contractor responsible for cleaning up during progress of work and at end of contract, and for making good damage to work?*

DUNDEE.—Usually a clause is inserted in schedule making mason responsible for clearing away all rubbish and waste, and he is paid for this.

GLASGOW.—Each contractor clears away his own rubbish.

LEICESTER.—At the end of each trade in the quantities a clause is inserted to the following effect, viz. make good after all other workmen, and leave all perfect at completion.

BIRMINGHAM.—Yes.

LEEDS AND YORKSHIRE.—Yes, but he sees that his sub-contractors do it.

NORTHERN ARCHITECTURAL ASSOCIATION.—The specification should define in each case.

NOTTINGHAM.—Yes.

3. *If the latter, who is responsible for damage to other works?*

DUNDEE.—Each tradesman is responsible for whatever damage he may do either to his own or to other tradesmen's work. If the party liable cannot be ascertained, then the tradesman whose work is damaged must repair.

GLASGOW.—Each is responsible for damage done to his own work.

LEICESTER.—The general contractor is responsible. In the case of separate trades contracts, this matter often leads to disputes, the architect generally settling who is to make good the damaged work.

BIRMINGHAM.—Contractor.

LEEDS AND YORKSHIRE.—Each contractor is responsible for all damage to his work.

NORTHERN ARCHITECTURAL ASSOCIATION.—The specification should define in each case.

NOTTINGHAM.—Yes.

4. *Are the separate trades responsible up to the completion of building, and after all his men are removed?*

DUNDEE.—Yes, except in case of fire. The proprietor insures against fire as soon as carpenter has done part of his work.

GLASGOW.—Each is responsible until the work is taken off his hand by the architect.

LEICESTER.—Yes, but we usually make the contractor-in-chief responsible.

BIRMINGHAM.—No.

LEEDS AND YORKSHIRE.—Yes.

NORTHERN ARCHITECTURAL ASSOCIATION.—The specification should define in each case.

NOTTINGHAM.—Main contractor.

5. *Does the contract sum remain as a fixture, or is the work remeasured at the completion?*

DUNDEE.—The contract sum remains a fixture. The work is not remeasured as a whole, but if necessary remeasurement is resorted to only with regard to items which either party can show reasonable cause for believing to be of greater or less extent than set forth in the schedule.

GLASGOW.—When the contract is a lump sum extra work only is measured and priced at the contract rates. In ordinary cases the whole work is remeasured.

LEICESTER.—If contractor can show that items in the quantities have been exceeded in the carrying out of the work, the addition is made at the schedule of prices. If architects find there are deductions, they in like manner make deductions at the schedule of prices.

BIRMINGHAM.—Contract sum remains a fixture.

LEEDS AND YORKSHIRE.—The contract remains a fixture; extra work and deductions only are measured at completion.

NORTHERN ARCHITECTURAL ASSOCIATION.—Deviations from contract only are measured up.

NOTTINGHAM.—Remain as a fixture, and measured if necessary.

6. *As to quantities and measurements, are quantities prepared by architects or by independent building surveyors?*

DUNDEE.—The practice in Dundee has always been for architects to prepare their own schedules of measurement, except when any individual architect may have been too busy, in which case he might employ an ordained measurer.

GLASGOW.—By independent surveyors.

LEICESTER.—By architects.

BIRMINGHAM.—Sometimes one, sometimes the other.

LEEDS AND YORKSHIRE.—Both.

NORTHERN ARCHITECTURAL ASSOCIATION.—Both systems are in use, but chiefly by architects and surveyor appointed by them.

NOTTINGHAM.—Quantities prepared by architects generally.

7. *Are quantities priced up and deposited with architects under seal or not, or are they produced by the builder only when required?*

DUNDEE.—After receiving the offers the architect calls in the schedule of the man whom he wishes to accept, and if he finds the schedule correct he accepts the offer, having previously given this contractor a blank schedule, so that he can keep a copy of his own prices.

GLASGOW.—They are priced up, and remain with the architect. As a rule the surveyor gets a copy.

LEICESTER.—The quantities are fully priced in and left with the architects, and after being verified they are sealed up if required by the builders and opened only for the purpose of making up certificates and adjusting the final account. As a matter of fact, they are generally left in the hands of the architects without being sealed up.

BIRMINGHAM.—Yes, not under seal.

LEEDS AND YORKSHIRE.—Deposited when the contract is signed, often not sealed.

NORTHERN ARCHITECTURAL ASSOCIATION.—Priced quantities (not under seal) are usually deposited with architect for his own use and in confidence.

NOTTINGHAM.—Priced quantities are deposited with the architects.

8. *How are extras and deductions dealt with at end?*

DUNDEE.—As a rule, extras and deductions are only allowed on the written order of the architect.

GLASGOW.—They are priced at contract rates, and the amount is added to or deducted from the original contract.

LEICESTER.—Measured up and priced according to the schedule where that applies; in other cases a day account is kept.

BIRMINGHAM.—Measured up.

LEEDS AND YORKSHIRE.—Are measured and allowed on schedule of prices in original contract.

NORTHERN ARCHITECTURAL ASSOCIATION.—Deviations from contract only are measured up.

NOTTINGHAM.—Adjusted by the architect on a fair basis.

9. *Are they priced at the same amounts in the original quantities, or are they agreed upon between the builder and architect?*

DUNDEE.—At the same rate per foot or per yard as in the original schedule if the work is the same as anything in the schedule; then by agreement.

GLASGOW.—At the contract rates for a similar work, but for a new description of work at rates agreed upon by architect and contractor before the extras are commenced.

LEICESTER.—Priced according to the original quantities where they apply.

BIRMINGHAM.—Same prices as in schedule, unless a special arrangement is made before the signing of the contract.

LEEDS AND YORKSHIRE.—Are measured and allowed on schedule of prices in original contract.

NORTHERN ARCHITECTURAL ASSOCIATION.—According to priced quantities, unless they do not apply.

NOTTINGHAM.—Priced bill of quantities forms basis.

10. *Are sub-contractors asked to give prices or information in reference to extras and deductions?*

DUNDEE.—No sub-contracts.

GLASGOW.—No.

LEICESTER.—If additional work is required, architects here negotiate with the contractor for the work.

BIRMINGHAM.—Rarely prices. Often information.

LEEDS AND YORKSHIRE.—If the contract is let in one, priced quantities are obtained from all sub-contractors; they are dealt with at finish as above.

NORTHERN ARCHITECTURAL ASSOCIATION.—If necessary, but through chief contractors as a rule.

NOTTINGHAM.—Sub-contractors' names are sent in with priced quantities, and extras and deductions settled with the sub-contractor.

11. *Or are these matters dealt with by the chief contractor solely?*

DUNDEE.—Solely between the contractor for each department and the architect.

GLASGOW.—By the chief contractor only.

LEICESTER.—They are dealt with by the contractor for the work. If separate trades tender, the architect would negotiate with each. If a general contractor is accepted, then all negotiations are made through him.

BIRMINGHAM.—Usually by the chief contractor.

LEEDS AND YORKSHIRE.—The questions are carried on through the chief contractor.

NORTHERN ARCHITECTURAL ASSOCIATION.—Yes, qualified as per reply No. 10.

NOTTINGHAM.—No; by sub-contractors.

NEWBATTLE ABBEY.

FROM time to time during the tenure of the mansion-house of Newbattle, Midlothian, by the present Marquis of Lothian, interesting discoveries have been made, says the *Scotsman*, concerning the remains of the old abbey, on part of the site of which the mansion-house stands. Newbattle Abbey (or Newbottle) was founded in the year 1140 by King David I., the "sair sanct for the Crown," for the monks of the Cistercian order. Of the architecture of the monastery of Newbattle nothing more is known from the records or chronicles than the meagre and half-authentic particulars collected by Father Hay. There is proof enough, indeed, of the extent of the abbey buildings. They could accommodate eighty monks and seventy guests with their retainers; and to entertain, as the abbey often did, the bishop and the whole synod of his diocese, to receive the sovereign and his court—for there is scarcely a king, from its founder downwards, who was not at Newbattle—must have required a large and spacious edifice. The abbey buildings were burnt by Richard II. of England in 1385, and again by the Earl of Hertford in 1544, during the disastrous expedition despatched by Henry VIII. to punish the Scots for their refusal to betroth the infant Queen Mary to his son. On that occasion the bonfires of what were known as the "bloody betrothal" were a line of blazing abbeys from Holyrood to Dunbar.

An old record says:—"Upon the 15th day of May the horsemen raid to Newbottill and brynt it, and oversaw Dalkeith be the moyane of George Dowglas, and brynt many other tounes theirabout. Na skaith was done to any kirks, except and thae destroyit the Abbey of Newbottill, and the same nicht they returnit to Leith." The burning of such a pile of masonry was perhaps but a partial destruction. In any case, it is related that a few years after the rough handling it received from the English, the abbey buildings were sufficiently restored to be thought a convenient place for the reception of a convention of the lords of the party, which the Queen Dowager in person held there preparatory to declaring war against England in 1557. The subsequent disappearance of the ancient abbey buildings cannot be accounted for in the usual way by alleging the violence of a Reformation mob. The Abbot of Newbattle of that day, Mark Kerr, whose portrait hangs in the mansion-house, embraced so heartily the principles of the Reformation that his dwelling would probably have been respected by the most zealous reformers; and as Newbattle has been a mansion for his descendants continuously since, we may rather seek the cause in a preference for modern comfort in a newer building, to the picturesque architecture and the pious and historical associations of the old abbey.

At the time of the Reformation Mark Kerr, as has been said, was Abbot of Newbattle. He was the second son of Sir

Alexander Kerr, of Cessford. Renouncing Popery, he expelled the monks and retained the lands as "Commendator of Newbattle," which title with all its privileges was confirmed to him by the Scottish Parliament in 1581. Scott of Scotstarvit states that Mark Kerr and his eldest son of the same name, who in 1606 was created first Earl of Lothian, "did so metamorphose the building that it cannot be known that ever it did belong to the Church by reason of the fair new fabrick and stately edifices built thereon, except only that the old name and walls of the precincts stand;" and more recent members of the house of Lothian have further extended and modernised the structure.

The grand old church, with its burial-ground, was effectually obliterated. Father Hay asserts, almost as an eyewitness, that "in the midst of the church was a tomb of the queen of King Alexander II., of marble, supported on six lions of marble. A human figure was placed reclining on the tomb, surrounded with an iron grating;" and it must be in the ground somewhere near the back entrance to the modern mansion that this queen (Mary de Couci) rests, as also Sir Alexander Ramsay, Sir James of Douglas, and many lords and ladies of the house of Lothian.

The present mansion-house occupies a portion of the area of the ancient monastery, and though ingeniously hidden by modern improvements the ancient masonry is still visible at parts of the walls, while here and there an antique moulding peeps out from its later setting. The picturesqueness and variety of line of the mansion-house show that it has gradually and in only a half-premeditated way grown to its present dimensions. The details of the architecture bear an Early English character, and have been assigned by a high authority—Professor Willis, of Cambridge—to the middle of the thirteenth century. This seems to show that the superstructure at least of the old abbey survived the successive burnings by the invading armies.

The remains of the old abbey, which the concealing earth had covered, were brought to light in quite an accidental way. The first discovery was made in 1878. While digging the foundations for an addition to the mansion-house, the workmen came upon the foundations of the old church. The Marquis, greatly interested in the work, caused extensive excavations to be made on the north side of the mansion-house, with the result that the nave, aisles and south transept were found. These were sufficiently marked on the grassy sward, the position and size of the nave and chancel pillars being indicated by cuttings, filled in with gravel, upon the grass. Again, in November 1892, some workmen employed near the mansion-house, digging pits in which to plant trees, struck upon a piece of solid masonry. In making further borings the mason-work was found to extend for some distance, and the Marquis then gave his clerk of works, Mr. Ramsay, instructions to have the matter thoroughly investigated. Systematic excavations were begun, with the result that the foundations of the north transept and of certain side chapels of the abbey were laid bare. The north transept had two angle buttresses of large dimensions, similar to those of the Cistercian abbey at Furness, in Lancashire; but in the case of that edifice the buttresses were at the angles of the chancel in the east end. The north transept has now been picked out on the grass, in the same way as the other parts of the abbey chapel. The visitor will note the great thickness of the east wall, and the great size of the chancel pillars.

Extensive excavations were again continued in 1893 and 1894, and have just been finished, both in the interior of the mansion-house and round about it. In the former case the excavations were connected with the complete restoration of the crypt. Those who know Newbattle will remember that from the entrance hall a grand wooden staircase leads to the spacious vestibule on the first floor, where are hung so many of the valuable art treasures of the mansion. But on each side of the grand staircase there are flights of stairs leading into the stone-vaulted and stone-ribbed crypts. Part of these had been dealt with in a former excavation; now the crypts have all been opened up, and extending across the mansion-house from north to south, form a beautiful addition to this interesting pile. The crypts both on the south and north sides of the portion immediately behind the grand staircase had been built up, and certain portions of them used as servants' rooms and lumber stores. The whole, as has been said, have been cleared out from end to end. Arches, where necessary, were thrown over the openings, and in the course of the work the bases of the old pillars were revealed in line with those now remaining in the crypt, which had a connection with the south transept of the church. After being hidden for centuries, these bases are still in perfect preservation with the masons' marks upon them. At this the north end, in what is called the Armour Crypt, an old chimney was discovered, which measured about 8 feet at the under side. At another place was discovered the old kitchen chimney, the under side of which measured 12 feet 6 inches by 6 feet. Both flues had the smoke of the old fires still upon them. The crypt pillars are octagonal. The plain shaft measures

3 feet 6½ inches in length, and each side of the pillar 7 inches. From the top of the capital, or spring of the arch, to the floor is six feet. From the pillar to the foot of the corbel, going from east to west, measures 13 feet 1 inch; from pillar to pillar, going from north to south, 9 feet 7 inches. The arches are circular. The ribs show five plain sides, each measuring 5 inches. The keystones—now all plain—may possibly have been at one time enriched with bosses, as some fine specimens of bosses were found while excavating the crypt. One of these old bosses is preserved and placed inside the crypt. From the keystone of the rib to the floor measures 12 feet. The inside length of the crypt now open from north to south is 100 feet by 27 feet 7 inches wide. The crypt, it is conjectured, had extended from the south transept southward towards the river for about 200 feet, inside measurement. The bases of the pillars of the great hall and chapter-house were discovered towards the east of the crypt. The size of the base of the great hall pillars is 5 feet 9 inches by 5 feet. The chapter-house pillar bases were 3 feet 7½ inches by 3 feet 5½ inches, finely moulded in the Early English style. The great hall pillar bases may be seen; the chapter-house pillars are marked in one of the small courtyards of the mansion. The whole of the crypts save one have been laid with polished oak, and, being appropriately furnished, they form quite an addition to the show portion of the mansion-house. The exception made is a small crypt on the west side, which apparently was the old abbey kitchen, for it was here that the great chimney was found, and at one side of it is also an ancient oven. The flooring of this has been treated in quite a novel way. During the excavations at Newbattle Abbey a large number of old and curiously-shaped flooring-tiles were found. They were hand-cut, from 1¼ to ½ inch thick, with a fine glaze or enamel of various colours, such as yellow, green, red, black and brown of different shades. These of course, along with other curiosities found, have been carefully preserved. The Marquis instructed his clerk of works to have the floor of the kitchen crypt, as it may be called, covered with an inlaid wooden floor, the pieces of wood of which were to be of the size and shape of the old tiles found. No pattern was to be used unless there was an old tile design to correspond to it. The designs were geometrical in character, but some of the tiles had inlayings in the shape of fleur-de-lys, conventional roses, &c. The work of reconstructing a design for the flooring conformable to the old patterns was a task of great difficulty, but it was successfully accomplished, and the greater part of the inlaid flooring has been laid with effective results. The flooring has been made and laid by the estate workmen, on whose taste it reflects great credit. All the wood used was grown in the park, and a fine effect has been secured by using various coloured veneers, such as yew, oak, maple, laburnum, plane tree. The great fireplace has been boarded over, carved screens set at each side, and with a step up from the floor, where the great hearth of the fire had been, the little crypt, which is well lighted by modern windows on the front of the mansion-house, has assumed quite an ecclesiastical aspect.

Passing outside again, it may be noted that at the west end of the abbey church towards the south were found the foundations of the west wing, with a portion of the old stair leading from the dormitory to the church. The width of this wing inside the walls is 28 feet 6 inches. About the centre of this wing, 80 feet from the north wall of the abbey church, the main entrance to the cloisters was found. Outside the doorway were three steps, 5 feet 6 inches by 10½ by 6 inches deep, and the size of door between the jambs was 4 feet 9 inches, and the width of passage through to the cloister garth was 6 feet 2 inches. The walls were of ashlar-work. The outside wall of this wing is 3 feet thick, and of that next the cloisters 2 feet 6 inches thick. One of the chambers south from this entrance to the cloisters was 68 feet long by 23 feet 9 inches wide; it seems to have been groined, and would possibly be a continuation of the dormitory. The bases of four pillars were found in this chamber, and as all were of different design the shafts would also be different. The one next the south was like a quatrefoil; the second to the south was circular, with zigzag moulding round the base; the third from the south was octagonal; and the one at the north end was a circle, with dog-tooth moulding round the under shaft. About 40 feet from the end of this chamber a wall was found extending east and west, having on each side a stone-built arched culvert of ashlar-work, 2 feet 6 inches wide by 2 feet 6 inches high. It was about 4 feet from the present surface, and had evidently been the old underground waterway for cleansing purposes of the abbey. The foundations of the refectory walls were found extending east from this chamber, but north and south as they usually are placed. They contained a fine moulded doorway near the south-west corner of the cloister quadrangle. The moulded jambs had a bay of 3 feet from the door outwards. The jamb moulding was Early English Gothic. Unfortunately these excavations were right in front of the main doorway of the mansion-house, and after careful examination had all to be covered again with soil. The door just men-

tioned was found right in the middle of the carriageway, but of it a full-sized drawing was made by the clerk of works. The south boundary wall was found extending east and west by the bank of the South Esk, near to which the abbey stands, while the boundary wall from the west wing already referred to extended southward and joined the other by the river bank. They were 3 feet in thickness. As the excavations proceeded Mr. Ramsay, clerk of works, made most careful measurements of the walls and foundations, and from these he has prepared a ground plan of this grand old abbey, which, if not quite complete, is approximately so, and gives one a true appreciation of the dimensions of this ancient pile. The length of the great hall and the size of the chapter-house cannot be ascertained, as the east end of both are covered by the present mansion. As already stated, the walls and pillars and transepts of the church have been carefully marked on the lawn over the buildings. A brown glazed fire-clay edging, unobtrusive in colour, has been used. The great door on the west front has also been outlined with this edging.

The excavations were made to a depth of from 3 feet to 4 feet 6 inches from the surface of the present ground, and the principal details of the old abbey as laid down on the ground-plan are:—

Church.—Extreme length east and west outside walls, 253 feet 3 inches.

Extreme length east and west inside walls, 239 feet 3 inches.

Extreme width north and south outside walls, 66 feet 7 inches.

Extreme width north and south inside walls, 57 feet 1 inch.

Extreme length of nave, 161 feet 6 inches.

Extreme width of nave, 31 feet.

Extreme width of aisles, 13 feet ½ inch.

Extreme length of crossing, 41 feet 9 inches.

Extreme length of chancel, 36 feet.

Extreme width north and south between transepts, 117 feet.

North and south transepts, east and west (inside), 45 feet 6 inches.

North transept, north to south, 32 feet 3 inches.

South transept, north to south, 28 feet 2 inches.

North wall in north transept is 8 feet thick.

Other walls in church and transept, 4 feet thick.

South wall of church, next cloisters, 3 feet 6 inches thick.

West front wall of church, 6 feet 6 inches and 8 feet thick.

Buttresses on the north aisle, 4 feet by 5 feet out from wall.

Angle buttresses at north transept, 16 feet 4 inches by 10 feet 4 inches.

Corner buttresses at east end of church, 12 feet by 3 feet out from wall.

Buttresses north and south side of chancel, 8 feet by 3 feet out from wall.

Buttresses east of chancel, 6 feet by 3 feet out from wall.

Octagon.—Base of four pillars under the great tower, 10 feet by 10 feet.

Base of two pillars in chancel, 10 feet by 10 feet.

Base of pillar in north transept, 7 feet 10 inches by 8 feet 3 inches.

Refectory, length inside 106 feet.

Refectory, width 33 feet 6 inches.

Cloister quadrangle, 125 feet 10 inches by 123 feet 10 inches.

Width of chapter-house, 28 feet.

Width of great hall, 43 feet.

Width of sacristy, 18 feet.

From the north wall of the abbey church to the south boundary wall of the river is 378 feet 4 inches, and from the south boundary wall to the wall at the culverts is 186 feet 6 inches.

The foundations of the outside wall of the old burial-ground, which was on the east and north of the church, were also found—not straight, but with a gentle curve from north to east by south. They were 3 feet thick. While digging in this portion of the ground a number of stone coffins were found, principally outside the chancel and north transept. These were mostly of loose slate. One coffin of polished ashlar was discovered near the south transept entrance from the cloisters. One or two of the coffins were opened and were found to contain the bones of well-built men. All the coffins disturbed were carefully replaced, and like the other excavations this part has also the grass growing upon it again. In the cloister quadrangle was found an old stone-built well, 3 feet in diameter and 14 feet deep. Below that it was full of rubbish. Several interesting relics of the last burning of the abbey were found in the shape of pieces of the charred beams and of the old bell of St. Marie de Newbattle, which had been molten by the fierce heat. One of these pieces weighs about 16 lbs., and there were many other fragments. A small silver coin of the reign of James IV. of Scotland, whose young bride, Margaret Tudor, was entertained at Newbattle on her journey to Edinburgh, was also found.

It is not generally known that the Marquis of Lothian, with great consideration, allows the mansion-house and abbey to be opened to visitors every Wednesday and Saturday when the

family are not in residence there. The pictures are most valuable and interesting, and archaeologists and architects will find much in the recent excavations and improvements at the abbey to which to devote attention.

THE STUDY OF ART.

AN address was delivered by Mr. George Clausen, A.R.A., at the distribution of prizes to the students of the Stoke School of Art. He said he had always felt an indebtedness to those artists who had helped him in his student days with their advice and encouragement, and he regarded it as a privilege to address for the first time in public a gathering of students. The fact that artists were always willing to help one another was a real proof of their brotherhood. Whatever branch of art they practised, it was their duty to make good to the best of their ability their claim to the great brotherhood of art, a brotherhood that was, perhaps, the biggest in the world, the most inclusive, and the most exclusive, for they could claim a real and living relationship with the great minds of the past. It was good for them as artists that those men were living and speaking in their work to-day. The universal language of art knew neither time nor space, and spoke to them from remote periods of antiquity. It should be a pride to them that the art of the potter had left the world a richer legacy of beauty and interest than any other branch of art. Their simply turned productions in clay, while being the most fragile substances, were also the most imperishable, and through the long course of history down to the present day they found that the extent of a nation's civilisation and progress in the arts might be measured by the evidence accorded by the pottery of various periods. So that they in that district might be described as the lineal successors to a very great inheritance of beauty, and therefore they had a direct interest in and a reason for the study of art. Art was an individual matter. Everything that they as students of art did must have first come to them from without, either from nature or the works of great masters. The whole object of their work should be first to train the eye and hand, and, secondly, to acquire a standard of taste. They must not try to cultivate style. Their own style would come, for they could not eliminate their own personality from their work. They must endeavour to find out what it was the masters saw, but they should not take a theory for granted until they had satisfied themselves of its truth, and in following the ideals of their choice they should try to follow the example and not the individual. They should not only endeavour to become good draughtsmen, but they should let their general study be as wide as possible. They should strive to study everything for the beauty which was in it, and if it be that they were unable to originate work they would be none the poorer for enlarging their conception of beauty in art and nature. Doré declared that art was a hidden thing and that it was for artists to drag her forth. The question, however, would come to each of them, how were they to employ their skill? And the answer would depend upon the measure of their ability. They must remember that all their studies in the past were not in themselves an end but the means to the attainment of the end, which was that they might impress their work with their own individuality. In the potter's art there were many who had obtained distinction for the individual character of their work, amongst them he might mention M. Solon. It was difficult to say how far it was possible under the present conditions of work to prevent the effacement of the artist's individuality, but for a man there was always a way where there was a will. Although there were many more openings for young students of art than there used to be, he considered the area of what was held to be artistic needed to be widened. He was not one of those who took the view that painting and sculpture were the only fine arts. All forms of art were fine arts. But the painter and the sculptor had an advantage over all other art workers in that he was able to assert his individuality and obtain personal recognition more readily. What he wanted to urge was that all art was united and could not be separated. It would be a good thing if manufacturers would as far as possible help young men to develop their ideas.

TESSERÆ.

The Walls of Babylon.

THE walls of Babylon have been a fertile source of exaggeration, but allowing for this they must have been extraordinary works, and to the dwellers in the open plain they formed the only means of defence. According to Diodorus Siculus, there was sufficient space within the outer walls of Babylon not only for the gardens and orchards, but to cultivate corn enough for the subsistence of the whole population in case of siege. The citadel was the holy place, where the palace-temple stood, where the treasures were kept, and where were preserved

the records of the kingdom carved in stone; it was also the place of refuge in time of danger. This sacred ground was elevated above the other buildings, both to give dignity to the palace-temple and strength to the citadel. In those plains where no natural eminence was at hand a regular platform of crude brick was constructed 30 or 40 feet in height; the custom of building on elevated ground still exists, and many of the ancient mounds are occupied by a modern citadel. It was to defend this sacred enclosure that those huge walls were built, so often celebrated by ancient authors. Herodotus speaks of the walls of Babylon as 300 feet in height and about 75 feet in thickness, and according to Diodorus, the walls of Nineveh were 100 feet in height, and so broad that three chariots might be driven abreast upon them: 1,500 towers were built at intervals along the walls, each 200 feet in height. Whether these dimensions be correct or not, it is certain that the fortification must have been of prodigious strength, as, in the reign of Sardanapalus, Nineveh was only subdued by the combined forces of the Persians and Babylonians after a siege of nearly three years. At certain distances in the wall were the gates, either flanked by towers or ornamented at the entrance by gigantic figures, such as the winged bull. The exterior of the wall was frequently cased with square slabs, most probably of native alabaster, and was decorated with paintings. Ezekiel speaks of these paintings, "For when she saw men portrayed upon the walls, the images of the Chaldeans portrayed with vermilion, girded with girdles upon their loins, exceeding in dyed attire upon their heads." Diodorus says that on the outside of the principal palace of Babylon built by Queen Semiramis figures of men and animals were painted, and that the paint was laid on the bricks before they were placed in the furnace. Some enamelled bricks have been found at Nimroud on which the colours appear to have been thickly laid in a liquid state and afterwards baked in.

The Campo Santo, Pisa.

Extraordinary interest attaches to the Campo Santo at Pisa, as one of the nurseries of painting before it could well stand erect, justifying a brief recurrence to the treasures it contains. On the walls of that extraordinary cemetery are embodied, in pictorial form, many of the most interesting subjects which can affect mortality. The *Last Judgment*, by Orcagna, which served Michel Angelo as a model for certain portions of the great work which has rendered him immortal, exhibits the most wonderful energy in giving tangible form to the Dantesque conception of the subject. Throughout Italy remains of the mosaic style are to be traced in the fresco paintings, and nowhere are they more manifest than on the walls of the Campo Santo at Pisa. The adoption in fresco of simple geometrical figures, which did not interfere with the curved lines of the composition, and which gave a "mosso," or movement to the groups (just as architecture introduced in a picture gives life and vitality to the delicately-modelled surfaces), was in every respect most valuable. The gold of the mosaics which was at first retained by the fresco painters began to disappear, its use being principally confined to the delineation of the nimbus or circle that surrounds the heads of the saints, executed in a sort of raised and stamped plaster, and to different ornaments about their persons, as a gold key in the hand of St. Peter, &c.

The Primaries in Decoration.

It is well known that if blue and red come together without the interposition of white, they would each become tinged with the complimentary colour of the other; thus, the red would become slightly orange, and the blue slightly green. As all coloured bodies reflect some white rays, the white in juxtaposition, by its superior force, extinguishes these white rays, and we see the colours purer, at the same time that the white becomes tinged with the complimentary colour of that against which it is placed. As one of the objects of decorating a building is to increase the effect of light and shade, the best means of using blue, red and yellow is to place blue, which retires, on the concave surfaces; yellow, which advances, on the convex; and red, the colour of the middle distance, on the horizontal planes; the neutral white on the vertical planes.

Flesh Painting in Windows.

We sometimes hear it disputed whether the flesh ought to be coloured or left white in a glass painting, the opponents of tinted flesh urging the impossibility of imitating nature exactly in this respect. The answer is obvious enough. The whole colouring of a glass painting is highly conventional, whether it be of the draperies, of the flesh, of the sky or of any other object; still, so long as it does not exceed the limits of conventionality—a point to be ascertained only by observation and general opinion—the eye and imagination are satisfied. We should be startled and disgusted at seeing flesh painted green or blue, but the complacency with which pink or white flesh in a glass painting is regarded by the generality of mankind is a sufficient proof that neither of those tints contradicts nature too violently, and therefore that the artist does not exceed the limits of conventionality in using either white or tinted flesh at his discretion.

NOTES AND COMMENTS.

WHEN it was proposed to paint the walls of the Houses of Parliament, the German fresco-painters became the monitors, and their account of their own practice was supposed to be the best guide for the English artists. Nobody at the time had any misgiving about the endurance of the recently painted German works. The foreign recipes were adopted, and the result is the deplorable spectacle on which Professor CHURCH has been reporting. For a long time the frescoes in Munich, which inspired the English experiment, have been decaying, and it is impossible to make out the subjects which some of them represent. The Prince Regent, who is courageous, has resolved to attempt the renewal of half a dozen of the historical frescoes in the arcades of the Hofgarten, and gave commissions to three painters. Full liberty is granted in dealing with the old work, and if the remains have to be removed and entirely new pictures substituted, there will be no discontent, at least among the courtiers. The frescoes representing landscape scenes, which at one time gave rise to much interest on account of their novelty, will remain as they are until more is known about the effect of the operations on the figure-pieces. If the experiment is successful, we suppose the frescoes on the exterior of buildings like the Art Galleries, the Post Office, &c., will also be renewed. In Italy the old frescoes excite a sort of pity, for it is felt they have succumbed to time, but in Munich, as in Westminster, the decay is only evidence of incompetence.

AT the first annual dinner of the Dundee Institute of Architecture, Mr. LESLIE OWER, the vice-president, offered a suggestion which is worthy of attention in Scotland. He said the time was ripening fast for a Scottish Institute of Architecture, and that was a step which they ought to bring about. With the Universities of Edinburgh, Glasgow, Aberdeen, St. Andrews and their own College, he saw no reason why a Scottish Institute should not have a system of examination as fully equipped as the Royal Institute of London. Comparatively few Scottish architects were connected with the latter body, which had never quite gained the sympathies of the profession in Scotland or in England. Such an Institute as he desiderated would raise the status of the members of the profession, and elevate the standard of art amongst its members. In Scotland they have a logical way of considering things, and it must often be asked by others as well as by Mr. OWER, What is the advantage of going southwards to undergo an examination which was got up solely to suit English weaklings, or to seek membership in a Society that is unknown in the north? The influence exercised by the Dundee Institute is proof of what can be done by architects who are not hampered by rules that are inappropriate in Scotland.

MR. WATERHOUSE, R.A., has awarded the prizes in the competition for the new hotel to be erected by the Belfast and County Down Railway Company at Newcastle. Mr. JAMES J. FARRELL, of Dublin, has carried off the first prize of 100*l.*, which of course was satisfactory to the directors, as they could not be charged with calling in strangers. Messrs. GIBSON & RUSSELL, of Gray's Inn, London, were awarded the second prize of 75*l.*, and the third prize of 50*l.* fell to Mr. F. H. TULLOCH and Mr. LIONEL LITTLEWOOD, of Westminster.

THE freemen of the Company of Playing Card Makers honoured themselves when they conferred the honorary freedom of the company on Sir A. W. FRANKS, the keeper of British and Mediæval Antiquities in the British Museum. He has rendered invaluable services in endeavouring to trace the history of cards, but it would be difficult to find any class of ancient work which Sir A. W. FRANKS has not elucidated. He is the most learned officer of the British Museum, and without him it would soon sink to an inferior level. But the generosity of Sir A. W. FRANKS is on a par with his knowledge of antiquity. There is scarcely a year passes without his enriching the national collections, and in that way he has expended a small fortune. The Master

of the Company of Playing Card Makers estimated the value of the gifts of Sir A. W. FRANKS at 50,000*l.*, but, unless we are mistaken, a much larger sum would more correctly represent his expenditure in securing treasures of various kinds for the British Museum.

THE last number of *L'Art* contains about two hundred pages, and may therefore be considered as a volume rather than a periodical. Few volumes published recently possess so much interest for artists and amateurs. One of the etchings gives an admirable "impression" of a part of Paris on a wintry day. Another of the Comtesse DE MERCY D'ARGENTEAU expresses a combination of sweetness and suffering. M. EMILE MOLINIER has a learned address on the "Origins of the Decorative Styles of the Middle Ages," in which the influence of Eastern models is explained. M. CHESNEAU presents another instalment of his investigation of the principles of pre-Raphaelitism, which would do credit to any English student of the movement. M. PAUL LEROI, with his customary omniscience, treats many subjects, and among others the career of the late PIERRE VICTOR GALLAND, who was rarely surpassed as a decorative artist, while his easel pictures were sufficient by themselves to make a reputation. The illustrations in the pages are numerous, and exemplify many varieties of modern work; the initial letters by M. HABERT DYS are not the least remarkable. Altogether the part has permanent interest, and is creditable to the enterprise and good taste of the conductors.

THE rumour about the purchase of the Château de la Muette outside Paris by an English company, with the intention of covering the grounds with villas in the latest style, has disquieted Parisians. Their interest in the place is incomprehensible. That FRANCIS I. built a kennel there, that LOUIS XV. reconstructed the buildings which became the "Parc-aux-Cerfs" of ignoble memory, that MARIE ANTOINETTE supped there with DU BARRY, that the first balloon ascended from the grounds, and that the municipality gave a banquet to fifteen thousand guests in the gardens may be granted, but all these associations are of no importance. Of the old château only one pavilion remains, and it is of little architectural interest. There are of course the gardens, which are the more remarkable from their position so near Paris. The ground is undoubtedly a tempting sight to a building speculator, stretching as it does from the Bois de Boulogne to the railway station at Passy, and sooner or later it is certain to be utilised for building sites; but for the present there will be no change. Count DE FRANQUEVILLE, who represents the family of the ERARDS, the piano makers, who since 1820 have possessed the property, declines all the offers made to him. But it is remarkable that the Parisians should take so much interest in a place where kings and citizens took pleasure in degrading themselves.

It could hardly be expected that the sacrifice of the Palais de l'Industrie on the Champs-Élysées, in order to allow of the construction of a new approach to the International Exhibition of 1900, would be approved by the artists who have gained reputation by the Salon exhibitions. M. BOUGUEREAU has lost no time before protesting against the demolition. He maintains that not only the Palais, which he says cost 12,000,000 francs, will be sacrificed, but the beauty of the Champs-Élysées, the most beautiful of promenades, will be affected, or rather massacred, by the proposed innovations. M. BOUGUEREAU says he will be charged with a desire to maintain the Salon at all costs. He asks in reply whether that institution is not one of the glories of France, and one which excites the envy of other nations? On that account is it not the duty of all Frenchmen to endeavour to conserve the Salon? Who would care to see French artists compelled to seek in foreign cities the galleries in which their works should be exhibited? The authorities of the Exhibition declare that the artists who are attached to the Salon will not suffer by the proposed works, but who can guarantee that the artists will be provided hereafter with galleries gratuitously, as is the case at the present time?

The Architect, April 5th 1895.





INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

MUSIC.
A STATUE by M. DELAPLANCHE.

NEW BRANCH PREMISES
for the
LEEK CO-OPERATORS
Lamer Sugden FRIBA.
Architect

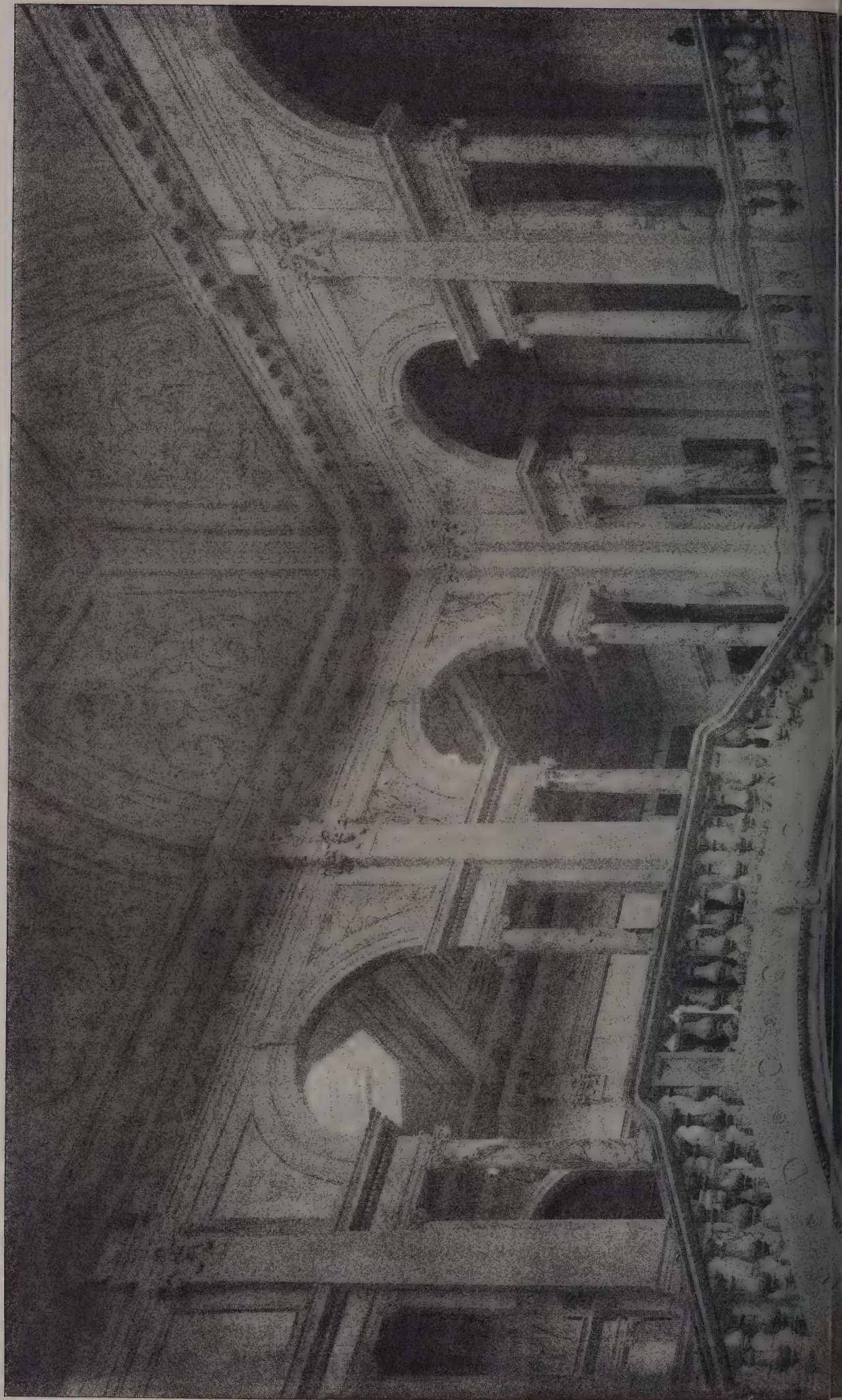


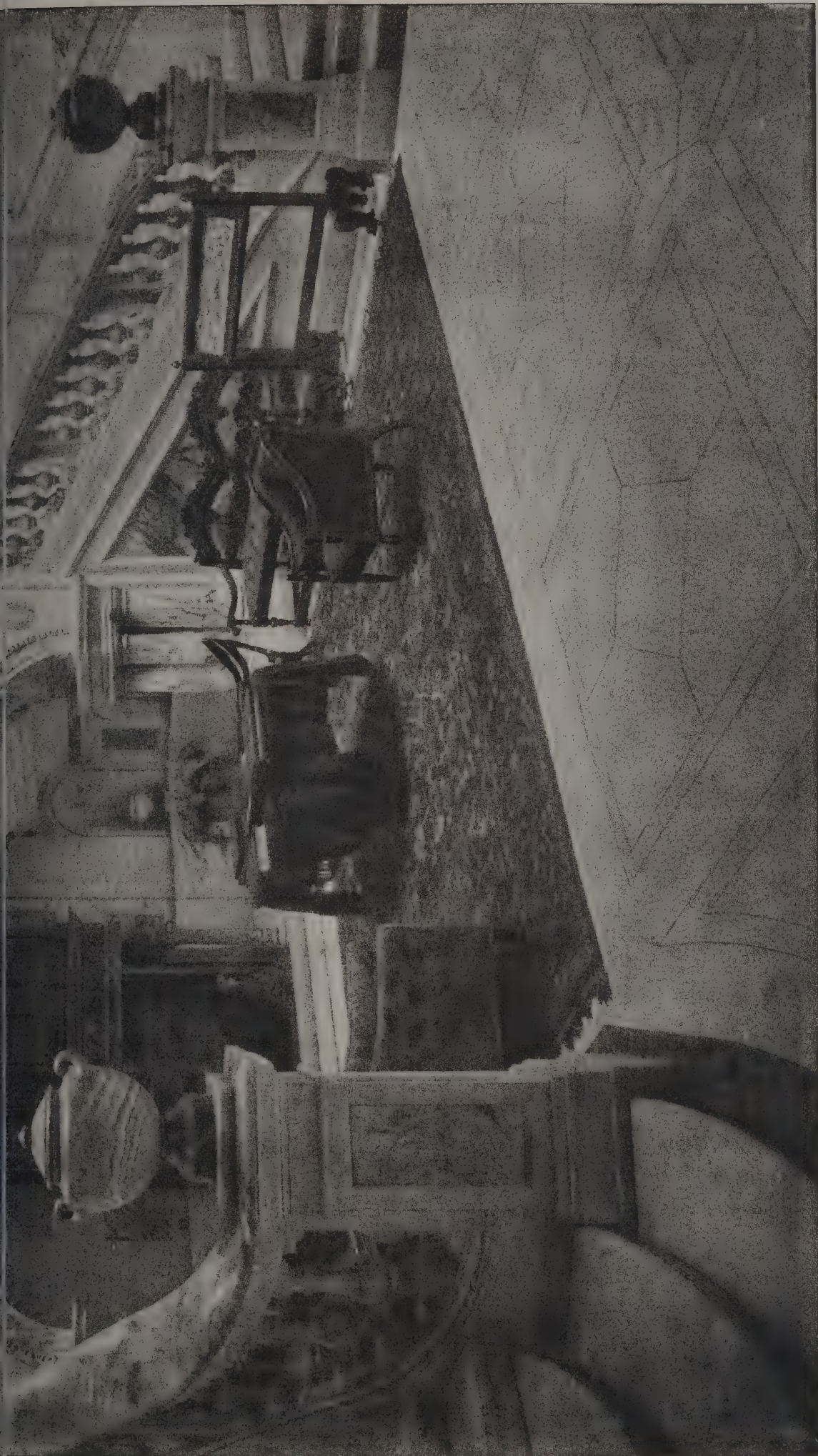


INK-PHOTO, SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

ALMSHOUSES, BIDEFORD.
FOUNDED BY MR. JAMES COLMER.
ALEXR. LAUDER, Architect.

The Architect, April 5th 1895.





PHOTOGRAPHED BY BEDFORD LEMERE & CO

INK- PHOTO. SPRAGUE & CO 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

GREAT HALL AND STAIRCASE: GOSFORD HOUSE, LONGNIDDRY, N.B.
WM. YOUNG, Architect.

ILLUSTRATIONS.

MUSIC.

NEW CO-OPERATIVE BRANCH STORES, PICTON STREET, LEEK.

THE buildings which we illustrate are about to be erected to the plans and under the superintendence of Messrs. W. SUGDEN & SON, F.R.I.B.A., at a cost of 1,000*l.* for the first section of grocery stores only, and the enclosure and gravel paving of the site for extension, and the general sewer. The drapery and meat stores will be built later. The grocery store is 40 feet by 20 feet. The warehouse, &c., floor area—in cellaring and on ground and first floors—in connection with it, is about 430 square yards.

The advertisement for tenders contained the following proviso:—"The architects are instructed to require the payment to the workmen of the standard union rates of wages, and not to permit the introduction of 'sweated' goods. A schedule of hours and wages (as in London County Council works) will constitute part of the contract." So far from this acting as a deterrent to respectable builders tendering, out of the twenty-six builders (various trades) in Leek tenders were received from twenty-two, a very unusually large proportion. Tenders were only invited from Leek builders, the co-operators preferring to find work for their own townspeople.

The present building will have glazed brick brown pillars between the oak shop-fronts, and cream-coloured glazed brick linings internally where necessary. The upper storey will be rough cast outside, the woodwork being painted a bright green, insuring, with a red-tiled roof, a simple effect of cheerful colour. The larger portion of the flooring will be fireproof, of an inexpensive character. The heating will be by low-pressure hot water, and the flour-shoots and bins, &c., and other fittings, will be of the latest and most improved types.

ALMSHOUSES, FORD, BIDEFORD.

THE almshouses are built on the main road from Bideford to Clovelly, on the site of the birthplace of the donor, who has adequately endowed the foundation as the habitation of two elderly couples of Alwington; Parkham or Buckland-Brewer. They are built of a wrought grey local stone, with Bath freestone dressings. The whole of the internal fittings are in pitch-pine, and the walls ornamented in sgraffito plaster in three colours.

A tablet of polished granite bears the following inscription:—

"1893. To the glory of God, these Almshouses are erected by JAMES COLMER for the benefit of the poor of his native parish. 'All things come of Thee, and of Thine own have we given Thee.'—I Chron. xxix. 14."

The architect is Mr. ALEXANDER LAUDER, of Barnstaple, and the builder, Mr. R. LOTT, of Ford.

GREAT HALL AND STAIRCASE, GOSFORD HOUSE, LONGNIDDRY, N.B.

THE ARCHITECTURAL ASSOCIATION.

THE fortnightly meeting of the Association was held on Friday evening, Mr. E. W. Mountford, president, in the chair.

Mr. BANISTER F. FLETCHER, in the absence of the author, read the following paper:—

Specifications from an Architect's Point of View.

Mr. Pinks, the author, said:—In reading a paper before you with the title of "Specifications from an Architect's Point of View," a word of explanation is necessary perhaps to account for a surveyor undertaking the task. Our interests are identical, and as the surveyor is frequently left to explain the architect's intentions in the specification, there is no reason why he should not be able to look at the matter from the architect's point of view. Of course, you must understand I am speaking my own views only in what I am about to say, and not those of any architect or architects in particular; but I hope the remarks I have to offer will not be considered out of harmony with the title of the paper.

I regret I cannot introduce to your notice anything novel or

fresh in the art of writing and arranging the clauses of a specification; neither can I suggest any improved or rapid method of preparing the document. But I propose to examine critically the specification as it is; to pass from that to a consideration of the necessity of specifications as they are at present drawn, and thence to a few suggestions for the abolition of specifications as separate documents in a contract.

Take one of the latest of our specifications. Does it not strike you that it is an inordinately lengthy document as compared with those written, say, twenty years ago, and that a mass of matter is now squeezed into its pages that serves only to perplex the clerk of works and worry the builder? Does there not seem a desire to make a record of length and number of pages? Why, even a moderate-sized house requires at least 100 pages of specification nowadays to adequately describe the best way of building it. Perhaps you may urge that a great deal of this is due to the fact of the surveyor writing the specification, but that is not really so, for if a surveyor had his way he would make the specification simply a reduced copy of his bill of quantities, and a specification frequently exceeds the number of pages of the bill of quantities. I think a great deal of the extra length can be accounted for by the introduction of most of the "conditions of contract." These properly belong to the "contract" as the legal document, and only cumber the pages of what should essentially be the working document. An objection also to the incorporation of legal clauses with those necessary for the builder's guidance is that a possible slight variation in the language of a legal clause which appears in the specification and contract may lead to litigation to settle the difference. I know of a case in which the specification gave as the time to complete the building eighteen months, and in the contract, by an error, it was stated as eight; but it caused much delay and squabbling before the difficulty was settled.

Another cause of lengthiness is the way in which expanded descriptions of trade manufacture are worked in. I saw a specification the other day in which the architect or his surveyor had devoted some three or four pages to a technical description of how to make terra-cotta. I do not suppose the makers would be influenced in the least by this, certainly not the builder, for each manufacturer would have his own way of doing it, and would not vary the custom of his works to suit a particular specification.

Do the wonderful little essays on how to lay drains, make terra-cotta, mix cast-iron, test steelwork or ironwork, which we find in so many specifications, protect our clients or help forward to any serious extent the good and efficient workmanship and materials we all desire to see?

The system of splitting up a specification rigidly into trades has much to answer for in introducing elements of confusion and differences. Each architect has his own view as to where a certain article should go, and if he consistently follows out the trade system, what a number of references have to be made before you find out all about a window, for example. On one page the sash and frame; on another probably the fastener and sash-lifts; on another the iron tongue; on another the linings and architrave; elsewhere the glass, and so on. There are many of these cases where four or five references might be profitably put together, especially when you remember that the practice of allocating the items under trade headings differs considerably. For instance, tile-pavings and wall-linings get put into the bricklayer by some, mason by others and plasterer by others. Then the concrete-bed for the tile-pavings and rubbish under, and the cement surface for laying the tiles on get into different sections, and so in a simple tile-floor we may have to make four or five references before we get it complete. I need not mention many other instances of the difficulty of breaking up the specification into trades, as they will occur to all; but what I want to emphasise is that a great deal of time might be saved by combining things together a little more than is done, and let the trade distinctions take care of themselves.

The phraseology of the modern specification also leaves much to be desired, especially in the constant use of words defining quality. The words best, very best, proper, perfect, &c., are all relative terms of quality which frequently are quite differently interpreted by the architect and builder, the one using the word in the ordinary sense and the other in the manufacturers' sense. It is no uncommon thing to find in a trade catalogue the expression "extra super best," as meaning something superior to that described as "best;" and although it seems absurd to encourage such superlatives, if you want the best you have to go beyond the ordinary English meaning of the word, and accept the grandiloquent language of the catalogues. The word "proper" is a frequent stumbling-block, and its use should be discouraged as much as possible, especially in the sense in which we find it, as for instance "fir proper door frames." These relative terms of quality should be quite abolished, and the definite expressions of the manufacturers used instead, as by so doing we shall, as regards materials at all events, have a common basis of agreement with the builder. At present quality is left too much to the imagina-

tion, and is only implied when it can and should be stated in exact terms.

A common defect is the frequent disagreement between the specification and the drawings it is supposed to describe. In the great majority of cases this arises from the habit of writing a specification and using an old one as a model, and so we get materials specified which the architect does not intend to use, and when the work is being carried out points of difference arise. If quantities are supplied the surveyor can easily adjust the variations in description; but, assuming their absence, each person tendering puts his own construction upon the clause, with the inevitable result that whichever way the architect wants the work done an extra ensues. Of course there are builders and builders, and the architect has to be prepared for the worst type in these days of close competition.

I think the subject can be narrowed down by asking yourselves which do you consider the most important part of the contract—the specification or the drawings? I need not pause for a reply, because, of necessity, the drawings must be the paramount factor with the architect and builder, although the employer often attaches more importance to the specification, probably because he understands and can criticise a written description, whereas, alas! drawings to the average employer are like maps to a South Sea Islander.

Does it not come to this, then, that more work on the general or small-scale drawings, and less in the specification, would tend to considerably reduce the friction between architects and their clerks of works and the contractors? Carry this idea to its legitimate conclusion, and half the causes of dispute would disappear.

This brings me to the second division of my paper, viz. a consideration of the necessity of specifications as they are at present drawn.

You will perhaps have gathered from my remarks that I am not in favour of lengthy specifications, and I must confess I think they are drawn out to an unnecessary length, without the least equivalent in the way of further security from bad materials or scamped workmanship. And I now have further to admit my conviction that the specification goes out of its way and out of its true course when it ceases to be anything more than a description of materials. It seems to me that the necessary documents or instruments of a contract should be, first, the plans, elevations, sections and detail drawings; second, the description of the materials to be used, which of necessity must be a written document, and for convenience is called the specification; third, the conditions of contract or legal restraints by which you bind the builder to do the work in accordance with the plans and specification, and also bind the employer to pay for the work done.

To successfully carry out this idea it will follow that the small-scale drawings must be prepared with perhaps a little more care and with considerably more detail than they generally are at present. I believe much greater attention is being paid to the small-scale drawings than used to be the case, and I know many architects whose drawings are so clear, detailed and annotated that a specification is almost a superfluity. From this I know it is possible for the thing to be done, and if it were adopted as a system it would be perfectly easy for the draughtsman to add, either by writing or graphically, to the general drawings most of the information which now burdens the specification.

For instance, taking the elevations, why should you not express, once and for all, by printing on the drawings the facings you want, the arches, whether axed or rubbed, the parts of the work in Bath, or Portland, or in both, the parts to be cemented or rough cast, the windows which are to open and which fixed, the glass to be used, and many other things? On the plans, why should you not say what flooring or paving you require, what the hearths are to be, what thresholds, what roof-covering? On the section, the sizes of floor-joists and roof timbers, the descriptions of skirtings? Once on the drawings they are done with, few queries would arise, the surveyor will get through his work quicker, the foreman and clerk of works will not be divided between something on the drawings and a contrary description in the specification.

This all may mean rather more work for the architect at first, but will not the apparent loss of time amply repay him in the end, and certainly save delay on the works? A specification of one hundred pages takes quite a week to write, and even then is by no means a perfect document. Human fallibility enters very much into specification writing, and it is impossible in a written document to notice small errors without a close examination; whereas a drawing can be read by those who make them, and errors detected literally at a glance. Supposing, instead of devoting a week to writing a specification, you gave that week to finishing up and noting the drawings, what a tremendous difference it would cause. I am sorry to suggest more work to those who, perhaps, are already fairly burdened; but I believe it would be more congenial to the majority to spend the week on the drawings rather than on the dry work of specification writing.

Surveyors do occasionally find a set of drawings with all the sizes of timbers figured on, and what I now plead for is an extension of that principle to almost every detail in the building. To satisfy these conditions a set of drawings would have to include a little more detail work, especially in the sections, and the draughtsman would have to put his section lines where they would show most work, instead of shirking the stairs and the lantern lights, as they often do at present. A plan of the roof timbers would also be desirable, and some of the joinery details should certainly be among the drawings.

Assuming you intended carrying this idea into practice (of putting work on the drawings instead of into the specification), the following, I think, would be the additions:—On the plans: the floors would have the material stated and the thickness; as to how the floors were to be laid and the kind of jointing, that would remain in the specification without a detail showed it. The pavings also would be described, and the hearths, steps, stairs, the direction of the joists and strutting, and the trimmers and trimming-joists which might not possibly appear on the sections. On the sections: the skirtings, dado and picture rails, cornices, architraves, thicknesses of doors—description of plastering, whether cement or lime, also the dadoses and tile-hangings. On the elevations: the facings, arches, mouldings, rough cast, timbering, tile-work, what windows fixed and which to open, the glass, the external doors, the window-sills, steps and stonework generally. The roof plan would show at a glance which slopes were to be covered with inferior and which with better slating, also the lap, and whether boarding and felt; the roof, whether tile or lead, the flashings and lead flats, and every other item which at present it takes a few minutes to find in the specification.

This system would save all the difficulty one experiences in trying to locate the position of a certain thing, say a roof slope; you use up all the points of the compass, and you find one part which will not fit in to a concise description. The surveyor takes the slates, say, as of the superior kind, the builder, perhaps, reads it differently and puts the inferior kind. If the drawing showed by a note or distinctive colouring which was meant, all must read it in the same way.

From the drawings we turn to the specification, as I suggest it should be, and we shall find more than 75 per cent. of its bulk is gone. In the preliminary part all the legal clauses, such as protection, damage, insurance, payment, time, sureties, rates of wages, will all be relegated to the contract. In the excavator and bricklayer all the descriptions of materials will remain in, and the way they are to be mixed and used, but all such items as depths of excavations, thicknesses of concrete, beds of brick rubbish, thicknesses of walls, mortar, fireproof floors, drains, facing bricks, parts in cement, finishings of internal walls, arches, moulded and gauged work, air bricks—all these would be cut out, as the drawings would show them.

The mason would describe the materials and setting; all other work would appear on the drawings. The slater also would describe the materials and nails to be used. The carpenter would give the usual descriptions as to materials and a general clause about providing all wood, bricks, fillets, slips and backings. The joiner would also give the description of materials and method of laying and jointing the floors. Sizes and number of hinges, and prices of locks and furniture (although this could be quite easily put on the details). The founder and smith would state descriptions of materials and tests, also any ironwork hidden away. All straps and bolts, railings, girders and joists, rain-pipes and eaves-gutters would appear on the drawings. The external plumber's work would all appear on the drawings, and only the materials specified. The internal plumber-work is a little more difficult to dispose of, and until detail drawings are given for this work it would have to remain in the specification certainly as regards small pipes and taps. The plasterer would only describe the materials and the proportions. All glass would be indicated on the drawings, and therefore the trade would consist of a line or two. The painter would remain very much as at present.

I have taken a specification of 120 pages, and by cutting out the items which I consider might be fairly described or shown on the drawings, I find it gets reduced to 32 pages, which includes some four or five pages for provisional sums and other items for which drawings would not be given. The reduced specification which I suggest would be practically a stock document, requiring little if any alteration, except as regards provisional sums, and any alteration it did require would be so slight that an hour would be sufficient to make the alteration. I think this would be a considerable advantage, and the saving of time would be considerable also. Given a good workable set of drawings, fully noted, with several sections and elevations, and a concise description or specification of the materials to be used in place of the present lengthy one, and I believe good work and little friction would result. Engineers, to a very large extent, adopt this system with their work, and I have never heard that it suffers, or that it increases their labour. The third division of my paper will probably meet with some opposition, for I propose in this to abolish the

specification entirely when bills of quantities are supplied, and utilise them in its place. I say that I expect some opposition to this proposal, because I know that there are some difficulties in the way, not the least being that employers know of the specification, and usually expect to see it, whereas bills of quantities to them are unknown. Then again public bodies, such as the Charity Commissioners, require to have the specification submitted to them with the drawings. But these difficulties could probably be overcome by a modified specification such as I suggested just now. Some architects also do not avail themselves of quantities in obtaining tenders, and to these of course the suggestion would not appeal—others again do not have quantities but have the work measured up at the end. In either case some form of specification would still be required. But as regards difficulties in combining the bills of quantities and the specification I may point out that in Scotland the specification, apart from the bills of quantities, is almost unknown—and, as far as I know, and my experience on this point is not entirely theoretic, no inconvenience is experienced. Of course usage is, and always has been, a great bar to improvements or alterations of any kind, and the natural conservatism of human nature is not weaker in professional circles than in others, perhaps stronger.

I can imagine some architects objecting to the change because it would give too great a prominence to the quantities, and that it would necessarily result in the quantities becoming a part of the contract. Why they should not be I can never understand; the employer pays for them, and they are generally used for the purpose of settling up accounts. The clerks of works refer to the quantities as much as to the specification when they are allowed a copy; but, of course, as they are merely statements of fact and not descriptive, they are not so useful for reference as they might be. I know there are many surveyors who would strongly object to the change, as they hold the view that the quantities are only for the purpose of assisting the builder to make his tender; but I combat this theory, for in the bills we have a perfect specification if only descriptions indicating their destination in the work were appended, and if it is possible to use them as a specification it would tend probably to economy. It is perfectly true also that to one unacquainted with the arrangement of a bill it is a complex medley of figures and descriptions; but this is caused very much by the trade system, as in the specifications being rigidly adhered to, and, I am afraid, by a little perversity on the part of some surveyors to increase rather than reduce the complexity. Well, all this would disappear if the specification and bills of quantities were merged in one; we should then have the quantities as a rigid statement of facts, with the requisite descriptions of the specification. As I said before, the Scotch schedule of quantities is specification and schedule, and where we have in England references by the builder to what the specification says, in Scotland he refers to what the schedule states. What is possible there should be so here.

Surveyors ought not to object to the proposal, but ought to welcome it, as their work would be brought into greater prominence and into a wider sphere of usefulness than it is at present. For the architect would have it at hand for constant reference to settle points in connection with the details; the clerk of works and foreman would also use it, and many extras which are now incurred in ignorance, through the bills of quantities being sealed to them, would be avoided. A certain class of surveyors, I can understand, who would object to the change, viz. those who prepare bills of quantities for ridiculously low commission, and to protect themselves against possible errors "amplify" their quantities. To those who add a few rods of brickwork to cover the lack of proper details, or increase the stonework to cover other things, a combined bill and specification would not be acceptable, for the essence of the document would be in its exactness in all parts. I am sure respectable builders do not care for this haphazard quantity system, although it frequently gives them more of one thing than they are entitled to; what they require is that a bill of quantities shall be a fair representation of the work in the building. I am prepared to admit that the bills of quantities might be rather longer, that is to say, they would be as at present, plus the necessary detailed description of positions in the building; but a saving would be effected in the printing or copying of the specifications and the extra time spent on the bills would be saved in the time usually spent in writing the specification. I do not wish it to be understood that this method would do away with the necessity for detail descriptions on the drawings, but I do believe it would relieve many architects who dislike specification writing from a labour which is irksome to them. How the bills of quantities can be made to answer both purposes I need hardly suggest to those here who do such work; it is a matter of small technical details, and would simply necessitate a careful arrangement of the items, so that each would state its location in the building. Generally I may say that I should group the items together, so that you could, by the quantity given and the description, see at once where the work was intended to go. It would be

impossible for me to give every detail this evening, but I have, I hope, given you enough to grasp my suggestions. The proposal of adopting a shortened specification is one worth considering, but the latter I consider the most important and also one which, I believe, will be the system adopted in the future.

Whether I have justified the title of the paper I leave you to judge; at any rate, I have had the architect's view in mind all through, and although I have advised more work on the drawings, I have by suggestions reduced the specification writing to a very small part of your work, and also have ventured to suggest the total abolition of a document loved by neither architects nor surveyors.

Mr. A. HOLLOWAY read the following paper on

Specifications from a Builder's Point of View.

The subject of this paper was suggested to me by your hon. secretaries, and at their request I have prepared a few remarks on specifications from a builder's point of view, but at the same time I have endeavoured to avoid airing any personal grievances or propounding any special fads and crotchets of my own.

I have great pleasure in being here to-night to discuss such an interesting subject, especially as I have the satisfaction of meeting my friend Mr. Pink in friendly contention, to discuss the matter from two opposite points of view. If there are any hints I may venture to offer, I trust that they may be taken as offered as such, and not in any way condemning architects' specifications or of taking upon myself the position of instructor or censor to architects in regard to this very important part of their professional work. You will not, therefore, expect from me a full and comprehensive specification embracing all subjects, nor any proposals for revolutionising its form and purposes, but rather the terms on which the general idea of a specification should be based, with the hope that it may tend to prevent difficulties and misunderstandings between the architect and the builder.

I should like to take the opportunity of bearing my testimony to the manner in which, taken as a whole, the architects discharge their most difficult and onerous task of dealing with fairness and justice to the contractor, while at the same time acting with loyalty towards their client. During the many years my firm have been in business we have experienced but two or three instances where there has been a grievance against the architect, and although we wisely insist upon the arbitration clause in the conditions of contract, we have never yet availed ourselves of its provisions, neither have we had recourse to a court of law, excepting in one instance, and even in that case it was no reflection against the architect, as the point at stake was entirely a question of prices, upon which he had been badly advised by the quantity surveyor.

My first suggestion may appear trivial, but from a builder's point of view it is of some importance, namely, the form and arrangement of the specification should be in the simplest language, carefully prepared and legibly written, also set out in clauses and under proper headings, with margin or heading notes, each paragraph being indexed. Remember, it is always essential that the architect's copy should be on the job. The general foreman is not often blessed with a college education. Don't send the specification copied on tissue or letter-pressed copying paper, which is in shreds before it has been on the job a month. In these days of cheap and expeditious printing I venture to urge that printed or lithographed copies be supplied.

The conditions of contract should be attached to and form part of the specification. It is not necessary to discuss the form of these conditions, as I presume all architects will loyally adopt that agreed to between the architects and builders' institutes.

The quantities should be in conformity with the specification, consequently the draft specification should be in the hands of the quantity surveyor before he proceeds with his work, but a little latitude might with advantage be given to the surveyor to vary or add to in minor points, in order to bring the drawings, specification and the quantities in perfect line with each other.

The practice of specifying sub-contractors and specialists is increasingly resorted to, in some cases almost to the extent of having separate firms for the principal trades. Architects who have had works in the North of England, and adopted the system of employing a separate firm for each trade, know something of the inconveniences of this course of procedure. The practice, generally speaking, increases the cost, causes delay in execution, and creates a considerable amount of friction between all concerned. In cases of special works for which special men are required, such as are not usually engaged by the builder, or in the fixing and arrangement of patented goods which the patentees have to guarantee the efficient working and durability of, it may be desirable to provide for the sub-contractor to completely finish his work. But this custom should be minimised as much as possible, so as to give the builder entire and complete control over the whole of the building in course of erection, as he has to be responsible for

everything. In all cases where sub-contractors are engaged by architects there should be an undertaking from the sub-contractor to comply with the conditions of the builder's contract as far as the same are applicable to his work. Unpleasantnesses frequently occur between the builder and sub-contractors through the omission of the architect insisting upon this point. It is urged by architects that this is a matter between the builder and the sub-contractor, but it is obviously more desirable, and only just to the sub-contractor, that this condition should be agreed upon when the latter prepares his estimate.

Probably the bulk of the builder's difficulties arise from a want of definiteness in the description of the architect's requirements. General "covering" clauses in specifications are much too frequent. If the architect has a difficulty in regard to his working drawings, or in connection with the site of the proposed building, and is unable to specify precisely what has to be done, he has recourse to his familiar "friend" (the covering clause), and throws all responsibility upon the unfortunate builder. Here is an extract from a specification as a sample of what I mean.

"Do all necessary cutting and making good. Supply all materials and workmanship necessary, although not herein specified, to render the whole of this branch of the trade perfect and complete to the entire satisfaction of the architect."

The same clause, with a little variation, appears after each trade.

Such conditions as these have only to be exposed to be condemned by reasonable men, but unfortunately they appear only too frequently in specifications. In cases where it is impossible for the architect to specify clearly and in detail, and for the quantity surveyor to measure, the work to be executed, the proper and just course to adopt, both to the client and the builder, is to provide an amount to be used under the architect's directions, and the work paid for either by valuation after completion or charged for as day work. There is frequently much indefiniteness in the specification with regard to foundations. The builder has to take many risks for which he has very little opportunity of forming any idea as to whether it will involve an expenditure of 5*l.* or 500*l.* My firm recently tendered for a building where it was impossible to judge of the character of the subsoil to settle the depths of the foundation, consequently a schedule of prices for extra depth of digging and concrete had to accompany the tenders.

The prices for the extra digging varied from 18*s.* to 6*s.* per yard cubical. The firms tendering were a selected list, and all well-known responsible people. This difficult and unfair position can be easily removed by the architect obtaining the particulars of the soil by means of trial borings, which can be done at a trifling cost.

There should be always a practical reason for what is specified, and nothing should be specified unless the architect thinks it absolutely necessary to carry into actual execution. Also care should be taken not to specify what is a practical impossibility.

The following are a few specimens taken from specifications to illustrate my point, viz.:—"The excavation to the trenches is to be taken down to a perfectly solid bottom, and the bottom well rammed." One naturally asks, why ram when you have a natural solid bottom? Is it not possible that if ramming is enforced you will not have a good solid bottom? Supposing the foreman carries out the specification, digs the trench to the depth shown in drawings, and has the bottom well rammed for the architect's inspection, it is possible the architect may be deceived by the sound appearance of the bottom and have the concrete put in upon what is anything but a natural sound foundation.

"The concrete in trenches to be well rammed." The absurdity of this description is obvious. To ram concrete immediately it is thrown into the trench in a soft condition is quite useless and a waste of labour, and if rammed after it has commenced to set it would only tend to prevent its adhesion.

"The stock bricks are to be hard, well burnt, perfectly square and of uniform colour." It is only necessary to visit a brickfield and see the making of stock bricks to know the impracticability of this description. The description is quite contradictory to the nature of stock bricks, which are burnt in large stacks, or clamps, of about half a million each, with fuel sprinkled between to help the firing. The bricks that get the strongest heat will be the hardest, and as a matter of course to an extent flared and varied in colour. The weight of such a large quantity stacked together before being burnt must of necessity press the bricks somewhat out of square. The beauty of stock-brick facing to my mind is the slight variation of colour.

"The mortar to be composed of one portion greystone lime to two portions of clean sharp sand." Either the proportion specified is not expected by the architect or he must be ignorant of the proper proportions of lime and sand for good mortar. There is no strength in the lime of itself. The proportion of one of lime to four of good clean sand makes the best mortar.

Particular quarries for stone are frequently specified (especially Yorkshire stone) which have been worked out for several years. It is desirable as far as possible to avoid the mention of particular quarries unless the clause is modified by the addition of the following:—

"Or stone from some other quarry equal in quality to that specified."

Perhaps the most difficult part of an architect's specification is that in reference to timber, and the builder finds it more trouble than all the other kinds of material combined. The architect generally makes certain ground for himself by specifying that it is to be "perfectly free from sap, large knots, shakes and all other defects." Such a description is very admirable if the material can be so supplied, but it is perfectly well-known that this degree of excellency cannot be maintained, hence the difficulty of interpreting to what extent sap, knots and shakes will be tolerated. Unfortunately the opinion of clerks of works (to whom this is usually referred) varies very considerably according to their knowledge or other contingent circumstances. It is a mistake to suppose that because there is a slight discolouration on the edge of the timber it is unfit for use. Care should be taken to see that no sappy wood is built into a wall or fixed in a confined position where there is no air space; but for open roofs, floor-joists and such like the timber will not rot or become weakened because of a little blue sap, which is frequently only surface deep. I have been asked by architects to suggest a suitable and reasonable description for timber and joiners' deals, but have always found it a difficult task to do so. Specifying by means of names of ports and brands is unreliable, as the goods scarcely ever maintain the same quality for two or three seasons together. For a few years a splendid quality of joiners' deals had been imported from the Archangel port, but last year it was much below the average, and a large proportion of it quite unfit for good class joiners' work. With considerable diffidence I venture therefore to suggest the following as a reasonable description for timber and joinery deals, viz.:—

For the Best Class of Work.—"The Memel or Dantzie timber of the best-selected middling quality."

For Ordinary Class of Work.—"The Memel or Dantzie timber of the good middling quality, or (where scantlings under 11 inches wide and 4 inches thick) from sawn scantlings of an approved Swedish or Russian port, not inferior to a recognised good fourth quality Swedish brand or third quality Russian hammer brand."

"All timber to be free from large and loose knots and shakes, also practically free from sap to the architect's approval."

For Joiners' Deals.—"Good quality from approved Swedish or Russian ports, free from large and dead knots, shakes and sap. Not inferior to a recognised first and second quality Swedish brand or second quality Russian hammer brand."

Pitch pine and Oregon pine are much used for timberwork, also yellow pine for cabinetwork, but neither of these American woods are suitable for positions exposed to weather and damp. But for interior work it is much cleaner in appearance than the Swedish and Russian goods.

A point requiring the special consideration of an architect in preparing his specification is that of fixing the time to be allowed for the execution of the work, particular regard being given to the period of the year at which the building is to be completed. It frequently happens that a job, say of a new house, or an addition to a house to the value of 2,000*l.* to 3,000*l.* containing a quantity of good joiners' work is commenced in July or August, and has to be completed by the Christmas following. The specification insists that the joinery work must be of thoroughly seasoned wood, roughly framed together, and put into drying-room within a month after signing the contract. (By-the-by, notwithstanding the stipulations, it too frequently happens that the details are not supplied until after the roof is on.) A moment's thought must satisfy anyone with practical knowledge that to put good seasoned joinery into a building erected under such conditions simply means ruination to the work, and ultimately serious trouble and expense in easing doors and windows, stopping open joints, touching up shrinkages, &c. Moreover, the builder is condemned for supplying inferior material. In all cases where good plastering and joinery is required, architects should make arrangements to avoid either of the same being proceeded with to any great extent during the winter months.

In conclusion, I would urge that in order to avoid friction, disputes and to secure good work, there must be mutual confidence between the architect and builder. To secure this the architect should only invite to tender (where competition is required) those with whom he can take counsel and place confidence. There is far too much suspicion, especially on the part of the younger members of the profession. I do not deny there may have been reasons for it, but, speaking generally, builders have a regard for their reputation. They know that one act of rascality exposed means ultimate ostracism. On the other hand, a good sound building is a standing advertisement.

Many little misunderstandings and difficulties would be obviated if there was more personal intercourse between architect and builder, especially upon the building. This course has been adopted with most of the architects with whom my firm have done business for any length of time. With these gentlemen we have never experienced the slightest trouble in complying with their requirements and giving every satisfaction.

The lot of a builder in these times of keen competition, unreasonable demands on the part of workmen, fluctuations of trade, losses by stress of weather and the exceptional worry arising from what is probably the most uncertain and risky commercial undertaking in the country, is by no means an enviable one. I therefore appeal to you to have some regard to the peculiar difficulties with which the builders have to contend, and urge you to do your part in promoting a good understanding and mutual confidence between the profession and the trade. I can assure you on behalf of those whom I have the honour to represent that such good feeling and confidence will be heartily appreciated and reciprocated.

On the conclusion of the paper several members joined in the discussion, viz. Messrs. Fleetwood, E. Woodthorpe, Francis Hooper, H. Pratt, Brodie, Stockdale, Max Clark, and Lough (Simpson & Co.).

A vote of thanks was passed to the two gentlemen for their papers, which Mr. Holloway acknowledged, and the meeting terminated.

CARPET DESIGNING.*

THE questions, what are legitimate subjects for carpet designs, and within what limits is the right treatment of those subjects to be confined, are not easy to answer. Let us first consider why a carpet exists at all, and next, how it is used. In this country, at all events, it exists first for the sake of warmth, next for noiselessness, and lastly for comfort and ease apart from warmth. For all these ends it is desirable that it should be moderately soft; and though we should not be led away by a mere play upon words, there is, I think, sufficient relationship between softness to the touch and softness to the eye in form and colour to justify us in laying down the rule that a fabric which necessarily has this quality in its first sense should, by its treatment, suggest it in the other two. I know that many fine Eastern carpets directly violate this rule as regards form. They are often extremely harsh and angular in design, but this is amply atoned for by their colour, which in the best examples, however strong the contrasts may be, is always mellow and soft. And the angular geometrical designs are successful, not because they are angular, but in spite of their being so. This is very well seen in the magnificent work on Eastern carpets lately published in Vienna, where nearly all the specimens are represented twice; in black and white, and in something like their original colours. Some, as shown in monochrome, are absolutely uninteresting, while others are in that form even more beautiful and suggestive to the designer, and, paradoxical as it may seem to the colourist, than in the polychrome versions which purport to be faithful reproductions of the originals.

In the next place, as a floor is flat the decoration of its covering should be the same. It may seem strange that a carpet manufacturer should gravely enunciate a counsel of perfection of this kind, seeing that the bulk of the designs produced in this country do not comply with it. I need not repeat what I said in this place last year in explanation of the difficulties in which manufacturers find themselves owing to the necessity of producing what the trade and the public demand, and I only refer to it now to anticipate a possible charge of inconsistency between doctrine and practice. I must, however, refer to a particular class of cases in which we find ourselves in a difficult position if we are to insist on flatness as essential. I mean those in which carpets have to be made to suit rooms decorated in any of the French styles, say from Louis XV. to the Empire. It is expected that the style of the carpet shall correspond with that of the walls and ceiling, and as the characteristic features of the Louis XVI. style, for instance, are certain mouldings, scrolls, festoons and so on, these have also to appear in the carpet. They can only be adequately represented by shading and so flatness at once disappears, in addition to which we have the absurdity of hanging festoons, &c., on a horizontal surface.

Now in every respect, except in the all-important matter of flatness, such carpets answer their purpose admirably. I conceive that the ideal carpet for a Louis XV. or XVI. room with light walls is one with a simple design in monochrome the filling, composed of two or three shades of a solid colour. It should be fairly dark for reasons of practical utility, and also because it gives a sense of solidity under foot and acts as a foil and contrast to the walls. The border should, it seems to me, be treated as a connecting link between the walls and the mass

of the carpet. It should, therefore, be somewhat light, and should unite within itself the colours of walls and floor, so that the eye may be led from one to the other without any unpleasant break. Now the method of shading lends itself admirably to all this. It enables us to get a filling which, though not absolutely flat in detail, has on the whole a level effect, and it is most admirably suited for the introduction of colour into the border. I have pondered much on the problem how to introduce rich colour into the border of such a carpet, preserving perfect flatness, and at the same time retaining the characteristic features of the style, but can find no solution. It is easy enough to keep the filling flat by the simple expedient of using two shades only, but this to many eyes is tame and meagre, and it is less serviceable in wear than one with a number of tints. While I condemn shading I have strong sympathy with the feeling that underlies the craving for it, viz. the desire for gradation in colour. A clear sunset sky is more pleasing than the uniform blue of mid-day, the myriad delicate tints of a tea-rose delight us more than the flat expanse of a camellia, and a piece of silk or velvet becomes much more beautiful when it is broken up into folds. In all these cases it is gradation that makes the difference. Now in other styles, notably in Persian ornament, it is very easy to combine gradation with flatness, but in the French styles it is almost impossible. If a very bold simple scroll be used as a filling streaking may be tried, as in Persian work, but if this be done without an outline the design, so to speak, falls to pieces, and an outline gives a most objectionable hardness to a damask of this kind. If flatness be absolutely insisted on, there seems to be nothing for it but to put up with a filling in two shades, and as a border of the usual type would look intolerably bald and meagre if treated in the same way, I think the best plan is to reduce it to its simplest elements, and let it consist simply of a few well-proportioned bands with a broad, plain margin. This, of course, gives up the idea of making the border a link between floor and walls, but I can see no other way out of the difficulty. Some decorators evade it by using plain carpets, a solution more satisfactory to the manufacturer, as such, than to the designer. Possibly the Gordian knot may be cut in a different way. There are signs of a reaction against the French styles of decoration in favour of modern original English work. Already, both in Germany and France, the latter is rapidly making its mark, and I am glad to say that some of our leading dealers, who are also decorators, are using all their great influence in favour of purely English work.

It will be gathered from the foregoing that I have nothing whatever to say in defence of florid designs in French and other imitative styles, so far as their drawing is concerned, though their colour schemes are often very fine, much of their beauty arising from the opportunities they offer for gradation.

Here let me interpose a suggestion that the use of simpler borders would in many cases be an improvement. Mr. William Morris is reported to have said, "The smaller the room the bigger the wall-paper." In a similar spirit of paradox I am disposed sometimes to say, the bolder the filling the simpler should be the border.

In my last paper I referred to the introduction of graded and broken tints into English reproductions of Eastern carpets as a decided advance in colouring. Here I find myself apparently at variance with Mr. Aymer Vallance, who has said that "contrasted colours are rather to be preferred than subtle gradations of hue, which are apt to give the appearance of shading and relief, a thing always to be avoided in a flat surface. A bold and clearly-defined outline is desirable, and large patterns rather than small."

I am not quite clear to what Mr. Vallance refers. If he has in his mind those subtle gradations which are not only "apt to," but are deliberately intended to give the appearance of shading and relief, I heartily agree with him; but his words as they stand have a wider range than this, and I wish to point out that, as some of the examples before you will show, gradation by no means necessarily involves the suggestion of relief, and moreover that a mass of colour may have subtle gradation within itself, and yet be at the same time in sufficiently strong contrast to adjoining masses. So that the two methods of treatment which Mr. Vallance regards as opposed to one another may be combined with good effect.

I quite agree with him in condemning the imitation of errors and irregularities in Eastern carpets when this is done in an obtrusive way. It is unpleasant to see the same mistake occurring with mechanical regularity every yard or so. But I defend the practice, not of copying mistakes, but of learning wherein the charm of such irregularities consists, and of applying the method in an unobtrusive way, so that the eye is pleased by variety and not offended by repetition.

Much might be written regarding Mr. Vallance's dictum on the use of a bold outline. I will only say that in practice many cases occur where the use of an outline is out of the question. His remark that "large patterns are more desirable than small" appears to be more an indication of personal preference than a statement which has any authority to support it. If all

* From the paper on Practical Carpet Designing, by Mr. Alexander Miller, read at a meeting of the Applied Art Section of the Society of Arts.

patterns are to be large, what are we to do in the case of small irregular rooms, landings and so forth? This appears to me to be one of those cases where theory is apt to run wild for want of correction by practical work-a-day experience.

In selecting subjects for carpet designs I suppose it will be generally agreed, whatever opinions may be held as to the desirability of copying and reproducing the work of the great ancient designers, that we cannot possibly do better than to study their choice of subjects and their method of treatment, and to follow them in both respects so far as we find they have been successful.

Now in their choice of subjects we find that practically they have taken all nature to be their province. Their designs range from the simplest geometrical arrangements of knots up to ambitious representations of hunting scenes, and so forth. And we find that in many cases they are, up to the measure of their powers, frankly pictorial. It is not uncommon to see the same class of subjects treated in much the same way in illuminated manuscripts, in painted lacquer-work and in carpets. It will scarcely be contended that in choosing such subjects as cheetahs chasing antelopes they display that unerring artistic judgment with which they are usually credited. But their genius is shown by the triumphant way in which they have treated subjects apparently so unsuitable for the floor, and have brought out their decorative possibilities. The same may be said of their treatment of trees when there is an evident attempt to treat them in a naturalistic manner.

I cannot admit that they have never transgressed the bounds of what is permissible in subject, for they sometimes err egregiously. I cannot, for instance, imagine anything more atrocious than the two lamps hanging in opposite directions which disfigure the Holy carpet at South Kensington. True they are highly conventionalised, but the motive is unmistakable.

In analysing even their most pictorial method we find that in the drawing there is the most absolute flatness. A spray or tree is laid out very much as one has seen seaweed spread upon paper. There is no foreshortening, stems rarely cross each other and are rarely broken by leaves or flowers, but are frankly displayed and often form a distinctive feature of the design. It has been said by a critic for whose opinion I have a high respect, Mr. Hugh Stannus, that in a carpet "the design should be of mass rather than line, and of leaves and flowers rather than stems," and while I quite agree with this as a general rule, as tending to give softness and repose, I think the success with which this rule has been disregarded in many fine Persian carpets shows that it is by no means without exceptions.

Here I wish to call your attention to three objects; first, a fragment, as its appearance indicates, of a very old Persian carpet, probably dating from the sixteenth century; next, a modern design, founded on English wild flowers, in which there is an attempt to treat them in the Oriental fashion, and, thirdly, a modern Oriental carpet, in which much the same idea is carried out. The latter is possibly a copy from some ancient original, but I have not been able to trace it. I may say that the second design, suggested by the old fragment, was made long before I saw the third, and, whatever may be thought of it, it will, at least, be recognised as an attempt to apply Oriental principles without copying Oriental forms.

I have tried, partly by way of a joke and partly to show how right treatment may bring the most unlikely subjects within the range of what is permissible for carpets, to treat one or two pictorial subjects as we may conceive their being treated by a Persian designer. Of course I do not offer these as serious attempts at floor decoration, but I think they show that the range of possible subjects is wider than is generally supposed.

One thing I think the Persian designers have clearly shown, that in adapting natural forms we need not confine ourselves to those which are usually seen, so to speak, in plan. Some authorities have gone so far as to lay down the rule that only those plants which naturally assume a radiating form when seen from above, such as the daisy, the dandelion, &c., are suitable for floor decoration, that in fact only those plants which are found in the carpets supplied by nature are to find a place in those produced by art. This doctrine was very fascinating when first promulgated, and it is not easy to show that it is theoretically unsound. But in practice it has a terribly cramping and limiting effect, and it is refreshing to find that in the great masterpieces it is wholly disregarded.

One of the most beautiful types of the Oriental carpet is that in which the whole design consists of one panel with a border, centre medallion and corner-pieces, the ground being sometimes plain and sometimes filled with ornament, as in the Holy carpet, which is an excellent example of the type referred to. To my great regret I have to say that carpets designed on this plan find very little favour with the public at the present time. It may be remembered that I showed one last year, and considerable surprise was expressed when I said it was not a commercial success. The reason given me by a competent authority is that since the advent of the electric light centre ceiling ornaments are no longer used, and carpets have followed

suit. Intending designers should, therefore, avoid this plan, tempting though it be.

Here I wish to point out that plagiarism of a legitimate kind seems to have been not unknown among ancient Persian designers. There is no other possible explanation of the fact that we find precisely the same motives as to general plan and details of ornament in leather book covers and in carpets, so much so that it is sometimes difficult in a photograph to tell at a glance from which of these two sources it was taken. It is certain that either carpets were founded upon bookbindings, or bindings upon carpets, or that both were taken from some common source, probably architectural, the last supposition being the most likely one. I have known English designers to be convicted of copying on the strength of a much slighter resemblance than that which exists between these two classes of work. But whatever the explanation be, does anyone regret that the copying took place? Is not the world the richer for it? If the carpet man copied from the book did he not put into the design that glorious colour in which the greater part of its merit consists and to that extent produce something new and beautiful? And are not the endless variations which have been played on this same theme each of them more beautiful things than those which would have been produced by the same designers, if each of them had attempted to create a new type? Here is abundant justification, if any be needed, for the practice I adopt and recommend of going to ancient examples of other fabrics for ideas, both of form and colour. If one does not merely copy slavishly, but puts something of one's own into the design, one has acted on the lines on which all the great decorative work in the world has been produced. And when I say "something of one's own," I do not necessarily mean an absolutely new conception. (I very much question if any such thing exists, but I must not stray into metaphysics.) If a designer takes a subject from one source, a method of treatment from another and a scheme of colour from a third, and combines them into a harmonious whole, he has made something new under the sun and probably something very much better than anyone could have produced entirely by his own inventive powers, great geniuses always excepted. The faculty of combining two or more apparently unrelated ideas and of evolving from them something which is not a mere piece of patchwork, but has an organic unity of its own is, I hold, distinctly creative in character. As Mr. Gleeson White has happily said, "Adaptation is the true originality."

It is odd that the manufacturer is never blamed for taking his colour wherever he can find it. And yet it is by far the most important element in a carpet. Why, then, should he be permitted to borrow and adapt his colour, while he is blamed for doing likewise with his forms? The only answer I can find is that those who blame him do not sufficiently realise the enormous importance of colour in relation to carpets.

Suppose the Persian designer had the suggestion made to him by a friend, "There's a nice book cover; wouldn't it make a capital carpet." If he had indignantly repudiated the idea, and insisted on being absolutely original, his work would not have been what it is. Those who think otherwise should be able to point to some absolutely new piece of ornament the parentage of which cannot be traced to some pre-existing form, a somewhat difficult task.

Let me not be understood as advocating the practice of borrowing from contemporaries, though few can avoid being at least influenced by them. But sometimes in this respect a manufacturer may be blamed without cause. A designer sometimes carries out the same idea for makers of two different fabrics, with the full knowledge and concurrence of both. For instance, I show you Mr. Arthur Silver's "Sea of Flowers" cretonne, and the same idea carried out in a carpet. It is about as unsuitable for the latter purpose as a design can well be, but Mr. Silver is not responsible for suggesting the misuse of his charming conception, which was adapted by him for a carpet to meet the taste of a foreign market.

I am sorry to say, also, that the practice of selling the same design to two manufacturers, without the knowledge of either, is not unknown, though it is more common among French designers than in this country.

Hints to Beginners.

Let me now say a few words to guide the beginner in the actual making of a carpet design. He will, of course, first decide on a particular fabric, and keep his attention closely fixed on the conditions which apply to that alone. In most cases I think the easiest plan is to make a sketch quarter full size, but if the designer finds in himself a tendency to over-elaborate his details, a still smaller scale should be adopted. A small sketch offers facilities for the necessary copying out and laying together of several repeats, and its adoption will avoid what will seem to many the drudgery of working on ruled paper, but, nevertheless, a portion at least of every design should be carried out in full-size on the special paper adapted for the fabric in view. The enlarging process is much simplified by the division of all ruled papers into squares by

heavy lines. To enlarge it is only necessary to make a tracing of the small sketch, divide it into corresponding small squares, and proceed in the usual way. This is the only way to see what is practicable, and to avoid multiplication of details, which is the fault to which most beginners are liable. Care should be taken not to run into the opposite extreme, which involves unnecessary clumsiness of drawing. When the designer has acquired the knack of making a small sketch or "model," as it is called, which contains nothing which cannot be satisfactorily put on lines, he need trouble himself no more with ruled paper. The great mass of the French designs, which are so thoroughly practical, are made quarter full size on plain paper. I cannot but think that the facility thus offered may attract artists who are now repelled by what to them is the tedious, irksome process of putting on lines.

Ordinary water-colours should not be used except for a rough preliminary sketch in which the scheme of colour may be arranged. Body-colour, that is, powder or distemper colours ground up with gum or size, is the only satisfactory medium for carpet designs. I have heard of a case in which an art teacher insisted on his pupils using water-colours mixed with white, but this method is quite unsuitable. It is absolutely necessary in a carpet design that every tint should be perfectly solid, level and distinct. There must be no unevenness and no insensible gradation between one colour and another. It should never be forgotten that each tint used has to be translated into a separate shade of yarn, and the design should be such that it is possible to count without doubt or hesitation the number of distinct tints employed. Every mass of colour, whether it be a large space of ground or a tiny dot, must be sharp and well-defined, as much so as if it were cut out of coloured paper and laid on, but of course this by no means implies that there may not be very soft gradation produced by a series of tints.

If an outline be used, it must be remembered that on the ruled paper its minimum width is fixed by the size of the "points." In a Brussels it cannot be less than one-ninth of an inch, and in Axminster it will be still broader; therefore great care should be taken to obliterate all pencil lines lest, if they be allowed to show, a mistaken idea be formed of the way in which one colour tells against another. If designs with light and shade be attempted, the methods of French designers should be closely followed, as they have a marvellous knack of getting effects of this kind in body colour and of indicating the modelling of a scroll or a flower by a few bold simple touches, which is exactly what is wanted for a carpet. In work for coarse fabrics harsh contrasts should be avoided. Much can be done to decrease coarseness of effect by soft gradation of colour, a point which Mr. Aymer Vallance has probably not considered.

As to the size and arrangement of designs for tapestry, Brussels and Axminster woven in breadths, it may be noted that fillings are invariably made 27 inches wide. There is no fixed limit for the length of the repeat, but it should be as short as is compatible with the avoidance of striping. In Kidderminster carpets fillings are made a yard wide, there are generally two repeats of the pattern in the width and 2 feet is the usual length for the repeat. In Brussels and Axminster the pattern should invariably be what is known as a "drop," but in Kidders it should be what is called a lift over or self match. In borders the repeat need not be the same as that of the fillings in length; 18 and 22½ inches are the usual widths.

In planning a design the artist should try to form a mental picture of what the effect will be when a large number of repeats are seen in diminishing perspective. Balance and distribution should be carefully studied, long straggling lines and angular forms should be avoided and stems should be broken and disguised by leading other stems in an opposite direction, or by throwing a spray of flowers across them. As a rule bilateral symmetry should be avoided. It frequently leads to great practical difficulties, as when narrow irregular corridors have to be arranged for. It will be found that a carpet which has a great deal of intricacy and mystery is more pleasing than one of which the whole scheme can be seen at a glance. In the drawing of the design this quality can be obtained by the use of a complex system of stem-work, not by any means necessarily an obtrusive structure, but one which will carry the eye hither and thither, and will not yield up the whole secret of its construction at the first glance. It can also be obtained by adroit management of colour, for instance by the use of different ground shades, that which forms the ground in one part becoming the figure in another, and so on; in fact there is no end to the complicated arrangements which are possible. A study of everyday commercial designs is the best means of mastering these. Whatever their artistic faults may be, some of them are marvels of ingenuity in this and other respects.

I can quite understand the feeling of repulsion with which our leading designers turn away from them, but I venture to suggest that they are sometimes worth study for their technical qualities, their arrangement, the way in which difficulties of drawing are got over.

MODERN ENGLISH PAINTING.

THE Spring Exhibition of the Royal Birmingham Society was inaugurated with an address by Mr. Harry Quilter. He said that he had been looking through the catalogue of the permanent collection of pictures at the Art Gallery, and it seemed to him that Birmingham had the best selection of pictures that he ever came across. Speaking generally, he did not think he could say as much, judging from the pictures that were illustrated, of any other town in England that he had been in. It was a very good thing not only to have fine things, but no rubbish. He then referred to some of the special characteristics of the exhibition—the collection of sketches and pictures by Pinwell and Mason—and pointed out that the poetic quality of Mason's work came about in a curious way. Mason painted for eight or ten years before he did anything worth looking at. By the mercy of God he lost all his money, and he was actually starving, when Costa took him into his study in Rome, gave him work, set him on his legs, and taught him his art. If they had ever seen Costa's work they would know whence Mason got the charm of his pictures. As to Pinwell, he (Mr. Quilter) had for the last nineteen years been the only man in England who had persistently written up that artist. He did not see how anyone could look on Pinwell's works without seeing that they were the productions of a man of great imagination, as well as of great technical power. Passing over the peculiarities of Pinwell's art, which he had dealt with in the catalogue that the Society had asked him to prepare, he said that during the last thirty years, roughly speaking, English art had gone through a large number of changes, and those changes had been so radical and, in his opinion, so unfortunate, that they had left English art in a state which he had hardly any words to describe. It was neither fish, flesh, fowl, nor good red herring. It was not English, French, or Italian; it did not belong to any special nationality, but it appeared to be swimming about here and there with a sort of vague desire to catch hold of something. Here it was impressionism, there it was colour, here again it was study in light and shade, and there a study of some ideal subject, such as the evening coming in at the window and finding a young girl dying over her sewing-machine. What they liked to do in the way of painting in the old days they did not like to do to-day. If they did like to do it they were told that they ought not to like. As a rule, being men not very much given to controversy, they held their tongues and did their work as well as they could. But the clique who were most vocal nowadays in the newspapers and clubs and societies were only great at one thing, and that was that they would not have old English art. Here was a strange state of things—on the one hand the experts declaring that old English landscape was conventional, false, ugly, untrue, and had every demerit one could possibly attribute to it; and, on the other hand, the men who ought to be the best judges of what was good, because they had their living to get by selling what was good work—the dealers—were paying increasing sums of money for these very same pictures. Were the people such silly idiots that they were going to increase their prices for what they did not care about? Why on earth should people try to paint France in England? When Englishmen painted France they did not do it at all well, because, being Englishmen, they painted it in a half-hearted manner. He was anxious not to run this art too hard, but he wanted them, as citizens who could exercise an appreciable influence on art, to think the matter out for themselves, and their duty was primarily to English artists. Therefore, even at the risk of being a little hard and discouraging, and perhaps causing pain to young students who had spent six weeks at the Beaux-Arts with the greatest satisfaction to themselves and their friends, who had learnt a flip-flap style of painting—even at the risk of discouraging young students, he asked his friends to press forward to establish English art in the counties of England if they could not do it in the Metropolis. It appeared to him that the Metropolis was too strong for them at the present time. They were collaring the Royal Academy, a thing he thought he should never live to see. There were hopeful signs, all the same, that this new expression of feeling was not going to last. He did not wish it to be understood that he was desirous of confining English art to one kind. He should like Englishmen to paint as many kinds and as many subjects as they liked, and in their own way; all he wished them to do was not to imitate the Frenchman. He did not want them to imitate anybody. What was nice about a picture was the expression of the artist's personality, and one could not express another man's personality, however much he tried. He could express an outside sense, a superficial resemblance; but what made a good picture beautiful was the thought that had been put into it by the artist himself, by his personal equation, if he might call it so. To imitate the personal equation of a nation was just as doomed to disaster as to imitate the personal equation of a man. He did not wish to draw the line at subjects which

in Miss Pinkerton's academy would be considered improper. If their artists wished to be improper, let them, but in an English way. The people were responsible for the art of the country. The artist would paint exactly what the people required. Let the artist see when he painted a trivial subject that did not please, and when he painted a subject in which he put all his art and mind let him see that he did please, even if he did not always rise to the height of the subject. To have a fine subject worthily treated made a finer picture than to have a trivial subject worthily treated. After all, art was a part of life. They might look at it from the side of commerce or from the side of art or literature. Their love to be worth anything must be made up in proportionate quantities of the various energies of mankind. Art should be a reflection of their lives, but not a reflection of the basest part. Let it touch the baser part if it liked now and then, but with a stern repressing hand. If they must have women's legs, do not let them put her in the brightest stocking they could conceive.

PETERBOROUGH CATHEDRAL.

THE appeal of the Dean of Peterborough for aid towards restoring the damage done by the recent storm to the west front of that cathedral has drawn the following remarks from Mr. William Morris:—

Everyone who has any interest in art or history must be much moved by this accident and wish for its speedy repair. I may add also that for some years past it has been known that this magnificent work of art, which is by common consent the noblest and most beautiful of our English west fronts, has shown signs of movement, probably due to some defect of the foundations caused by the draining of the fen-land, so that a thorough search into its present condition has been recognised to be necessary. I must say for my own part that an intimate acquaintance with the west front of Peterborough has made it so much a part of my life that I long to see it put out of all peril by judicious repair and essential strengthening of its structure, and I have no doubt that the Dean shares this feeling with me.

I heartily wish I could leave the matter here with a promise of what pecuniary aid I could afford, but there is another danger to which this great monument of English art is exposed besides that of falling into ruin. There are two ways in which it may be dealt with by its responsible guardians—the first would be the successful, the second the unsuccessful way. If treated successfully it will come out of this trial with its beauty intact, its external appearance unchanged from what we have known and admired in our lifetime. Unsuccessfully treated it will bear the appearance of a modern piece of work founded on an ancient design, and in that case it will have lost the greater part of its interest in the eyes of the historical student and the wide-minded artist; in short, it will have been "restored," and its genuine existence will have come to an end. That this is no chimerical danger is obvious from the fact admitted by almost all observers, that all our great architectural monuments have suffered more or less from the "restoration" mania during the last fifty years, and that some (e.g. Worcester and Lichfield Cathedrals, to go no further) have been almost destroyed by it.

I am well aware that the difficulties in the way of successful structural repair of Peterborough west front are, from the nature of the case, very great, that they are serious enough to tax heavily the skill and experience of the best masters of construction amongst us; but at the same time I am sure that they can be overcome by patience and the expenditure of a large sum of money. Only I think the occasion so important that the burden of undertaking the work should not be thrown on one man's shoulders, and that a consensus should be held of the best engineering and building skill before the critical part of the work is undertaken; though the preliminary work of supporting and shoring the threatened parts should be put in hand as soon as possible. And again I must say that if the front be taken down and rebuilt, instead of being made safe in its place—as I cannot see any reason to doubt it may be—the work will not be done, but undone, and a lasting shame will lie upon all who are responsible for the preservation of the fabric.

It would be a great relief, therefore, to all genuine lovers of the master art of architecture if we could receive an assurance from the Dean (1) that as little disturbance of the surface of the building shall take place as possible, and that consequently no merely decorative features shall be reproduced in imitation of the old work. (2) That every device which skill and knowledge can suggest shall be exhausted before rebuilding be even thought of, and that consequently a committee of consultation chosen from the best (not necessarily the best known) engineers and architects shall be called together to consult on the various devices for making the west front good. I think that the public have a right to ask the Dean for the fullest possible information of what is intended, to be done before they respond to his very reasonable and necessary appeal for funds. I cannot doubt that he will give that information readily and freely.

THE DURHAM EPISCOPAL CHAIR.

A FEW days ago, says the *Durham Chronicle*, whilst workmen were removing the debris which had accumulated on the floor of the chapter-house at Durham, they came across the seat and sides of the ancient stone chair in which the bishops of the see from Carleph to Barrington had been successively installed. It will be remembered that when the chapter-house was destroyed in 1796, that interesting relic of antiquity, the episcopal chair, was not thought worthy by the vandals of that period of preservation, and it was opined that it had been completely broken to pieces by the falling masonry. Hence the welcomeness of the discovery above recorded. An opinion was expressed that if further excavations were carried out the stone slab which formed the back of the chair and which is the only part missing would also be found. Whether this extra work will be undertaken we cannot say. But we believe a decision has already been arrived at to erect the episcopal chair in its original position in the chapter-house, and to utilise those portions recently discovered.

GENERAL.

The Judges appointed to consider the designs sent in for the Museum of Egyptian Antiquities have awarded the four prizes of 236*l.* each to MM. Bréasson, Loviot & Bernard, Guilhem & Gilet, and Drougnon. The prize of 104*l.* was won by M. Trouchy and Adrien Bey. There were eighty-seven competitors.

The *Conversazione* of the Society of Arts will be held in June in the Guildhall, by permission of the Corporation of London.

A New Grammar School is to be erected in Southampton by the Governors of King Edward VI. Grammar and Taunton's Trade Schools.

Mr. Frank Bowcher has designed the medal to be issued by the Corporation of the City of London in commemoration of the opening of the Tower Bridge.

The Gateway at Calais which was erected in 1635 is now being demolished. It was introduced in Hogarth's picture, and the artist was arrested for sketching it without authority.

A Model of the chapel of St. Peter Martyr, Milan, one-tenth full size, has been placed in the Dublin Museum of Science and Art.

Mr. J. Price Evans has been elected engineer and surveyor to the Wrexham Rural District Council out of forty applicants.

A Paper on "Architecture as a Craft" will be read at the meeting of the Liverpool Architectural Society on Monday next, by Mr. E. R. Taylor, of the Birmingham Art School.

The Count de Susor, chief architect of St. Petersburg, has been elected corresponding member of the French Académie des Beaux-Arts.

An Exhibition of Corot's works will be held in Paris in June, with the object of obtaining funds for the memorial of the painter, by Cros, which is to be erected in the Parc Monceau.

Mr. Joseph Farrow, of Marylebone, has received the appointment of highway surveyor of the Brigg district, Yorkshire.

The Abbé Duchesne, one of the professors of archæology in Paris, has received the appointment of director of the French School at Rome, in succession to M. Geoffroy.

The Ilkley District Council on Wednesday resolved that the whole of the designs submitted in competition for the proposed isolation hospital be discarded, in consequence of the plans not being satisfactory without rendering necessary considerable alteration and additional outlay; also that plans be prepared for a hospital to accommodate sixteen patients, and that such buildings as can be completed by an expenditure of 3,000*l.* be proceeded with after the sanction of the Local Government Board has been received.

A Fire which took place on February 17, destroyed the whole of the books, records and instruments belonging to Professor Milne, in Japan. The loss is irreparable, for there were documents containing the Professor's observations on earthquakes during a quarter of a century.

From a Revised List it appears that there are now on the books of the Institution of Civil Engineers 6,737 members of all classes, there being 17 honorary members (including five princes of the blood), 1,862 members, 3,687 associate members, 355 associates and 816 students.

Lord Savile has purchased and presented to the National Gallery a large picture by Velasquez representing *A Belshazzar*. The picture, which is a boldly-executed and masterly sketch rather than a finished work, was at one time the property of Sir Edwin Landseer.

The Architect.

THE WEEK.

THE situation of Mr. HINE, "sat on" by unfeeling predominant partners in his assessorship of the Portrane Asylum competition, must commend itself to any one with a sense of humour; but there is much else which can be enjoyed by all who love a joke. The majority of the assessors, when introducing the gratuitous and uncomplimentary, if not somewhat insolent, record into their report—of "regret that none of the competitors appeared to possess any experience of asylum planning"—hit with a sorer feeling than they reckoned at least four of the competitors, architects of repute not less than Mr. HINE or Mr. MITCHELL, and who have had much experience in asylum building, for they have carried out large works under the Irish Board of Control. These are Messrs. DEANE & SON, Mr. T. DREW, Mr. FULLER and Mr. PARRY. Now their schooling has been under officials of high rank in Ireland. The features in the designs of the above architects may be taken for the most part as the embodiment of official wisdom and experience of Irish official expertness, be it good or bad. With regard to the special usages of Irish asylums, something of resentment of the slight may be gathered in the marked compliments of the Irish officials in returning unsuccessful plans at such entire variance with the rude dictum of the assessors. What brought so uncalled-for and offensive a paragraph into the report at all has yet to be discovered. Irish architects, never backward in coming forward to give as good as they get when epithets are in the air, will probably have their own to say to the assessors when they get sight of the report. The "assessed" appear to have a good point to score against the assessors. There is no question that the conditions placed in the hands of both laid down that they were to be "regularly adhered to and enforced;" that the assessors were "to select from the designs sent in to any number not exceeding three which they consider of merit, placing them in order of merit." That the assessors did not discharge the last explicit duty (which the architects predominant together, should in duty to their professional brethren have insisted on) is a grave matter, capable perhaps of some explanation, but that Messrs. HINE and MITCHELL will find themselves at the tribunal of professional opinion on defence is to be expected. There is no question of the fact that one more large competition launched under most admirably fair conditions has turned out a fiasco.

It was announced at the last meeting of the Tunbridge Wells Town Council that the joint committees had settled on a central site at Mount Pleasant, between Monson Road and Lloyds Bank, for a technical institute, baths and other public buildings. There was no other site in Tunbridge which was so eligible for the contemplated municipal buildings. It has an area of about two acres, and will cost about 20,600*l*. The report was adopted with unanimity.

A PAPER on a remarkable ogham stone was read by the Earl of SOUTHBESK before the Scottish Society of Antiquaries on Monday. It was recently found in digging a grave in the churchyard of Abernethy, Perthshire. A few days after its discovery the stone was sent for inspection to the Museum of Antiquities, Edinburgh, where doubts arose as to the character of its inscriptions, which, if not fictitious, appeared to have been recently tampered with. In general character the inscriptions on the stone resemble no existing example. The stem-line is horizontal and as straight as if run with a ruler instead of being irregularly band-drawn and vertical, while nothing resembling the arcs on the line or the crown and bird above and below it occurs elsewhere. The letters are all vowels and the inscription yields no definite meaning, instead of embodying proper names in the manner of all other ogham epitaphs. The workmanship is suspicious, the lines being mere scratches, such as might be produced by an iron nail, and their freshness is so glaring that they cannot but be recent. The presence of moss on one edge of the stone shows that

that part of it must have been not long ago exposed to the air. Finally, the neatly-balanced arrangement, the affectation of novel ogham forms, the easy symbolism of the crown and the dove, and the triteness of the initial capital beneath the crown, were all suggestive of modern forgery. After having stated the arguments in favour of the inscription in similar detail, the Earl of SOUTHBESK pointed out that it bears no resemblance to any ogham relic in Ireland, England or Wales, its letter-forms being Pictavian, though its symbolism rather approximated to that of a mithraic, gnostic, or semi-Christian type.

LAND surveyors in England will rejoice if the proposal of Lieutenant-General E. F. CHAPMAN, for the undertaking of a geodetical survey of Africa, will be promoted by the forthcoming Geographical Congress. In a letter to the President of the Royal Geographical Society, he writes:—"My suggestions are that the congress should be invited to consider and bring to the notice of the various Governments concerned and to the geographical societies of the world the following subjects:—1. The advantages to be gained from an economic as well as from a scientific point of view of extending geodetic surveys in the settled portions of Africa. 2. The importance in districts beyond the probable range of geodetic surveys for the next few years of making surveys of areas rather than of routes; and the advisability of basing such surveys on rapid theodolite triangulations wherever it is practicable to do so. 3. The desirability of collecting a complete record, as regards Africa, of all the positions that have been accurately fixed astronomically in areas that have not been triangulated, and of combining measures for the purpose of determining new positions, taking care that, in the case of all future observations, full data should be published so as to enable the geographical world to appraise them at their proper value." Unless the European countries who have taken possession of Africa will unite for the purpose, it is not likely that a general survey is ever likely to be executed.

THE French Government have presented Mr. LOUIS H. SULLIVAN, of Chicago, gold, silver and bronze medals in acknowledgment of his gift of a collection of models of architectural decorative ornaments to the National Musée des Arts Décoratifs in Paris. According to the *Inland Architect*, the notification from the director of the "Centrale Union des Arts Décoratifs," of Paris, informed Mr. SULLIVAN in terms most complimentary that the medals were designed and made especially for him, as a proper acknowledgment of his courtesy in making the gift. They were also intended as a tribute to the beauty and artistic merit of the art models. The specimens of Mr. SULLIVAN's work include a large number of casts of ornaments which adorned the Transportation building at the World's Fair, replicas in bronze of the doors of the Wainwright memorial in Bellefontaine cemetery, St. Louis, and the door of the Getty tomb in Graceland cemetery, Chicago. During the World's Fair the art commissioners of France were particularly impressed with Mr. SULLIVAN's work. Recognising the artistic merit in the decoration of the Transportation building, the classic lines of the models of the tombs, and the delicate spirit displayed in their ornamentation, the official request was made at the close of the fair for a loan of models of all to the museum in Paris. Mr. SULLIVAN presented the models to the commissioners. They were not only promptly accepted and the especial medals voted to the donor, but a further graceful acknowledgment of the gift was the naming of the section in which the models have been placed "The Louis H. Sullivan Section." In the official letter which informed Mr. SULLIVAN of the shipment of the medals there was also enclosed a request from the director of the Russian School of Applied Arts at Moscow, for the particular privilege of reproducing the models for use in the school. Accompanying the request was also one from the French commissioner, desiring Mr. SULLIVAN to make his permission sufficiently general to allow other art schools in Europe the same privilege. This request was made, stated the commissioner later, as the models had, during their few months' exhibition in Paris, excited so much admiring comment among artists that other art schools on the Continent were almost certain to repeat the request of the Russians.

CLAUDE LORRAINE.

IN the year 1600 CLAUDE GELLÉE was born at Chamagne, in Lorraine. He thus appeared among men just six years before JOHN MILTON. The affinity between the two was evidently in REYNOLDS's thoughts when he said, "A landscape conducted under the influence of a poetical mind will have the same superiority over the more ordinary and common views as MILTON's 'Allegro' and 'Penseroso' have over a cold prosaic narration or description." The poet and the painter were alike fascinated by the sun, and rejoiced in watching its effects. If any English noble wished to have a picture that would express in form and colour

the eastern gate
Where the great sun begins his state
Rob'd in flames, and amber light,

there was only one hand in all Europe, in the seventeenth century, that was competent for the task, viz. the sickly Lorrainer's. In the early part of the seventeenth century landscape art was only in its infancy. It was derived from the theatrical scenery which BALTHAZAR PERUZZI, the architect, employed to enhance the attraction of "La Calandra" when it was represented before LEO X. The art had advanced between that time and CLAUDE's appearance in Rome. But there was no attempt to express the effects of the "bright effluence of bright essence increate" in giving animation to land and water, until he tried. The landscape backgrounds, like the historical landscapes of the earlier time, had excellent qualities, but as they were deficient in that contrast which comes from the operation of light and which alone could give them animation, they could not adequately suggest what MILTON calls "day, or the sweet approach of even and morn." The introduction of APOLLO in his chariot in the upper part of a picture was a sorry substitute for the sun, and an academic laying out of light and shade in definite proportions across a view could not atone for the absence of that vivid luminousness which can have only one source.

CLAUDE, by his innovations, enriched the world, but it cannot be said that of late years artists are much given to the acknowledgment of their debt to him. Nor is that circumstance surprising. Since his time nature has been studied with a scrutiny that is almost microscopic. Artists have not been able by their studies to gain more knowledge of men and animals than was possessed by the Greeks. But with that form of nature which is classed as landscape, an exactitude of knowledge has been acquired which would amaze not only CLAUDE and his successors, but the Greeks in their best days. It is expressed by the one word detail; not merely in the pre-Raphaelite or photographic sense of presenting everything that exists in a scene, but by a correspondence between all parts, however uncommon may be the circumstances, and which can only be attained by constant and loving watchfulness of phenomena. In REYNOLDS's day, although landscape art was not popular and patrons were willing to accept a conventional treatment, the new spirit was making itself felt, to his own uneasiness. It becomes evident when we hear him saying, "Whether landscape-painting has a right to aspire so far as to reject what the painters call accidents of nature is not easy to determine. It is certain CLAUDE LORRAINE seldom, if ever, availed himself of those accidents; either he thought that such peculiarities were contrary to that style of general nature which he professed, or that it would catch the attention too strongly, and destroy that quietness and repose which he thought necessary to that kind of painting." The change of style is indicated when we find CLAUDE's countrymen waited until the present time before they proposed to erect a statue of him in any public place.

In England it is excusable if we are indifferent, and it may surprise many to find that a biography of the landscapist had been added to the "Portfolio" Series ("Claude Lorraine," by GEORGE GRAHAME, London: SEELEY & Co., Limited). Our TURNER is supposed to have surpassed the Franco-Roman artist. That was one of the results of Mr. RUSKIN's eloquence and polemic skill. TURNER's injunction that two of his landscapes should be hung side by side with CLAUDE's was evidence of his belief in the power of his advocate and his confidence in the judgment of his countrymen. It is well, however, to remember

that Mr. RUSKIN, with all his enthusiasm for TURNER, has to acknowledge that CLAUDE is not deficient in good qualities. He testifies to CLAUDE's feeling for beauty and form, his tenderness of perception, his unequalled aerial effects, his sincerity of purpose, his endeavour to be true so far as he felt the truth, and his pains to represent waves and skies as he saw them. But more exactness was needed, owing to the influence of science, and Mr. RUSKIN is right when he says, "large admiration of CLAUDE is wholly impossible in any period of national vigour in art." CLAUDE was a revealer, a seer, and we must not quarrel with him if some who came after him were endowed with keener vision. GOETHE, who was always free from being led away by partiality for a favourite artist, determined the position of the landscapist when he said to ECKERMANN, "CLAUDE LORRAINE knew the real world thoroughly, even to its smallest detail, and he made use of it as a means to express the world contained in his own beautiful soul. He stands to nature in a double relation: he is both her slave and her master; her slave by the material means which he is obliged to employ to make himself understood, her master because he subordinates these material means to a well-reasoned inspiration to which he makes them serve as instruments."

The life of CLAUDE is one of the most attractive in the whole range of the biographies of artists. CARLYLE, who was contemptuous towards art and artists, makes an exception in his favour. "Whose taste in painting," he asks, "is truer and finer than CLAUDE LORRAINE's? and was he not a poor colour-grinder, outwardly the meanest of menials." It was CLAUDE's fate, before he attained the colour-grinding stage to have passed through many vicissitudes. His parents were so poor they were unable to keep him at school for more than a brief period, and it is supposed that he was bound apprentice to a baker. He was an orphan in his twelfth year. Evidently he must have suffered misery in the bakehouse, for, although he was the least enterprising of mortals, he ran away to Fribourg in Brisgau, where an elder brother was occupied in wood-cutting. From him young CLAUDE received some instruction in drawing. After some months he followed a relative who dealt in lace to Rome. Nobody wanted him in Rome, and he turned towards Naples. There he was fortunate in obtaining employment of a humble kind with GOTT-FRIED WAELS or WALSH, in whose painting-room he was initiated into the mysteries of colour-grinding.

It has been ascertained he was back in Rome in 1619, and served as a humble factotum with AGOSTINO TASSI. The master was one of those swaggering fellows who so often appear in the history of Italian art. He had studied under PAUL BRIL, the Fleming, but in his early manhood his career might appear to be marred, for he was sentenced to ten years at the galleys. On his release he worked for other painters, and eventually won the favour of the Pope. He was expert in a sort of decorative work, in which he utilised perspective, and his experience on board a galley enabled him to paint seascapes more effectually than was common. TASSI seems to have commiserated the delicate CLAUDE, and he made a competent painter of his assistant. How long they remained together is not to be discovered. CLAUDE, about 1625, appears to have left Rome and travelled in a roundabout way to Lorraine. Nancy was the capital of the dukedom. It did not then display the marvellous collection of ironwork which now adorns almost every street. But it possessed fine Mediæval and Renaissance buildings. CLAUDE was engaged by DERUET, who had a monopoly of the most important works of decoration, and was employed on the ornament of a Carmelite church, which is now destroyed. He was too restless to remain in Nancy, and in 1627 he is found again in Rome.

The landscape decorations which were then common on the walls of salons afforded him employment. Probably he imitated TASSI's work, in which at an earlier time he was allowed to co-operate; but that sort of conventional treatment did not satisfy him. SANDRART, who professes to have been well acquainted with CLAUDE, gives us a glimpse of the early studies by which he prepared himself for nobler work than decoration. He says that CLAUDE used to spend whole days in the Campagna recording phenomena, and from the sketches he composed his

pictures. His spare hours were occupied in drawing from the life, or from sculpture at the Academy. He never was very successful as a figure-painter, but few landscapists were better able to utilise imperfect figures for positions in foregrounds. In his *Village Dance*, which is in the Louvre, he must have employed one of the Dutch painters to fill in groups; but, with all the merits of the figures, we doubt if they are more satisfactory than CLAUDE's own puppets. Whatever may be his success in representing landscapes, there never was a man who was more absorbed by art. In his concentration he can be compared to MICHEL ANGELO.

Whether patrons were drawn towards him suddenly or by slow degrees is unknown. He is supposed to have gained a name before 1635, and the favour he then secured was constant for nearly half a century. CLAUDE was one of the few painters who met with the reward which their labours and talents merited. His countrymen were among the earliest to recognise his powers. This is evident from the pictures by CLAUDE which are in the Louvre. The *View of a Harbour by Sunrise* and the *View of the Campo Vaccino* were painted for DE BETHUNE, who was French ambassador in Rome. *A Village Fête*, *A Harbour at Sunset*, *The Landing of Cleopatra* and *The Consecration of David*, *The Ulysses* and *The Harbour Scene* all belonged to LOUIS XIV. Some pictures were painted for Pope URBAN VIII. He received an order from England as early as 1644, and from various parts of Europe commissions were sent to him.

His pictures can be traced partly by the help of records and partly by his *Libri Veritatis*, but the artist himself remains for us unknown. Apparently he lived alone, as is usually the case with giants, but it seems incredible that at a time when so many strangers were attracted to Rome, and when so many competent writers lived there, not one of them has described for the benefit of a future age the man himself or his surroundings. Even his will throws no light upon his life. The only legatee was a nephew, whose services he acknowledged by bequests. Most of his property went to a child called AGNES, who was brought up in his house out of charity. He could not be his own biographer, for he did not possess sufficient knowledge of any language to write at ease. Under the circumstances it is hardly possible to supply more information about CLAUDE than appears in Mr. GRAHAME's sketch.

Critics have found fault with CLAUDE for the prominence which is given to buildings in his paintings. We should remember that CLAUDE lived in a city which was remarkable for its architecture, and during many of the years in which he resided in Rome buildings were in progress. He could hardly escape their influence. He must also have perceived that for expressing the effect of light he could find no masses more serviceable than buildings. In modern times more delicate effects can be produced by the aid of trees, but CLAUDE was a pioneer, and he prepared the way which later artists have followed. The rigid lines of buildings were also admirable foils to the natural objects he painted. Finally, it should not be forgotten that CLAUDE was a solitary, and during a large part of his life an invalid. To him a natural scene from which man and his works were absent was not a pleasing sight. Like many great artists, he testified to the importance of architecture, and for his reverence to the art he deserves our admiration.

PAINTINGS IN CHURCHES.

THE earlier Christian converts being Jews carried with them all those prejudices against the representation of life so rigidly guarded against by their law, as well as by the often-denounced practice of the pagan nations by which they were surrounded. Their zeal, indeed, against the arts so extensively used in the heathen temples may be learnt from the strong invention of their apologists. They even carried their enmity against the artists themselves, excluding them from their communion, if as converts they continued to practise the hated profession and denying the rite of baptism to those candidates for admission unless they renounced it. As they obtained more power and influence, we have instances of fanatical rage similar to that of the Puritan of a later time, and perhaps the progress of Christianity more than any other abuse hastened the downfall of the already declining art of antiquity. But it is evident that the accession of heathen converts to their communion must gradually have weakened

this prejudice, and it was from among them that the practice first obtained.

The first public notice that we find taken of paintings in churches is among the canons of a provincial council held at Illiberis, now the city of Elvira, in Spain. The precise date of this assembly is unknown, but it was near the close of the third century. The words of the canon by which the practice is unreservedly condemned are emphatic and precise. It says:—"It is decreed that pictures in churches ought not to be, neither may what is worshipped or adored be painted on the walls." This condemnation of itself argues a somewhat extensive application of a principle; but it should be observed that in this sentence we must not recognise the voice of the Church, for it is certain that it never received universal attention, and in all probability its influence was not felt beyond the province in which the council was assembled.

The first indications of a yearning towards representation in the Christian society was evidenced by the use of symbolic forms—such, for instance, as the fish, the lyre, the dove, the lamb, the vine, the palm, the ship, the anchor; to which may be noticed the cross, as probably the earliest of all, and the monogram of the holy name.

It is in the catacombs of Rome—places consecrated so early to Christian worship, through the dangers to which its early professors were exposed—that we meet with the earliest examples of the use of painting in the new religion. These are very evidently the productions of converts from the heathen, as they so closely resemble in style and character the previous pagan decorations. Indeed, this resemblance is so remarkable that it requires a very narrow examination of the subjects to distinguish the one from the other. It is also observable that the selection of subjects betrays extreme caution and reserve; those having an indirect allusion to the doctrines of Christianity, by way of antitype, being at all times preferred. Of these, the most frequent was the story of the prophet Jonah, which was generally told in four compartments: the first shows a naked figure of the prophet reclining beneath a frame on which the gourds are trained; the second shows the mariner casting him into the sea, and it must here be remarked that the idea of the whale is curiously expressed by an animal resembling the sea-horse of classic antiquity; the third, the monster casting him upon land; and the fourth represents him seated.

A selection of miracles from the Old Testament was also of frequent occurrence, arranged together thus:—Noah receiving the dove returning with the olive-branch, Moses striking the rock, the manna in the wilderness, Abraham about to offer up his son Isaac, and a few others. Of subjects from the New Testament, though rarer, many were particularly selected, such as the paralytic carrying his bed, the raising of Lazarus, restoring the blind to sight, &c. The manner of treating these subjects was peculiar, and exhibited a symbolic tendency. The introduction of the figure of the Saviour is rare, unless it be under the form of the good shepherd carrying on his shoulders a lamb strayed from the flock, but there is no attempt at any peculiar elevation of character. Another popular subject belongs to this period of Christian art, and this only; it is that of Orpheus playing on the lyre, plainly taken from Pagan art, although there was a strong inclination to give to the Orphic hymns a prophetic character. The earliest design in which the Virgin and Child are introduced is in the catacomb of St. Calistus, pope, on the Appian Way; this is the adoration of the Magi, who are all represented in the Phrygian cap.

One of the earliest descriptions of the decoration of a Christian church that has come down to us is found in one of the epistles of Paulinus, bishop of Nola, who flourished at the latter half of the fourth century, the contemporary of Saints Augustine and Jerome. Paulinus was a native of Aquila, of senatorial rank and of great wealth. He became a convert to Christianity and was exceedingly zealous in his new faith, in proof of which he constructed a magnificent church near Nola, in honour of St. Felix the martyr, of which he has given a very interesting and minute description both of the arrangement and of the nature of its decorations. Among other things he describes the paintings introduced on the walls and vaulting, all of which appear to have been selected from the Old Testament. Then he continues to enumerate and descant on the several subjects, from which it appears that it contained the story of Moses, the passage of Jordan, the story of Ruth and Orpah, and, arranged on walls opposite to each other, the temptation of Job, the stories of Tobit, Judith and Esther. We also learn from him that the custom of affixing descriptive legends or texts illustrative of the subjects had already obtained, for he says, "alluding to the subject which is expressed above by titles, that the letter may show what the hand has explained." He concludes by asking his friend if by chance he should require some reason for this new practice of painting the sacred houses, he will show it in a few words. He then goes on to say that the place was frequented by a rustic crowd not learned in reading, for whose edification it was intended; and that such had been the effect that, "behold, frequent vigils extend through the whole night."

In the fourth century the arts were rapidly declining, but if we could place confidence in descriptions we might yet imagine a power existing of no mean character. Among the records of the second Council of Nice there is an account of a painting of the *Martyrdom of St. Euphemia*, given by Arterius, bishop of Amasia, belonging to this era, in which the diversities of expression are particularly noted and described, and the highest encomiums are bestowed upon the painter, not, indeed, undeservedly if his work answered the description. "Greatly I admire," says he, "the painter who modesty and manliness could so combine;" and in another part he bears testimony to the faithful and expressive colouring thus:—"For so manifestly and evidently the painter has coloured the drops of blood that you might swear it flowed from the lips, and with weeping you are compelled to depart." In this country there can be no doubt that painting was introduced with Christianity itself by the missionary St. Augustine, as Pope Gregory the Great said it was chiefly for the sake of the heathen, instead of reading, that they might learn from them what they ought to worship. Thus, in the seventh century, we find two eminent men, St. Wilfrid and Benedict Biscop, both employing the arts extensively in the service of religion. Bede gives an account of the latter bringing paintings from Rome to adorn his church at Wearmouth. The images of the Virgin Mary and twelve apostles were disposed on the roof at the east end, carried from wall to wall, arranged apparently in tablets or panels, for they were doubtless executed on wood and in distemper. Subjects of Gospel history were disposed on the south wall, the visions of the Apocalypse of St. John on the north. A similar testimony, drawn from the same authority, is given by Gregory Nazianzen, who said he could not contemplate a picture of Abraham about to offer up his son without shedding tears. We must, however, accept these testimonies with some reserve, for at a later time, when the arts were in the lowest state of degradation, it is not uncommon to meet with similar encomiums. There can be no doubt, then, that the close of the century saw the principles of decorating churches with paintings established far and wide wherever Christianity was to be found, and it seems to have gone on silently without encountering any opposition, except, perhaps, from small communions of heretics.

That abuses, however, had crept in very early we have the testimony of St. Augustine, who says that he knew many who were adorers of pictures and sculptures, but it was not until the eighth century that an attempt was made to suppress the practice. This, however, was attempted by the Emperor Leo, known thence as the Iconoclast. By him religious pictures were proscribed in the churches of Constantinople and the provinces; they were, by his edict, defaced and covered with a smooth surface of plaster; but so greatly were the popular feelings outraged by these proceedings, that civil war, embittered by theological controversy, raged throughout the Roman empire for upwards of a century. To settle the question, his son and successor, Constantine, called a council of the Church at Constantinople, A.D. 754, which pronounced a unanimous decree that all visible symbols of Christ, except in the Eucharist, were blasphemous, and that all such monuments of idolatry should be destroyed. Notwithstanding, however, the vigorous persecution of those who fondly clung to a practice to which they had been so long accustomed, this decree was found impossible to be enforced. The second Council of Nice, which took place in 787, finally settled the question as regards the Church, and produced a very permanent effect on the practice of church decoration. The records of its proceedings contain a vast deal of information relative to the doctrine of the Church on the subject. It asserted, contrary to historic truth, the continuous use of pictures from the time of the apostles; but its decrees respecting the relation of art to the Church were the most important, because of the extraordinary influence that they had in reducing art to a mere convention dependent on the theologian. The council decreed that the structure of images was not the invention of the painter, but the approved legislation and tradition of the Church; and in another place it says, "the art alone is the painter's, but the ordination and disposition the holy father's." The consequence was that from that time art lost its mental activity and remained stationary for centuries, and in the Greek Church to this day it affords a most singular phenomenon of the repetition of the same forms handed down from one generation to another, so much so that MM. Didron and Durand, the French antiquaries, remarked in a tour in Greece in 1838 that the resemblance between works executed at St. Mark's in Venice by Greek, or as they are better known Byzantine, artists in the tenth century was complete, even to the number of folds in the drapery, to works many centuries subsequent; as doubtless it was the monasteries of Mount Athos that furnished with designs the artists who, from the seventh to the twelfth centuries, filled the churches with their productions. The influence of Byzantine art was felt throughout Europe for many centuries. Their art,

founded upon the decrees of the Council of Nice, remained, as before observed, a fixed type without improvement, possessing but a limited mechanical power and still less feeling for nature.

The freer spirit of the West naturally operated very powerfully in destroying this domination which fettered the hand of the artist; for although convention can be observed even to the end of the fourteenth century, yet there were many departures from its influence. It is exceedingly curious to note this feature in Mediaeval religious art, which we have many opportunities of observing throughout the twelfth, thirteenth and fourteenth centuries, whether seen in MSS., sculpture, or paintings on the walls of churches; even in the technical delineation of form, down to the middle of the last-mentioned period, there seems to have been a fixed rule. This may be partially noticed in the mode of drawing the features, which certainly for a whole century does not materially differ.

After the decision of the Council of Nice no serious opposition was made to pictures in churches, and there can hardly be a doubt but that every church had some kind of religious painting on its walls.

In the twelfth century, when so great an impulse was given to the arts, we find the voice of the eloquent St. Bernard raised against those strange combinations of forms painted on the walls of churches; monstrous centaurs, half men, spotted tigers; and he continues, "you see under one head many bodies, and again in one body many heads. Here is discovered the tail of a serpent on a quadruped," &c.; and he observes, the whole day is occupied in admiring these things, rather than in meditating on the law of God. The grotesque figures common in Norman work are similar to those alluded to by this father.

The improvement and advance in architecture in the twelfth and thirteenth centuries was accompanied by a corresponding progress in the art of painting and design, and our parochial as well as our cathedral churches received as much decoration as expense and circumstances permitted; and thus it continued until the sixteenth century, when one of the earliest acts of the Reformation in this country was the condemnation of paintings in churches; at this period they were covered with whitewash and defaced, and their places supplied with texts of scripture.

EDINBURGH ARCHITECTURAL ASSOCIATION.

AT the last meeting of this Association, Mr. W. W. Robertson, president, in the chair, Mr. John Kinross, A.R.S.A., gave an address on St. Andrew's Priory, in which he dealt in the first instance with the history of the buildings, and proceeded afterwards to describe in detail the excavations which Lord Bute had undertaken in connection with the ruins. He gave it as his opinion that the evidence was amply sufficient to prove that the monastic buildings were commenced after the cathedral building was completed. A large ground plan, which was exhibited, showed the extent of the information regarding the dimensions and the site of the ancient buildings brought to light in the course of the excavations. Mr. Thomas Bonnar read a paper on "Some Notes on Ancient Mural Decorative Art in Scotland." Dividing the subject into two divisions—the ecclesiastical and the secular periods—he said of the first that, owing to the ravages which left the ancient religious edifices of our country in a totally ruinous condition, there were only two examples known to him of ecclesiastical coloured work illustrating this phase of art in Scotland. The more important specimen was the groined roof of the crypt of Glasgow Cathedral. That remarkable and highly interesting piece of decorative work, although in a decayed condition, showed by its presence on the roof of that ancient structure, which dated back to the twelfth century, that the interiors of religious houses were highly decorated with ornamental forms, and that the use of rich colouring was prevalent in those early days of the Church in Scotland. From its character, composition and colour it was typical of the predominant conception which ecclesiastical authority adopted for the internal embellishment of the cathedrals and churches under the dominion of the Pope at that era. The mullions that formed the groined arches of the roof were deeply moulded and filled in with full colouring of red, yellow and white. The centre bosses were also tinted with similar colours, and there was evidence that the enriched carvings had been overlaid with gold. At the intersections of the groins and at the bases of the arches there were painted on the plastered stone arches richly twining ornamental scrolls representing conventional foliage, the prevailing tint being green. The drawing of the ornament exhibited great precision, while it retained much spirit in the flow of its lines, proclaiming it to be the work of a proficient artist. These particulars were noted many years ago, but he was surprised and disappointed to find on a recent visit that not one vestige of the ancient work now remained. So thoroughly had it been obliterated that it was evident that the chisel had been employed to accomplish it—the worst act of vandalism of recent times.

The other proof of colour being introduced on stonework was to be seen in Dryburgh Abbey within the chapel adjoining the one where lies the greatest of the romancists, Sir Walter Scott. Though but a humble example, it served to show that such treatment of the stonework with colour was considered requisite for the full effect of the Church ritual in that remote period. Looking at these examples, they were justified in believing that the art of those early days must have been of an elevated and sincere kind. By way of comparison, specimens of contemporary decorative work in England were described, and a brief sketch of the rise of the art was given. Turning to the secular part of the subject, he said they were in the more fortunate position of having fairer representative examples to illustrate the condition of domestic interior coloured decoration previous to the Reformation period, although, owing to the absolute and discreditable neglect they had been subjected to, they had no doubt lost many specimens of mural decorative gems from the ceilings and walls of their ancient castles and mansions. It was impossible to determine the probable date when this class of work was first used for interior decoration. The earliest dated ceiling extant was the Nunraw one, the year inscribed on which was 1461. Borthwick Castle, which dated from 1430, with its handsome hall and stone arched roof—the surface of which was plastered over at the present time—showed traces of both design and colour having been carried out on a most elaborate scale. Its treatment and motive bore some resemblance to the timber roof of the church of Largs, which dated from 1636. In depicting the family escutcheons on these ceilings, which had now become historical, the artists had clothed them in floriated compositions of grotesque masks and quaint ornamental forms drawn in freehand, and throughout the composition a satirical humour underlay the motive. On the coats-of-arms, which were the main feature of the schemes, were painted the quarterings of many of our leading families, the medium employed being distemper. To the initiated the story suggested by the character of the heraldry thus represented was that of thrilling scenes of embroilment and tragedy, and happily also of peace and harmony, enacted within the walls that enclosed them. It was with a feeling of pride that they laid claim to this as a native type of decorative art, for with little difficulty he had arrived at the conclusion that the workmanship was that of his own countrymen. The characteristics of the art were Scottish, and though the work of foreign artists might be observable, still they could recognise the individuality of native artists in the architecture of Falkland Palace, Linlithgow Palace and Stirling Castle. The now empty niches above the grand gateway in the eastern side of the quadrangle of Linlithgow Palace were once occupied by statues of a pope to represent the Church, a knight to indicate the gentry and a working man to symbolise the commons, each having a scroll above his head, on which were inscribed a few words of legend now irretrievably lost. That was gathered from the records of 1535, which further showed that these statues, together with the group of the Salutation of the Virgin upon the other side of the quadrangle, and certain unicorns and a lion upon the outer gateway, were brilliantly painted. Reference was made to three ceilings—namely, that in the chapel of Falkland Palace and two in Holyrood Palace—which were decorated in the heraldic style, evidently of English origin, and were probably the work of the Court official known by the name of the “Sergeant Painter”—to indicate what was recognisable as not being the work of Scotsmen, and so enable them to include the remaining specimens as purely national. There was a growing opinion in some quarters favourable to the renewal of this mode of painting, and those impressed with the idea of introducing such an attractive style of decoration into our ecclesiastic, civic and domestic buildings should keep in view that the character of the design should especially bear the impress of a native type.

GLASGOW SCHOOL OF ART.

IN his seventh lecture of the series on “Mediæval Architecture,” Mr. Alexander M’Gibbon discussed the Perpendicular style. This style had the longest life of any, and hence the numerous examples extant, though none are of the first importance in scale. Their survival may largely be attributed to the fact that no subsequent style has intruded, as Perpendicular itself had, upon existing work. The artistic motive in the new style was possibly a more self-conscious one than that attending previous developments. There was a desire for a superior beauty; before architecture had rather expressed the Church’s power. Whatever the merits of the style, it was quite an indigenous growth—the first and only real English Gothic. The vigour of the national life of the period should commend to us its architecture, but instead there is prevalent an unaccountable disparagement of both. How original Perpendicular may be realised by a comparison with French Flamboyant, that appears as the natural and inevitable develop-

ment of Decorated; while Perpendicular shows in many points a quite unconscious recurrence to earlier principles. Thus, the more stone-like treatment of bar tracery that was in effect plate, but with a greater depth than Norman E. E. ever had; fan vaulting in which extremes met, for when the ribs became most numerous in reality it was the vault surface that again, as in Romanesque, was the constructive necessity; the depressed arch, that was an invention artistically only less valuable than the Pointed, for if the earlier form permitted of a greater height than the semicircular semicircle, without the objectionable stilt, so the latter made possible a lesser height by other means than the equally unsatisfactory segmental arch. The flat roof, too, was again of the pitch best suited for its lead covering and alike internal and external appearance was expressed by the gable. Even the all-prevalent panelling may be defended as decoration of the wall proper—Mr. Ruskin’s “veil”—in more architectural fashion than mere rustication, however elaborate; for it can hardly be questioned that the wall is as worthy of embellishment as the fenestration that in Renaissance was the principal field of display; while in Roman practice there was an imposition of an order that ignored both wall and window. The lacking feature in the style was the column. Previously it had been minimised to the engaged shaft; but now even that was frequently dispensed with, and arch moulds were continued to the ground. To persist in denying ourselves the use and enjoyment of this chief of architectural features is to provincialise the style, so in any revival of Perpendicular the column should certainly be reinstated; and to do this in style will provide scope for legitimate originality. In the closing lecture, the first part was occupied with a review of late Scottish Decorated, principally of the sixteenth and first half of the succeeding century; of earlier work the nave piers of Dunkeld Cathedral, that show the columns retained, were commended as suggestive. At the very close of the fifteenth century, in the crown towers of St. Giles and King’s College Chapel, Aberdeen, appears the most distinctive feature that Scottish Gothic can boast. Her Decorated had more affinity with French Flamboyant than with English Perpendicular, and the cause that prevented the latter crossing the Border seems to have been the decline in the Church’s influence, with the rise in social condition of the worker. The Church was still the chief patron of architecture, but the designer no longer followed, as matter of course, the fashion of the south. The Scoto-French political alliance of the times sufficiently accounts for the Renaissance influence seen in baronial buildings of the period; still, it is remarkable how that style should percolate down to the humblest strata of buildings, and become, in time, the vernacular expression of taste, to the complete abandonment of every trace of Gothic tradition and practice. The review of Mediæval architecture completed, a short notice of Mediæval builders was given. The “master-mason” was seen to be the functionary most nearly approximating to the modern architect, an office that dates from the Conquest, and one generally filled by a layman. Too often architectural credit has gone to bishop and abbot, for the title “surveyor” and “supervisor,” frequently held by prelates, might better be expressed by the word steward; they were cultured and munificent patrons of architecture, but only very rarely indeed actual designers. The limited variety in building and the almost constant type of church plan—since that masonry and, later, carpentry were the crafts directed by the “master-mason”—show that his duties were by no means so multifarious as are those of his successor. The influence of the Freemason is now regarded as much less potent, even in the latest years, than was once imagined. Geometric proportion and numerical ratios in building, if ever generally employed—which is very doubtful—have been so on a principle whose secret is now lost. Ingenious arrangements of triangles may be applied to sections, but we are hardly convinced that their rationale is understood. Mediæval mouldings, too, can hardly be thought of as most logical elaborations of profile to best insure subtle shadow when on north and south frontages they appear alike. True, this applies to Classic as well; but it is only of Gothic that this contention appears of its superiority in the philosophy of mouldings.

At the conclusion of the lecture Mr. T. L. Watson, on the behalf of the governors of the school, expressed gratification of the interest and attendance the course had attracted. Its justification, however, did not lie altogether in monetary success; architecture as an art of first importance claimed the best attention of a school of art, and in this and the preceding course there had been given information, historical and critical, complementary to that practical acquaintance to be gained by study of actual examples in the classroom and by design.

The Plebiscite Voting by the public in regard of the pictures shown by the Glasgow Institute of Fine Arts has resulted in a declaration that No. 191, *A Girl in White*, by John Lavery, A.R.S.A., is the finest portrait in the present exhibition.

TESSERÆ.

Paul Veronese.

IT is no unfair mode of rating the qualities of art to estimate them by the difficulty of their attainment, and the rarity with which we find them in any tolerable degree of perfection. A poet may, in a word or two convey an idea of the complexion of a beautiful woman, and those words often very vaguely used. In the hands of Shakespeare, "Nature's pure red and white" are sufficient; but the painter, to do this, must engage in an actual rivalry with nature herself—a contest in which a distant approach to her is allowed to constitute success. And even such success, in the colour of flesh, has not perhaps been accomplished by twenty artists with whose works we are acquainted—Paul Veronese being one. It must be acknowledged, however, that no painter has less of sentiment or strong expression; but, at the same time, he has never anything of affected sentiment, of which there is so much in art, and which is infinitely worse than none, and the expression we do find in his works is always true to nature. In the picture of *Esther before Ahasuerus* in the Louvre, the whole figure and the face of the fainting queen are admirable. The death-like paleness is exquisitely given, the half-open eyes that see nothing, and the slightly parted lips. She has not fallen, but remains a lifeless weight in the arms of her attendants. But Paul Veronese is seen to great advantage in the Louvre, especially in his two immense works, *The Marriage at Cana* and *the Magdalene Washing the Feet of our Saviour*. *The Marriage at Cana*, it is true, is anything but a relation of the story. But its great merit is that it exceeds all other pictures of its size in noonday splendour of colour and breadth of effect, and it need scarcely be remarked that it is in such pictures, containing an infinite variety of minute parts, that breadth is most difficult of attainment. But in the other picture, though it has suffered much by time and reparation, the same excellences are united with much propriety of treatment and of expression. Paul has imagined the incident to take place, as related by St. Luke, in the house of a Pharisee; and the magnificent architecture might not, therefore, be inappropriate, nor is the violation of the costume so flagrant as in many of his other works. He has given to Judas, who may be known by the purse at his girdle, the meanest head in the picture, but with nothing of the look of a downright villain, and this is perhaps the truest physiognomy of the character. The Magdalene is well conceived—wholly absorbed, unmindful of all about her and what is said, her heart goes with her action. The expression and interest with which a young man, perhaps intended for St. John, regards her devotion, is inimitably natural, and the conception of the whole picture has great dramatic truth; the main incident entirely absorbing the attention of all who, from their situation, are aware of it, while the personages near the right and left extremities of the canvas, ignorant of what is going on, are otherwise engaged. This picture does not rank with or even near the conceptions of Raphael, but it shows that the merits of Paul Veronese are very far beyond the mere verbiage of art.

French Renaissance.

A study of the architecture of the work of Francis I. at Blois clearly shows that the French builders accepted, not the conventional restrictions of the classic formulas, but their essential spirit as an organised scheme of ornament. They did not care for the antique traditions because of the association of these traditions with the greatest triumphs of the race, for they had not yet become scholars; but they were glad to use in their own buoyant way the pilasters, panels and ornaments, the pediments, consoles and architraves which were a part of these traditions, and which enabled them to give free expression to their new emotions. They took up the decorative system of the Romans, and in a spirit of unconscious daring carried it on through another stage of development. Their old Gothic, with all its flamboyant capacities, with all its delicate embroideries, its moulded and fretted chamfering, its elaborate cuspidations and crocketed finials, stood "patiently remote from the great tides of life." It could not give utterance to the joy of a secular liberation the basis of which was the revival, or rather the adaptation, of pagan learning and pagan art. In fact, two centuries ago Mediæval art had in the cathedrals given expression to its highest aspirations and its most beautiful thoughts under an impulse which could never return again. Reminiscences of the age of chivalry, of crusades and of hieratic domination, whether because of a certain sentiment of romantic melancholy, mysticism or ascetic meditation which lingered about them, or because of their technical limitations when expressed in art, could hardly furnish the expression needed in the architectural manifestations of a time when the revival of learning and letters was liberating reason and imagination from the vagueness and poverty in which they had so long been held by the homilies of the fathers and by the crude speculations of monastic schoolmen.

Gainsborough and Reynolds.

Soon after Gainsborough settled in London Sir J. Reynolds thought himself bound in civility to pay him a visit. Gainsborough took not the least notice of him for several years, but at length called and solicited him to sit for his picture. Sir Joshua sat once, but being soon afterwards affected by a slight paralytic stroke, he was obliged to go to Bath. On his return to town perfectly restored to health, he sent Gainsborough word that he was returned, to which Gainsborough only replied that he was glad to hear he was well, and never after desired him to sit or called upon him, or had any other intercourse with him till he was dying, when he sent and thanked him for the very handsome manner in which he had always spoken of him, a circumstance which the President has thought worth recording in his fourteenth discourse. Gainsborough was so enamoured of his art that he had many of the pictures he was then working upon brought to his bedside to show them to Reynolds, and flattered himself that he should live to finish them. Gainsborough was described by Windham as a very dissolute, capricious man, inordinately fond of women, and not very delicate in his sentiments of honour. He was first put forward in the world by a Mr. Fonnereaux, who lent him 300*l*. Gainsborough, having a vote for an election in which his benefactor had some concern, voted against him. His conscience, however, remonstrated against such conduct; he kept himself in a state of intoxication from the time he set out to vote till his return to town, that he might not relent of his ingratitude.

The Function of Taste.

Genius, as far as it has to do with painting, may be considered as the union of taste with imagination. Now, imagination seems to be a power to which instruction can scarcely reach; and if in any degree amenable to direction, it can only be so through taste—a faculty that is admitted to be capable of much improvement by cultivation. By taste, in its most perfect condition, we understand not the mere relish of beauty and of truth, but true judgment; the power that estimates all things belonging to art relatively as well as singly. It has also as much to do with the heart as with the head, for material beauty will never be fully known but to him who knows also what is moral beauty. Imagination may be considered as the active power of genius, taste as the controlling and directing power. It is the temperance which Shakespeare recommended to the actors in their bursts of passion; but, as he also told them, it is not tameness, neither is it mere fastidiousness, much less timidity. It will dare all things for a great end, but it never seeks merely to astonish, nor is it ever presumptuous. It is not exclusive; it objects not to ugliness or deformity, but it assigns to them their proper places. It excludes only falsehood, and this it detects as readily under the most magnificent disguises as when it affects the most childlike simplicity. It would be easy to expatiate on the attributes of taste until it was proved that no man had ever possessed it; which is indeed true of taste in the abstract, for in the most perfect human works there exist flaws from the want of it, and which are, no doubt, always traceable to partial cultivation and the accidents of local position and evil associations. And if taste be the proper director of the imagination, it is also modified in its turn, in every individual, by the particular cast of the latter.

Ornamental Castings.

For small castings in metal, such as statuettes or works of an ornamental character, sand is usually employed to cast in. As this material has the advantage of allowing an escape of air, and its cohesive properties are so great as to admit of considerable liberties being taken with it during the process of moulding, it is generally preferred. Simple cylindrical articles are easily moulded, and it is only when there are figures, foliage and deep under-cuttings introduced that the operation is attended with difficulty. This difficulty consists in judging as to the number of cores to be employed. These the workman makes upon the pattern, removing them for the purpose of lifting the pattern out. The small pieces of sand or cores are then replaced, the mould dried, closed and held together, in order to receive the melted metal. When very great delicacy of surface or texture is desired, the ordinary sand has its capacity improved for receiving the impression by dusting upon it a very fine loam, and thereafter powdered or ground wood charcoal, the consequence of which is that the most delicate line, mat or chase is imparted to the sand matrix, and is in turn communicated to the casting. Patterns for ordinary plain work, either round or square, are made in the turning lathe, or by planes and chisels. Ornamental patterns of figures or foliage are in general first modelled in wax, from which a cast in lead or tin is taken. This cast is trimmed up neatly, and from it a cast is taken in brass, which is carefully smoothed up and chased. This then becomes the permanent pattern from which any number may be cast. Care and attention in this department is of the utmost importance in the economy of time, and to the ultimate perfection of the work.

The Study of Painting.

With apparently greater advantages than the world ever before presented, the young painter has many more real difficulties to contend with in the commencement of his studies now than at any former time. The very wealth of art creates one great source of embarrassment. The student is apt to be so impressed with awe by the works of the great masters now congregated in galleries, that any attempt to rival or combine their excellences seems to him to be utterly hopeless. He wanders through the public collections, admiring rather than studying what seem to him the productions of an order of beings that are never again to exist. He settles it in his mind that an approach to them will be happiness enough for him. His aim therefore is low from the first, and, as is always the case, he falls short of his aim, and dooms himself to mediocrity for life. This is the defect of one class of minds. Another class find it easy to imitate in a superficial way, but in a way sufficient to catch the admiration of superficial critics, the dash of art. They omit details, because great painters have done so; but they do not see that the very omissions of the great masters are full of slight and exquisite indications of knowledge which they have not acquired. They endeavour to grasp the end without being acquainted with the means, and though they may impose on themselves and the world for a time, the emptiness of their pretensions is sure to be discovered at last. It is in reference to the productions of such minds that old Richardson says, "there is bold painting, and there is also impudent painting." Another error, and a very pernicious and prevailing one, is sectarianism in art—the bigoted admiration of any one school or any one master, however deserving of admiration, to the exclusion of all the rest. There cannot be a greater mistake, for it has been remarked that he who pins his faith wholly on any one particular style is exactly he who least perceives that in it which is its peculiar charm. All the great masters throw light on each other, and no mind will thoroughly relish Raphael and Michel Angelo which does not thoroughly relish Rubens and Rembrandt. Nay, the simplicity and purity of feeling of Giotto, Angelico, and others of the early Italian masters will be best felt by him who is most sensibly alive to every variety of excellence that has been displayed by the painters of all ages of the world. A bigoted sectarian always admires in the wrong place, clings to what is merely accidental, to that which belongs to the time and country in which the painter has lived, and ever fails to perceive that which is essential in the style, that which is catholic, and which therefore connects all the first-rate minds of all ages with each other. It is this essence which is really the art; all else is but its dress.

Ideal Forms.

The ideal in form, it is agreed, is that best condition to which nature always tends, and from which in her individual productions she is only intercepted by accident. The accidents, however, that interfere with the perfect development of the human figure are, by the artificial habits of life, so much more numerous than those which operate on the forms of other creatures, that perfect adult human beauty is not supposed possible to have an existence in any individual, at least not in civilised society. And, indeed, were every natural condition there favourable to beauty, the wearing of clothes alone would prohibit perfection of form. Luxury, poverty, disease, the habits attending particular employments, and above all, vice, the parent of all real evil, are the chief destroyers of human beauty. We scarcely apply the word ideal to the forms of infancy, for we have every day frequent opportunities of seeing far more of perfection of form in young children than art ever has reached or perhaps ever will reach. Neither is the term applied to the form of any other animal than man, for we have no need in the representation of a beautiful horse, a bull, or a dog to consult either sculpture or painting for ideal types, as we can easily find better models in nature than these can supply. But for the best proportions of the human figure we must have recourse to Grecian art. And we must ascertain its principles, for the mere mechanical process of copying it, however it may help us to obedience of hand and correctness of eye, will never make us masters of form. Nor can the antique be studied to advantage without a constant reference to nature, otherwise we are in danger of becoming blinded to what it may have of mannerism and of learning to prefer those systematic deviations, not from individual nature, but from some of her invariable forms, which we find in many celebrated statues of antiquity, as, for instance, where a more arched shape is given to the lower margin of the ribs in front. We must remember also that many of the antiques we possess are but copies, the originals of which are lost; some may be copies of copies; many have hands, heads and limbs indifferently restored; and many, though fine works, are not the productions of the best ages of sculpture. How easily we may be led into mannerism if we do not, in imitating art, constantly refer to nature will appear from the example of Raphael himself, who in his horses, from a singular inadvertence, continued to follow the types of

the earlier masters, and the horses in the *Attila* have human eyes like those in the *Campo Santo*, and are in no other respect more natural. Indeed, the true form and character of the horse was not seen in modern art before Rubens gave it, whose animals generally are so superior to those of all preceding painters that he would have left a great name had he been known only as an animal painter. The beauty of the human, as of all animal, forms is in a great degree relative. The most perfect proportions of the woman are in some respects the reverse of beauty in the man, and the long body and short legs of the child would amount almost to deformity in the adult; and the same is, in a degree, true of grace. The attitudes of children are proverbially graceful; yet there are some proper only to childhood, and which would be absurd in elder life, as there are attitudes graceful in women that belong to them only. The slightly inward inclination of the knees in the structure of the female may be often increased with an increase of grace; but any such deviation from the straight line from the hip to the foot in man becomes disagreeable; and though the representation of peculiar characters may sometimes require us to give an effeminate structure to the man or a masculine one to the woman, this must always be at the expense of the beauty proper to each.

Egyptian Bricks.

Egyptian bricks were generally crude, mixed with straw and dried in the sun; kiln-burnt bricks were occasionally used in foundations, quays, the raised terraces on which the towns were built, or in any situation where they would be exposed to frequent contact with water. The crude bricks were about 15 inches in length, 7 inches in breadth, and a little more than 5 inches in thickness: this simple material was found to be peculiarly suitable to that dry, hot climate, where rain scarcely ever falls, and were further recommended by the ease and rapidity with which they could be made. The brickfields afforded abundant occupation for numerous labourers, and the demand was so great and the trade so profitable, that the Egyptian Government took it into their own hands and considerably increased the revenue by this monopoly. In order to prevent unauthorised persons from engaging in this manufacture, a seal containing the name of the king or some other privileged person was stamped upon the bricks before they were dried; numerous bricks, thus stamped, have been found at Thebes and elsewhere. According to Vitruvius, crude bricks should only be manufactured in spring or autumn, in order that they may dry slowly; those which are made in the heat of summer speedily dry outside, while the inside remains moist: the brick thus becomes defective and easily gives way. He further observes that bricks ought to have been dried five years before they can be considered fit for use, and that their having been so should be certified by a magistrate. If these rules originated with the ancient Egyptians, it is probable that the stamp before mentioned may also have been a warrant of the solidity of the bricks.

J. H. Mortimer.

The talents of Mortimer were prominent in his day, and generally directed to the higher objects of his art. King John signing Magna Charta and the Battle of Agincourt, of which there are well-known prints, afford no mean specimens of his strength in history, of his conception of character and his powers of composition. His mind seemed to partake in a great degree of that romantic cast of thought so conspicuous in Salvator Rosa. He delighted to represent banditti under all the circumstances which the mode of life pursued by these picturesque plunderers naturally suggests to a fertile imagination. But though he could exhibit the robber with success he wanted the powers of Salvator to place him in an appropriate scene. He was inadequate to express that wild grandeur of solitude, that savage sublimity of nature, where the ferocious and half-armed freebooter appears to be the characteristic inhabitant. The works of Mortimer in general show considerable skill in anatomy, and a well-grounded knowledge of the human figure in all its varieties of action and repose. He drew with great facility, particularly with the pen, which he used in a style of uncommon spirit and effect; his sketches with this instrument may be classed among the happiest of his productions. His forms are sometimes incorrect, but seldom vulgar; and though his characters are occasionally overcharged and exaggerated, they rarely fail to be appropriate and expressive. In the other parts of his art the merits of Mortimer are not equally conspicuous. His finished works retain but little of that vigour and spirit of execution which characterise his sketches. His oil pencil is tame and laboured, his colouring betrays no great sensibility to the beauties of tone, and his effects little scientific arrangement of light and shade. On the whole, however, his powers appear to have been of a superior class, and such as, under better regulation, might have raised him to the highest rank of competition. His productions were few and irregular; they were flashes of intellect which, while they dazzled by their own light, strongly impressed men with the brilliancy of that fire from which they proceeded.

NOTES AND COMMENTS.

THE name of JONATHAN SWIFT is associated not only with the squalid part of Dublin in which his deanery and cathedral stood, but with several country houses in Ireland. A small property known as Loughbrey Castle and demesne, within three miles of Stewartstown, in the county Tyrone, which was sold a few days ago, is one of the places distinguished in that way. In the grounds stands "Dean Swift's Cottage," and according to tradition a part of the "Tale of a Tub" was composed there. That Rabelaisian treatise on doctrine appeared in 1704, and it was serviceable to the High Church party of those days. But a book which VOLTAIRE could recommend to his followers was not a foundation for orthodoxy, and it lost SWIFT the mitre for which he longed. He never acknowledged the authorship, although his exclamation about the genius he possessed when he wrote it was evidence enough. TOOKE, the bookseller, was aware that SWIFT was the author, and FAULKNER, the printer, testified that the Dean informed him of the fact. PORSON'S discovery of the coincidence between a sentence in "Gulliver's Travels" and another in the "Tale" may also be considered as evidence. GULLIVER says he was confined by fourscore and eleven chains locked to his left leg by six-and-thirty padlocks, while in the introduction to the "Tale of a Tub" we read:—"Fourscore and eleven pamphlets have I writ under three reigns, and for the service of thirty-six factions." The Dean evidently forgot himself when writing one of these two sentences. The mystery that surrounded SWIFT does not impart much interest to his abodes, and we doubt if the cottage at Loughbrey was valued at a high rate by the gentleman who gave 8,300*l.* for the castle and demesne.

A VERY few months have elapsed since Mr. W. WOODWARD vigorously opposed the carrying out of the system of decoration that is in progress of realisation at St. Paul's. We are pleased to see that in disregard of a suspicion of inconsistency he now puts forth a scheme for obtaining aid towards the completion of the work. WREN was a zealous Freemason, and held high office. Accordingly Mr. WOODWARD offers the following suggestions:—"That every lodge in England forego one banquet this year, and devote to the decoration fund the amount which would probably have been expended on such banquet. That a grand Masonic ceremony, with His Royal Highness the Prince of WALES at its head, take place this year in St. Paul's to further direct attention to the needs of the cathedral, and to aid the decoration fund. That inasmuch as the contributions resulting from these efforts would probably not be sufficient to complete the scheme of decoration, a certain portion—say, the dome and the transepts—be set apart as that with which the Freemasons would be particularly associated, and that the work be completed before December 1897, the bicentenary of the opening of the choir for service." There would be no excessive self-sacrifice imposed on any Freemason by Mr. WOODWARD'S proposals, and it is remarkable that the remembrance of an ancient grand master's connection with the building has not inspired the raising of contributions at an earlier time.

THE President of the gas managers of Scotland, in his address, did not ascribe to the severe frost all the fractures in pipes which have caused much loss of money and inconvenience in the North. In many cases it might be the sole cause, but he was of opinion that generally partial fractures or defective joints previously existed, though from the open nature of the ground any escape was better able to diffuse itself, and therefore did not make its presence felt. The amount of damage that was caused to gas and water pipes will probably remain an indefinite sum. In Birmingham it was found necessary to lay 1,675 new lengths of pipes, for there were fractures in those laid under 176 roads and streets. Where the bursts had been numerous it was considered more economical to entirely relay the pipes, and this was done, the pipes in most cases being replaced at a greater depth. It was found in many cases that the pipes were not originally laid at a sufficient depth, and that, the level of the roads having been altered from time to time, the pipes had been brought too near the surface. The

expense is estimated at 15,000*l.*, which will mean an addition of 2*d.* in the pound to the rates. In London the inhabitants will not have to bear the cost of reparations unless in an indirect form, and that thought may lighten the inconvenience. The water companies cannot expect any commiseration.

SANITARIANS who visit Jerusalem are generally scandalised about its condition, and some thirty years ago the Baroness BURDETT COURTIS had a survey made with a view to a water-supply. The work was entrusted to an Irish surveyor and agent for sale of ordnance maps, Dr. IRWINE WHITTY. On one of his maps he indicated the position in which he supposed SOLOMON'S rampart once stood. The excavations of the Palestine Exploration Fund have revealed that the guess was a shrewd one, for the wall nearly coincides with the line laid down. While we are ready to give Dr. WHITTY all the credit which belongs to his feat, we must demur to his endeavour to have the ancient wall called "Whitty's Wall," although he believes that, whatever may be done, that name "can never be erased, never more while Zion's Hill and Zion's Wall remain in human thought, endeared to human memory, be craftily ignored, concealed, obliterated, or even tampered with." It is astonishing how easily a Celt believes he can become famous, and the craving after notoriety has done incalculable harm to Ireland as well as to France. We do not suppose that the excavators of the Exploration Fund were guided by Dr. WHITTY'S dotted line, or that it saved a shilling expense. If, however, he has served the cause he is only one among many zealous men who have toiled for years without any desire to have a temple, a sepulchre, or a wall called after them.

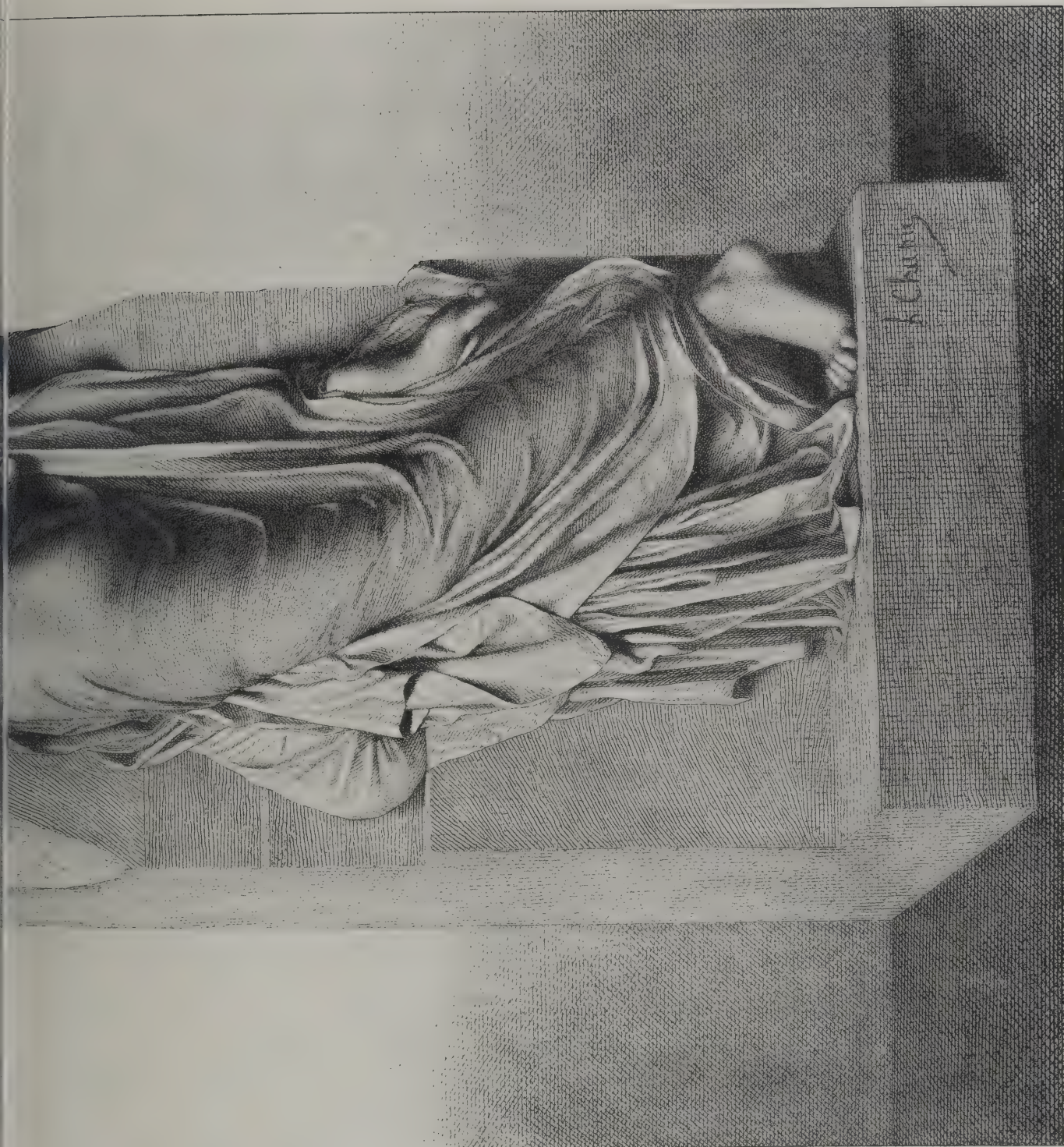
AN agreement has been entered into between the French Government and the Commune of Périgueux by which the chapel dedicated to St. JOHN will henceforth be recognised as one of the historic monuments of France. It is of much later origin than St. FRONT, as it was founded in 1521. But it has many attractions as a work of the sixteenth century. The building stands in need of reparations, the cost of which will now be shared by the State if not entirely defrayed out of the public funds.

THE exhibition at Athens, which is to be opened on the 28th inst., has been organised by the Société Biotechnique. Although intended only for native products, it will be accessible to foreign exhibitors of such articles as may assist in the development of Greek industries. All expenses will have to be borne by the exhibitors, who will, moreover, have to pay a tax of 2 drachmas for each article worth 100 drachmas. Articles worth more will be charged half a drachma per hundred in addition. The committee of the exhibition will sell the exhibits at a commission of 5 per cent. The exhibition will be open each year from March 13 (March 1, O.S.) to July 12 (June 30, O.S.), and from September 27 (September 15, O.S.) to January 27 (January 15, O.S.).

THE French Ecole de Rome, of which, as we mentioned last week, the Abbé DUCHESNE has been appointed director, must not be confounded with the school in the Villa Médicis, which is the goal of so many young students. The Ecole de Rome has a local habitation on the second storey of the Farnese Palace. There are only a dozen members, who have not to follow any courses of lectures in the establishment, for the school is without professors. Rome itself and its treasures are the objects of study, and the members are free to engage in any kind of investigation which they may consider advantageous. The office of the director is to advise them and to facilitate their researches. The school was founded in 1873, and at first there were only two students. One was the Abbé DUCHESNE, who is now director; the other was M. EUGÈNE MÜNTZ, the conservator of the Ecole des Beaux-Arts, whose scholarly works on the history of art are a testimony to the use he made of his opportunities in Rome. The Abbé DUCHESNE is no less eminent as an authority on history, archæology and philology, but his works are addressed to a more restricted circle of readers than those of his fellow student.

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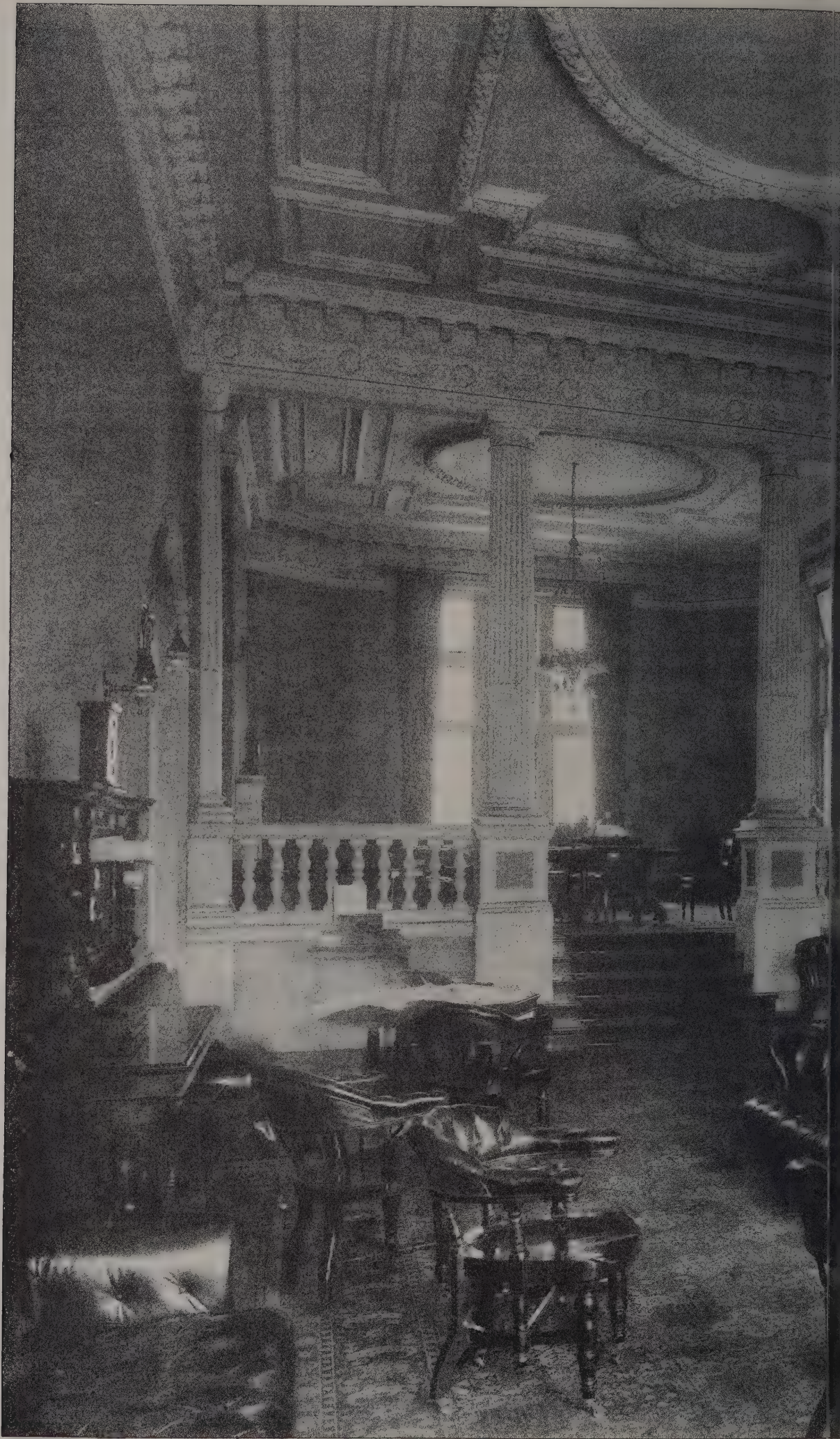




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"YOUTH" AT THE MONUMENT OF HENRI REGNAULT.
(ECOLE DES BEAUX ARTS, PARIS.)

By M. CHAPU.



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STATION HOTEL, NEWCASTLE.
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ILLUSTRATIONS.

YOUTH AT THE MONUMENT OF HENRI REGNAULT.

AMONG the men who fell in the Franco-German War was HENRI REGNAULT, who although a young man, had attained a prominent place among French painters. His friends resolved to erect a memorial of him in the Ecole des Beaux-Arts, and permission was given by the Government. Afterwards the character of the monument was altered, in order that it might commemorate other students who were slain in the cause of their country. The dominance of the part relating to HENRI REGNAULT suggests the original intention. The painter's bust is placed on a stele, and La Jeunesse, or the representative of the subscribers, is shown as about to place a branch of laurel beside the bust. On either side are Ionic columns surmounted by a pediment, the whole being an example of French neo-Grec.

READING-ROOM, JUNIOR CONSTITUTIONAL CLUB, PICCADILLY.

READING-ROOM, NORTH-EASTERN STATION HOTEL,
NEWCASTLE.

INDUSTRIAL ART.

AN Arts and Crafts Exhibition was opened in the Queen's Rooms, Glasgow, on Saturday. The place was decorated from a design by Mr. Rowntree, architect.

An address was delivered by Professor Baldwin Brown. He said that the exhibition was called an exhibition of arts and crafts, or they might call it perhaps an exhibition of home industries. These words—arts and crafts and home industries—represented a movement which had been going on for some time, and which had been productive of some very good results. The movement rested, he thought, upon two principles. The first was that it was of value in our lives to have a certain element of beauty and of interest in the objects of our immediate surroundings. He did not mean beauty and interest in expensive pictures and masterpieces of sculpture. He meant rather this element of art in the objects which surround us—our furniture and fittings and the material environment, if he might call it so, of our daily life. The second principle was that this beauty and interest in objects of this kind was best secured when they were not turned out by the thousand by machine, but made by hand, and so carried with them a certain mark of the individuality of the craftsman. He thought there was no need for him to offer any abstract arguments as to the truth of the first principle. He knew there were a great many who would controvert it, or, at any rate, did not see any force in it. There were many excellent people who were perfectly satisfied if their houses were warm and comfortable, and if the furniture and fittings served the purely utilitarian purpose which was their primary object, and who thought that this talk about beauty and art and that sort of thing was rather unpractical and nonsensical. Those people were best left to the quiet working of the sounder and more liberal ideas on this subject which were so very widely diffused now throughout the community. One had only to look at the works brought together in that hall, and to the interest which that show had excited and would excite during the time it was open in Glasgow, to feel that these sounder and more liberal ideas on this subject were certainly fully alive in our midst. The exhibition contained a great deal that was of first-rate artistic excellence, both in the matter of idea and design and also in execution. He had not the least doubt, however, that they would see a good deal that was not up to the first standard. Whatever the actual character of the exhibits looked at from the highest artistic standpoint, they might be sure that they were all done according to the right principle, and on the only principle he thought on which it was possible for productions of industrial art like this to be successful—they were all done by workers who had taken a real, a genuine, a personal interest in what they were doing. The workers had put a little of their own thought and of their own art into their productions, and had turned them out with a certain stamp of their own individuality upon them. There ought not to be anything remarkable in this. There would not have been anything remarkable about it in any other age of human history but our own. From the beginning of human history things made primarily for use were also made beautiful and interesting. Within this century, within the memory of some now living, that natural connection between art and objects of utility suddenly came to an end. The tradition stopped and began, they might say, to die away, and art and beauty became divorced from objects of utility; and where beauty and art were still to be found in objects of utility they were put there as something extra, as it were, for which often a considerable additional price had to be paid. In various ways attempts had been made to counteract the

tendency of the time and to restore as far as possible the spirit, if he might call it so, of artistic craftsmanship. These efforts had been partly official, partly private and sporadic. The great institution of the Science and Art Department was founded with this view shortly after the Exhibition of 1851, and that had established schools in every important centre of the kingdom, some of which, like the excellent school in Glasgow, had done, and were doing, very excellent work. Besides that, and nearer our own time, organisations had been established in various parts of the country for the encouragement of what he might call local handicrafts. Endeavours had been made to keep alive any particular artistic industry that had survived to this age, and where they had not survived to establish something of the kind. Still, he thought there had been possibly a certain defect in the system—he was speaking rather of the official system of the Science and Art Department—that had perhaps stood in the way of good which might have been done if another principle had been adopted. What he meant was that the Science and Art Department had been too pessimistic in the way in which it had dealt with ornament. It had looked upon ornament too much as if it were a dead thing belonging to the past, as if it were an independent thing to be used or let alone. There were two very familiar watchwords of the official publications of the Science and Art Department which exactly expressed this view, which he ventured to think, was in many respects an erroneous view. The watchwords were "historic ornament" and "applied ornament." He felt very strongly that whatever ornament was, or ought to be, it ought not to be looked upon as historic or applied. What he thought was that ornament should be treated as a thing that is alive and that grows, and should be considered as a thing not apart from the object adorned—not a thing that could be applied ready-made to an already ready-made object of use—but as a thing which should grow out of the material and the process; it should be in intimate and organic union with the object. A defect in our present system which, however, was being rapidly remedied, was that the designer and the workmen were too much apart. Instead of being, as they were all through the ages of the past, one person, they were now two. One, the designer, had got rather out of touch with the material and the process, while the workman on his part had forgotten that he ought to be, what he was in all periods but our own, an artist in his way as well as a craftsman. Designing was too much an affair of paper and pencil, whereas it should be done, he ventured to think, in the material and in close connection with the process by which the material was wrought. The truth of this was certainly seen in Glasgow, where there were workshops established in close connection with the school. He hoped before very long that no school of art or of design would be considered complete unless there was a set of workshops connected with it. In these workshops he should have a smith who could hammer iron, a silver worker who could beat up silver and a joiner who could put pieces of wood together. He would take the pupil down into the workshop and show him the capabilities of the material for which he was drawing a design. In that way he thought the designer would come to see that ornament really grows out of the character of the material and the process. He noticed the other day that a great traveller, Mrs. Bishop, had received a present of a collection of objects of art and industry from the King and Queen of Corea. He was quite certain that the objects produced there would be on the whole excellent in taste and colour, and in all essentials which went to make a pleasing artistic product. Compare that for a moment with the great collection of objects which ought to have been objects of industrial art which were on view a few years ago in the collection of jubilee presents to the Queen. He supposed in the whole history of the earth there was never such a collection of tasteless and ugly things brought together, and he trusted that under the altered conditions it might never be possible to bring together such a dreadful collection of things which were exactly what they ought not to be from the artistic point of view. There was really only one good thing in the collection, and that was a copy of the famous Roman fountain of the Renaissance. Why we had lost the tradition was that designer and workman were dissociated; and why the tradition was still maintained in far off regions like Corea was that the unsophisticated workman was still in touch with his material; he started from that and worked it. In this revival of artistic craftsmanship those who were not professional or non-professional artists had an important part. They had the onerous, but at the same time honourable, task of being paymasters. Unless there was encouragement for artistic work of the kind that they saw in part accomplished there there was no chance of the thing really flourishing in our midst. Hand-made work would necessarily cost more than machine-made work. But take the difference in value. It was simply infinite between a fine piece of hand-made industrial art and a piece turned out by a lifeless

machine. Moreover, a hand-made production was a unique thing; it could never be reproduced, and they had the advantage of having something that nobody else possessed. In the case of a machine-made production, every one of their neighbours could have the same thing by going to the same shop and paying the same price. When that was more widely realised he did not think that there would be any complaint of want of patronage for this new or—he would rather use the term—this revived, artistic craftsmanship.

Mr. F. H. Newbery proposed a vote of thanks to Professor Baldwin Brown for his address. It was, he said, a sign of the times that a professor of the fine arts belonging to a university such as Edinburgh should, in a spirit, he thought, as broad as the world, embrace under the word art all the crafts that the human hand was capable of accomplishing. Fifty years ago that would have been almost impossible. As far as the Science and Art Department were concerned they were the servants of the public, and while they would take no initiative, they would follow a lead. Men like Morris and Crane were their examiners. If they could get better men they should do so, but he was sure that the Department very gladly did what these men required. The Department was very squeezable just now. They had been sitting on the fence for a long time, but with the influences that were being brought to bear he had no doubt they would come down in a year or two on the right side.

THE ÆSTHETIC UNITY OF THE FINE ARTS— MORE ESPECIALLY IN RELATION TO ARCHITECTURE.*

IT is only necessary to preface my remarks by saying that I address you as an artist to artists, in the broadest and most catholic sense of the term; fellow-worshippers at the shrine of the beautiful in nature, who feel their dearest ambition is to capture a ray of her glory and crystallise it into some form of art, which may reflect its refining influence for the good and happiness of mankind and be an incentive to virtue and noble deeds.

In speaking of architecture it is not merely in its constructive sense of building, but the conception and creation of such edifices as claim to possess elements of grace and beauty, dignity and attractiveness, which should elevate the soul of the beholder and be a joy for ever.

God created man in his own image—body, soul and spirit—and the first mental activities the primitive creature put forth were to build his rude habitation, carve ornaments on the door-sills, colour them with rude pigments, and chant his dirge or war song. This imitative activity was the genesis of the arts of design; painting, architecture and sculpture, together with poetry and music—making the five sister muses of form, proportion, colour, melody and rhythm—the media by and through which the good and beautiful commune with the soul of man and satisfy his intellectual cravings. And are not these faculties intimately connected and associated with each other in their highest æsthetic fulfilment by some hidden mystery not yet revealed, the principle underlying each being one and the same?

An apt figure of the five sister arts, their intimate relationship and interdependence, suggests itself to the mind in the structure and vocal organs of the human body.

1st. The skeleton—that wonderful mechanical arrangement upon which all other parts depend, combining, as it does, economy, lightness, strength and ingenuity, suggesting the building or architecture.

2ndly. The outer covering, *i.e.* the muscles, giving the contour of form, beauty and motion, expressed in sculpture.

3rdly. The colour and texture of the features and the skin represented in painting.

4thly and 5thly. Speech and vocal sound, the organs of poetry and music.

Here, then, is the perfect model set up by the Divine architect, the synthesis of the fine arts, comprehending or embracing colour, texture, form, harmony, melody, rhythm and proportion—a living expression of the beautiful in mind and matter.

In the language of the immortal bard, "What a piece of work is man!—how noble in reason! how infinite in faculties! in form and moving how express and admirable! in action how like an angel! in apprehension how like a god!—the paragon of animals."

Before leaving the masterpiece of creation as the type or ideal model of beauty, examine for a moment his component parts. The osseous structure called the skeleton, marvel of economy and strength for the burden imposed upon it; the cranium, with its dome and arching brow, exquisite precision of sutures that join the skull; the vertebræ, ribs, pelvis, con-

dyles of the limb bones, with their perfect ball-socket joints. Here is fitness and utility, though not necessarily beauty, yet models for the builder and mechanic in this age of steel.

It is when we consider the myology or muscles that life and beauty are apparent, and both architect and sculptor have been inspired with the perfection of form for their models. The design of the Greek and Roman mouldings is evidently inspired from the profile of the face, mouth and chin; the gently expanding and tapering columns from the limbs; the groining of the ear, chiselling of nose and nostrils, have also influenced design in architectural forms. In woman, though less powerful than man in structure, the still more graceful curves of form present a veritable incarnation of unspeakable loveliness. Thus we see form in its highest type, which receives its consummation in its texture or outer covering, the skin, the human epidermis; as seen on the cheek of a beautiful woman, combining and blending, as the painter learns, every delicate and luscious tint with the bloom and down of touch—a setting indeed for that incomparable jewel of all, the eye—the soul's window. In colour and texture added to form, we reach the absolute, the highest æsthetic ideal of beauty. This trinity in unity of colour, texture, form (form including proportion), constitutes the essential and inseparable elements which the master builder has incorporated, and shows the relation and dependence of each upon the other to express a perfect *ensemble*, each of the links being a *sine qua non* to the success of the whole, and without which neither the sculptor, painter, architect nor poet can create his airy palaces or portray his themes of lore.

Bulwer well appreciated this unity in the elements of the beautiful in Claude Melnotte's description of the home to which he would take his bride could love fulfil its prayers. "A palace lifting to eternal summers its marble walls from out a glossy bower of coolest foliage; musical with birds, whose songs should syllable thy name . . . while the perfume lights stole through the mists of alabaster lamps, and every air is heavy with the sighs of orange groves, and music from sweet lutes and murmurs from low fountains that gush forth in the midst of roses."

What is the principle in design that predominates in the human form and runs all through nature? It is a succession of curved lines of varying length, entirely free from harshness, producing to the senses a feeling of blending, melody, buoyancy and harmony.

Beauty's wave in human form,
In rose or lily, bird—
In womanhood transcends all things,
'Twas always so, I've heard.
'Twas so in ancient days, when Art
Sat graceful on her throne,
And gave her sons that curious line
True artists love to own.

The religion of the ancients required a habitation in which to worship their deities and store their *lares* and *penates*, and from the four walls of mud and wood, or brick or stone, grew the temple. Ornament, columns and capitals were added; then the gable broke the monotony of the horizontal. Colour followed. The beauty of texture was absent, till marble or an imitation filled the want. Still life was not there—human life. At length the sculptor's chisel and painter's brush filled the pediment with the deed of heroism, and enriched the walls with polychrome. Finally the temple became a work of symmetry, power and beauty; every member was studied with regard to optical value and refinement—carving, gildings and tinting drank in the glorious hues of the prism, which shone resplendent upon its harmonious proportions.

The life of action and deed of valour were implanted there in the metopes and friezes. The magnificent quadriga and acroterium statues adorned the angles. Caryatides took the place of columns; finally the temple became clothed with the matchless genius of Phidias and Apelles—fit habitation indeed for the crowning glory within, the shrine of the god Zeus or Athene in chryselephantine. Gold, ivory and precious stones; what would Homer have said had he seen these wonderful achievements in art?

It was centuries before he sang of the god:—

He said and nodded with his shadowy brows;
Waved on the immortal head the ambrosial locks,
And all Olympus trembled at his nod.

Remember, it was not the intrinsic value of the material that made the masterpiece. Its value lay in its incomparable embodiment of benign beauty and sublime expression. The genius of Phidias, appreciating the importance of æsthetic unity, at once saw that even marble failed, beautiful as it was, to fulfil the highest ideal of texture as representing the flesh, and so chose ivory, which of all material bears the closest resemblance to the human epidermis. White marble is beautiful when fresh from the chisel, but without great care soils and loses its appearance, till old age or time has turned it into the colour of ivory, like the Venus of Melos in her hallowed shrine

* A paper read by Mr. Hamilton MacCarthy at the fifth annual convention of the Ontario Association of Architects, and published in the *Canadian Architect*.

in the Louvre, or the memorials of old gold hue such as are seen in Westminster Abbey, or the Elgin Marbles from the Parthenon and now in the British Museum—the latter cut 438 B.C.

The true artist or *dilettante*, who has drank the nectar from those gods of form and beauty, Phidias, Myron, Scopas, Polycleus, Praxiteles and others, of the age of Pericles, can only contemplate their works with wonder and fascination at the supreme mastery gained by these sculptors of the human form over their art, yet mingled with regret that so few examples have escaped the hands of the iconoclast and the ravages of war.

We who have worshipped at the feet of Hermes, Aphrodite, the Discobolus, the Gladiator or the Illisus, or the other masterpieces that adorn the Parthenon, feel that this is not the occasion to enter upon the various merits of the works of those great artists. They have been of incalculable value to art and history. They tell the story of their age. We acknowledge them to be the absolute and immutable standards of physical beauty, the ideals for the artists and *dilettanti* of the world.

The pediment of sculpture expresses at once grandeur, power and life, and it is to be regretted that architects of the Victorian era have not been more inspired with the use and possibilities of statuary—the most profound and longest enduring form of art—especially in connection with public buildings and monuments, in which the nation's history should be indelibly written.

And how have we of the eighteenth and nineteenth centuries treated the Classic orders? These forms of architecture have been largely used for public buildings, both in Great Britain and America, but what relation have they borne to their ancient prototypes? Where are the sculptured pediment, frieze and metopes of beauty and action, once instinct with life and imagery, the tinted walls and coloured story? They have departed; the sheen of the rainbow has gone from the Classic mouldings; texture of marble, mosaics, encaustic and polychrome, all omitted; Phidias and Apelles are banished; the temple has fallen. The diadem has been torn from her brow, the jewel from her breast, the robe of beauty replaced by sackcloth and ashes. The skeleton alone, in dingy grey or blackened stone, is all that remains to us moderns to help us to imagine we are beholding a noble Greek or Roman columnar edifice and to enthuse about. Surely an anachronism in art.

With the extravagance and luxury of imperial Rome the purity and beauty of Greek sculpture were lost, and with Rome's final destruction all art was extinguished, except that of the monks.

From the Byzantine and the basilica evolved the Gothic, an entirely new departure. No doubt the minaret was the progenitor or archetype of the spire and tower; but the principle underlying this remarkable revolution from an æsthetic point of view was the overthrow of the rectangular in art. The temple, shorn of its sculpture and colour, is heavy, uninteresting and depressing, and its minor ornaments, though chaste, are monotonous and severe.

Both in plan and elevation the disposition of the masses of material in the Gothic, being modelled more after nature's ideal of form, is a blending of harmonious lines pleasing to the eye. There is nothing in nature suggestive of the rectangular. The luxuriant plant-life ornament of the Early English, the clustered columns, trefoil tracery, graceful arches and groined chapels, those lofty spires, seemed to break through the burden of earthly cares, and carry up with them like incense the prayers of the Christian in worship of the true God to the very feet of heaven. "Lift up your heads, oh ye gates, and the King of glory shall come in." This was the spiritual significance of the Gothic, and it became clothed with at least earthly glory.

Colour and texture were added to form. Marbles of every tint, mural paintings, mosaics, the sculptured niche and statues—everything that wealth and art could bestow to render the habitation of God a dream of heavenly beauty. "Gloria in Excelsis Deo."

In the revival of art and learning in Italy, sculpture and painting again took their place as a power in the world. Æsthetic unity and harmony of design were insured and rendered more potent by the fact that, in so many instances, painting, sculpture and architecture were combined in the work of the same artist.

The Florentines were quick to appreciate and express their joy on the dawn of renewed artistic life. When Cimabue first taught the world to paint anew Florence proclaimed a public holiday in honour of his masterpiece—for St. Maria Novella. Nicola Pisano, Giotto, Brunelleschi, Donatello, Della Robbia, Ghiberti and other architects, painters and sculptors, the progenitors of the Renaissance, brought their genius and devotion to bring about the fuller perfection which culminated in Raphael, Correggio, Da Vinci and Michel Angelo, the four pillars or archangels of that great epoch of art, and terminated in Cellini, Tintoretto, Titian and Paul Veronese, masterful exemplars of the mundane magnificence of Venice.

The Italian revival affected the purity of Hellenic form, but it accomplished something greater—it portrayed not merely

the perfection of sensuous beauty in the form or sublime grandeur of the gods; the teachings of Christ were expressed in human sympathy and love, devotion and adoration, at the gift of God in his Son, and the struggles and throes through which man is passing to attain eternal life. What a joyous note of hope, of harmony, of sentiment, of love and adoration was theirs—Pisano, Giotto, Donatello, Della Robbia, Ghiberti.

Religious faith was the stimulus which inspired their genius and devotion. How much is art indebted to these sculptors of the early Renaissance?

In the conception of a noble edifice the architect has crossed the border line of a mere building, *i.e.* a huge cube with holes to admit light and entrance, and entered the domain of the painter and sculptor. Form in its first stage, *viz.* the handling and arranging into harmony of the gross masses or masonry, so as to bring about the greatest effect of beauty and proportion, realising a noble outline or form in the gross. The carver must now join him in decorative enrichments to make the work interesting and repay closer inspection—form in detail or abstract, still only ornament. The sculptor then takes him to a higher plane, with emblematic or symbolic figures, in *basso* or *alto* *relievo*, or round attached form in transition, in which the walls gently breathe the story or mind of the building, its history or purpose. No form of art is more profound than these children of the mist emerging from fancy into reality—form in the first stage of statuary.

Every building of importance should be treated in this way, and would therefore be an object lesson and work of interest for ever, not only to those who see it many times, perhaps every day of their lives, but also to the stranger; the most emphatic record of civic or national achievements, events or progress.

The Reformation gave the death knell to sculpture and ornamentation for a time in Protestant countries, till a church became bereft of all beauty. The Gothic was treated similarly to the Classic, shorn of its art, the shell only remaining, and all art suffered in consequence.

How sad it is to look upon our cathedrals in brick—not in form, but, alas! in texture and colour. It is only during the last quarter of this century that we are beginning to awake from this iconoclastic superstition and believe that we can worship God "in spirit and in truth," and at the same time beautify his house with tinted walls and stained-glass and other decorations.

Freedom and toleration are the spirit of the age, and the impulse in art is to discover something new and best adapted to our surroundings. In architecture we are in a state of transition, if not of chaos, and in danger of degenerating into confusion and ugliness. It is this critical stage that affords the opportunity for our architects to create a style that, while retaining all that is beautiful in the heritage of the past, will meet the requirements of the climate and be distinctly national in character, ornament and expression.

Form is the first element of the beautiful in æsthetics, and influences everything we see and hear in nature and art, from the throat of a nightingale or a Patti, the melody of a Stradivarius, to the acoustics of a building, and should be the object of study from the lowest step to the highest pinnacle of a structure. In a wider sense it also affects the laying out of streets, parks, squares and gardens; the selection of a site, the raised plateau or eminence, grandeur upon which important edifices may be erected; the fountain, steps and terraced walk, with sculptured vases and ideal statuary, such as we see at the Crystal Palace, Versailles, the Tuileries Gardens, or in Edinburgh. All are form perceptible to sight and touch, and instinct with life and power to give us joy and elevate our souls, improve our manners and relieve our daily burdens.

The modern Romanesque does not impress you with a sense of grandeur or beauty. Its basket-work ornament, unlike the longer and more graceful Gothic plant life, is indefinite and confusing, and with the horrible heads of animals called "grotesque" is barbarous. It no doubt originated in the early stages of inability to imitate life better. It is unfit for a woman to look upon, and should be banished from the front or any part of a building where the lesson of beauty should be presented. There is a place for the conventional, but as little of it as possible. The lamp of truth in art has been extinguished so many times by wars and puritanism that form still goes on crutches in the respect of carving and sculpture.

Foliage, fruit, flowers and other imitations of organic objects should keep as close to nature as possible to be of interest, due regard being paid to the nature of the material employed. Organic nature should be more largely drawn from for objects of ornament, and executed in the fulness of its natural beauty. The divine sculptor has furnished us with many noble and beautiful examples for imitation, to wit, the lion, the tiger, the horse, the ox, the ram, the hound, the deer and gazelle; the eagle, the swan, the dove and other birds; the dolphin, the nautilus and other denizens of the deep. Many of these are symbolic; all are grand or beautiful, and as ornament in appropriate positions would be of far greater interest than conventional scrolls, and serve to remind us of the wonders of nature.

The higher stages of sculpture proper, viz. figure subjects in relief and the statue, or group in the round form, may be termed the "lamp of life," and provision should be made for each of these forms in every building which claims to be a work of architecture. The relief has been described as the shibboleth or watchword of art, and has a philosophy peculiarly its own. It is specially adapted for emblematic figures, filling spaces in the architecture, and for special subjects in the history of the institution to which the building is dedicated, on the exterior or in positions where painting is undesirable.

The entrance and inner halls, vestibule and staircase, are suitable for natural or emblematic statuary, brackets for busts, and niches for statues of the genus loci, founder or benefactor, care being taken by the architect that light is provided at a suitable angle for both night and day.

The highest stage of sculpture has no necessary connection with a building, unless from local circumstances. It is reached in either the group or solitary figure, expressing an abstract motif, an emotion or passion, or any of the higher attributes of our being, or the elements of nature which may bear personification, or in national monuments where philanthropy, statesmanship or patriotism are commemorated.

The next important member of the æsthetic trinity is colour, and when we consider the share this element occupies in the book of nature—how generously the Almighty has decked his creatures—whether our wondering upturned eyes gaze into the infinite azure of the brave o'erhanging firmament fretted with golden fire, the jasper of the vasty deep, the carnation of the rose, the pallor or orange of the lily—each with its spiritual significance and relation to form and sound—we recognise at once the length and depth and breadth of his boundless generosity in this particular gift, and we marvel how it can be possible that in the nineteenth century man should, even in his most joyous and festive moments, clothe himself in black from head to foot—a colour that is always alluded to in terms of horror and associated with our worst enemy, and one that is the least seen in nature's kaleidoscope.

Colour is nature's life and light and joy-giver, and when its presence is withheld from us, our spirits are in like measure depressed. To speak of her riches requires the rhapsody of the poet; to comprehend her glory the eye and wings of the eagle, to carry us to the floor of heaven. The painter is privileged to penetrate her hidden mysteries and capture the fleeting subtleties of her ever-changing moods.

In architecture the scheme of colour decoration should receive the most careful consideration and be in relation and conjunction with the carving and ornament in form. In all important buildings spaces should be provided in the halls, staircase and ceilings, arches and domes, for special frescoes by artists of ability, affording opportunity for tableaux of prominent incidents or scenes in the life of the country, in alliance with the objects of the building. By this means the skill of our eminent painters could be utilised for the education, happiness and intellectual enjoyment of the people. Stained-glass, mosaic, furnishing and lighting should all be included in the one scheme of design, and require the same mind and care in their use, the cardinal virtue of all decoration being strictly observed, viz. the securing of cluster and space and repose, so essential in art.

In order to effect a complete æsthetic harmony, texture—its substance, or rather, material—has to be considered, which, of course, is involved so largely in colour that the one can hardly be discussed without the other, bearing, as it does, the same relation to form as form does to sound. The ancients saw the importance of producing colour and texture, and where costly marbles could not be procured, the artificial substitute approaching as nearly as possible to the semi-transparent beauty of marble was provided. Stone is the next best material, especially for carving, but cannot be relied upon to stand climatic influences, besides not fulfilling the highest æsthetic requirements. Brick as it has been used is an abomination, but we are glad to see improvements taking place in its manufacture. Greater size and neutrality of colour, combined with a soft or egg-shell glaze, may render it much more acceptable.

In the brief remarks the present opportunity has afforded me, I have endeavoured to show the important place form occupies in the elements of the beautiful, especially in its pre-eminent phases of architecture and sculpture, and the influence it must have upon the dignity and attractiveness of a city of learning, art and culture, and as the medium of expression of a nation illustrious in noble deeds and beneficence; yet I feel the fringe only of the subject has been approached.

Before concluding this paper, I venture to call attention to two or three matters seriously affecting the beauty of our city, and which constitute an outrage to good taste and common sense.

1. The dangerous and unsightly trolley, telephone and electric-light poles, wires, &c., which should never have been erected in a city like Toronto.

2. The want of public squares tastefully laid out. The objectionable mode of taxing lawns at the side of residences.

3. The disposition to build up our principal corners to an angle instead of to an octagon or circus.

4. We are now erecting municipal buildings of a costly character, and if the system of building without regard to beauty is allowed to continue, the view as you ascend Bay Street will be narrowed and the court-house dwarfed by some enterprising merchants. Such a course would be worse than a blunder, and should not be allowed to take place at any price.

Many other points in connection with the æsthetic welfare of our city demand immediate attention. What is required to prevent future mistakes, and perhaps rectify past errors, is the appointment of some central authority, such as a city architect or Minister of Public Works, to prevent the erection of unsightly buildings, and preserve important open places as gardens. Such a person or board of control should be appointed for their known taste and abilities, and they should be backed up by an association of *dilettanti*, both professional and lay, who would carefully guard the æsthetic interests of the city, and render it the pride of her inhabitants, the admiration of its visitors and the envy of other cities.

Brethren in art—as the genii and guardians of the beautiful in all that concerns the artistic progress of your country and the cities in which you dwell, you are called upon to devote your talents, your love and your watchfulness to her service; to bind yourselves together in the brotherhood of art, for her defence; for the vanquishment of the Philistine and the utilitarian; for the prevention of errors and incongruities, outrages to taste and beauty, frequently occurring, and which now threaten irreparable injury to the few remaining places of interest in this city; that you apply your genius to the development of a distinctly Canadian architecture, suitable to the conditions of the country, and upon which shall be implanted in sculpture and painting the romance and lore of her history, the valour of her sons, the beauty of her daughters and the industry and resources of her people, together with the picturesque grandeur of your scenery and skies—notes of harmony and patriotism which shall shed lustre upon your country, inspire the poet, the musician and the historian, and earn for yourselves a niche in the eternal temple of fame.

POINTS ON ACOUSTICS.*

ACOUSTICS, the science of sound and hearing, it is to be regretted, is but dimly understood. We are groping around in the dark, following a will-o'-the-wisp that we seem seldom able to catch, and when we do catch it it appears more by chance than by a previous certainty of scientific fact.

Instead of using acoustical science as the primary basis in constructing the design of a public speaking place, we too often leave it to a mere secondary place, letting it take care of itself, and apologising for bad acoustics by an artistically proportioned or decorated interior.

In this paper I shall not delve into theory but rather glean over some of the principal points in practice. In designing a church, theatre or public hall the first consideration should be proportion, length and breadth, with galleries to seat our required audience, and proportionate height of ceiling to accommodate all. Saunders's experiments give as a result that an ordinary speaker in the open air on a still day may be heard distinctly 92 feet in front, 75 feet on each side and 31 feet behind. Wren, however, claims less—his observations giving 50 feet in front, 30 feet on each side and 20 feet behind. It will thus be seen that the circumscribed area will seat roughly about 1,000 people. This area being enclosed and galleries inserted, as many as 2,000 persons might be accommodated, and allowing for conduction and retention of the sound waves, we might increase the area to accommodate 4,000 or more.

Large buildings may roughly be divided into two classes—(1) those in which the audience hears by direct radiation only, such as theatres or music-halls, when high shallow rooms are advisable; (2) those in which the audience hears by conducted radiation, such as cathedrals or other large churches without galleries, when long low buildings are best. In either construction it is bad policy to have the auditorium contain any more air than is absolutely necessary. The more air there be, the more vocal exertion necessary to set it in vibration, and for ventilation have good quick circulation, preferably from the speaker to the rear, or what is still better, use the "plenum" system, which is exceptionally good, on account of the heavier sound wave produced in the slightly condensed air.

In designing an auditorium to seat a given number of persons, a certain floor area is required, but how to divide this required area into main floor and galleries to come within a

* A paper read by Mr. David Gunn Baxter before the Ontario Association of Architects.

proper proportioned width and length, and what shall be the contour and height of ceiling are indeed vexed questions, calling for a great deal of personal observation and ingenuity; bounded by no iron rules, governed by few fixed laws, affected by the restrictions of site and finances, these limitations, together with the whims and caprices of the proprietors, make the problem to the architect indeed a difficult one.

For lecture and schoolrooms a height of 2, depth of 3 and breadth of 4, has proved extremely satisfactory, the speaker being on the longest axis. For small churches, court or other rooms, where the speaker is on the shortest axis, a height of 1, width of 2 and depth of 3, has proved good.

On account of the nodal points established by the columns in nave and aisle churches, a length of 4 to 5, width of 2 and height of 1 to 1½, works well; this is for cubical contents, but on account of the lower ceiling in the aisles the nave ceiling may be greatly increased in height over the above proportions. On account of limitations of site no definite rules can be given for theatres—generally speaking a height of 3, breadth of 4 and length of 5, is satisfactory. Many successful Chicago theatres are of this proportion.

In all buildings for public speaking, except perhaps cathedral churches, floors should be constructed on the isacoustic curve plan, straight slopes being as bad for sighting as a level floor, and if anything worse for the passage of the sound curves.

Ceilings greatly affect sound. Where flat, they should never join the walls at right angles, but in sweeping curves or coves, and are best lightly panelled. Skylights, if introduced, should have a sash at the ceiling line to cut off the contained air, which, starting in a sympathetic vibration of its own, would cause an echo, or if not, would form an eddy, much to the detriment of the free passage of the sound. If possible, it is well to bring down the ceiling on a regular curve or jogging slope, as low as possible above and behind the speaker. This considerably reduces the volume of air to be set in motion, eliminates all chance of echo caused by the eddying of sound vibrations at this point, and directs the waves out into the hall. In theatres a line should be drawn from the top of the proscenium arch to the top of head room over the highest gallery at the rear wall, and the ceiling kept on this line, of course not a straight slope; cut the ceiling up into steppings, coves and panels. This helps artistically, and also breaks up the continuous reverberation which would cause echo from the rear wall. It is also advisable to have theatre ceilings follow the curve of the proscenium arch for some little distance out, at least as far as the last box. Vaulted ceiling churches are exceptionally good for speaking in. The ceiling breaks up continuous vibration, and the columns help to direct the sound forward by forming nodal points on which the sound curves turn.

Walls have no mean part to play in the acoustical properties of rooms. They should always be broken with slightly projecting pilasters or shallow recesses. In theatres it is advisable to draw in the walls at the boxes at an angle of, say, 45 deg. or even longer; this contraction at the proscenium, together with the sloping ceiling, gives the interior a speaking-trumpet or funnel shape, which is extremely easy to speak in. Like the expansion of the circles produced on still water by the dropping of a pebble, so also do sound waves expand as they recede from the speaker. In addition to this all air-space is cut off where it is not required and where lines of sight die out; the less air to be set in motion, the easier it must be on the speaker.

Galleries are never good when of excessive projection; the greater the projection the higher they should be. The ceiling underneath and the floor below should on section be shaped like a wedge, not generally as is the case, small end out and big end in, but with wide end out and narrow end in, thus counteracting the absorption of sound by the soft clothing of the audience and the gradual lessening of power in the sound as it recedes from its source. Besides, this shape is a great gain in structural strength, the only objection being, of course, ventilation, which is extremely hard to perfect in this construction, especially if the gallery be low.

The proper location for the choir in non-ritualistic churches is hard to arrive at and varies with whims of the proprietors altogether too much. In front and below the preacher is not admissible for several reasons. They should not be behind him and on nearly the same level, for a great deal of effect is lost from the discourse by the preacher being surrounded by a halo of beaming femininity; therefore I incline to believe that a choir is better when raised up above the speaker's head and placed in a groined recess. This form raises up the volume of choir sound above the heads of the congregation, and there being a recess, the tendency would be for the sound to travel in a greater volume and farther ahead.

In designing ritualistic churches care should be taken that the chancel arch does not project more than a few inches on each side of the walls on the chancel side. If the chancel width be contracted very much at this point, the sound therefrom will be greatly muffled and appear flat and dead.

The orchestra in theatres should receive careful consideration. Around it resonant materials should be used, and the shape must be such that the sound will be directed up and out over the audience.

All buildings present obstacles and auxiliaries to the passage of sound, and the direction of it properly over the audience. In designing auxiliaries can often be introduced, but as they are of doubtful result—doubt not only as to their proper working, but that they will not prove formidable obstructions—it is advisable to discard all experiments thereon and confine our attention to the elimination of as many obstacles as possible.

A great deal might be said about what materials are best to use on the surface of our work and what are not. Thin pine boards in long lengths are exceedingly good; or in plaster-work I know of nothing better than "adamant," on account of its extreme hardness and uniform elasticity. Any soft covering is never good, as it deadens sound by absorption. Walls and ceilings vibrate in unison with the vocal chords of the speaker, and any lining which is resonant and elastic enough to keep up a sympathetic vibration throughout the entire wall or ceiling length is only admissible for use, preference being given to such materials as are capable of sustaining or augmenting the vibrations. Again, in rooms where an echo is perceptible while the room contains its full capacity of auditors, a judicious use of drapery or curtains will generally remove it. If these be not admissible, then some soft surface covering over that part or surface which causes the trouble will have the desired effect.

In rooms where the acoustical properties are poor, to improve them resonant materials for walls and ceilings are usually good in result; often only a sounding-board behind and above the speaker will have the desired effect, or it may be necessary to change the shape and contour of the walls and ceiling.

THE PORTRANE ASYLUM.

THE following memorial of Mr. Kaye Parry has been addressed to the Council of the Royal Institute of the Architects of Ireland:—

The Memorial of W. Kaye Parry, M.A., F.R.I.A.I., Architect, of No. 35 Dame Street, Dublin.

Saith:—I. In common with fifteen other architects in Dublin, I, on or about the 12th day of August, 1894, received a letter from the Board of Control of Lunatic Asylums in Ireland, asking me to prepare and forward designs and estimates for a lunatic asylum, to be erected and built at Portrane, in accordance with certain printed conditions contained in said letter, and a blue book of "Suggestions and Instructions," which accompanied said letter, and it was therein stated that all said conditions would be rigidly adhered to and enforced. I refer to a copy of said letter, and the "Suggestions and Instructions" and conditions mentioned.

2. Pursuant to said letter and conditions, to which I agreed by letter dated 13th August, 1894, addressed to the Board of Control of Lunatic Asylums in Ireland, I, at great expense, prepared designs and estimates, to which I devoted considerable time and labour, and these designs and estimates were duly forwarded by me to the Board of Control on the 31st of December, 1894. My motto was "Mens Sana."

3. Some day prior to January 12, 1895, all said designs and estimates were submitted by the Board of Control to a committee of selection, consisting of—

- (1) George T. Hine, architect, F.R.I.B.A., London.
- (2) Sydney Mitchell, architect, Edinburgh.
- (3) Dr. James M. Moody, medical superintendent, London County Asylum, Cane Hill, Surrey.

And the function of this committee (as per the conditions) was "to select from the designs sent in to any number not exceeding three which they consider of merit, placing them in the order of merit;" and it was a condition that certain specified prizes, namely, 100*l.*, 75*l.* and 50*l.*, would be given for the designs placed first, second and third respectively by the assessors, while the authors of all other designs should each be paid 35 guineas, but the "premiated designs" were to become the absolute property of the Board, who reserved to themselves the right to adopt any of them or none at their discretion.

4. After the report of the committee of selection hereinafter referred to had been received by the Board of Control (but prior to any adjudication thereon), namely on January 12, 1895, I received notice from the Board of Control that all designs sent in would be on public exhibition at the Royal University, from January 15 to 18, 1895, and said exhibition duly took place and was open to all. I am informed and believe that during and after the exhibition the names of the competitors and their particular designs were well known and freely canvassed. I submit that no exhibition should have taken place until "after adjudication" by terms of the conditions. I refer to a copy of said above-mentioned notice.

5. On January 28, 1895, I received a letter from the Board of Control, dated January 26, informing me that three designs, of which mine was one, had been selected by the committee of selection, who bracketed them together as possessing "equal merit," and I refer to a copy of said letter. But, contrary to the conditions, the committee seem in framing their report to have entirely ignored the question of the sufficiency or otherwise of the estimates of the competitors or "excess of cost," and said report contains no reference whatsoever thereto. Subsequently said three designs were, as I am informed, submitted to a local firm of surveyors, who were asked to report on the cost of the buildings, and at this time the names of the authors of the selected designs had been published in the daily papers, having appeared on January 24, 1895.

6. The surveyors' report was received by the Board on or about February 7, and was thereupon forwarded, together with the report of the committee of selection, to the Board of Governors of the Richmond Lunatic Asylum for the purpose, as it would appear, of ascertaining their views on the three selected designs. I submit that this proceeding was distinctly at variance with the spirit of the competition and the express letter of the conditions, as the competitors were not informed at any time that the Richmond Board would be so referred to at all, and, in addition, the identity of the competitors was then known.

7. The result of the reference in the preceding paragraph mentioned was, as I submit, the practical transference of the final decision to the Richmond Board instead of the Board of Control, the former Board being unable to bring any technical knowledge to bear on the designs, and thereby introducing into the competition a most objectionable personal element, as the authors of the designs were then known. The Richmond Board reported in favour of one design entitled "Aspect," and that the most costly of the three selected designs, notwithstanding the fact that "material excess of cost beyond the necessary outlay" was laid down in the conditions as a ground for disqualification, and one of the "chief points" enjoined on competitors was "economy of construction" and "economy of working supervision and future extension."

8. On March 7, 1895, I wrote to the Board of Control asking them to take steps to have my design placed in order of merit, pursuant to the conditions already quoted before any decision was arrived at, but beyond a formal acknowledgment, I never received any definite reply from the Board. Again, on March 21, I instructed my solicitors to write to the Board on the same subject, and they too merely received a formal acknowledgment to their letter of that date. I say that my design was never placed in its proper order of merit, as stipulated. I refer to copies of the letters above-mentioned as containing the grounds on which I then relied as entitling me to have my design placed in order of merit.

I submit that I am and was entitled to have my design placed in its proper order of merit; and this before my identity was revealed or any decision had been come to by the Board of Control.

9. On March 21, 1895, I received a letter from the Board of Control, informing me that the design "Aspect" (namely, that which the Richmond Board approved) had been accepted for the proposed works at Portrane, and that the total prize money of 225*l.* mentioned in the conditions would be divided among the three selected competitors equally, giving them each 75*l.* (save the successful competitor, whose prize would merge in his fees), the result being equivalent to a second prize to each. I submit that the three selected designs being bracketed by the committee of selection as equal, fairly entitles each of the authors (under the conditions) to a first prize, viz. 100*l.*

10. In the *Irish Times* issue of March 25, 1895 (to a copy of which I refer), an article appeared in which the circumstances attending the contest were reviewed, and it there appears that the author of the successful design was permitted to alter and amend his design so substantially and materially that the surveyor's estimated cost thereof was reduced by 40,000*l.*, or alternatively, by some very considerable sum, but a like privilege was not extended to the authors of the other selected designs, though these were pronounced of equal merit with the successful design. I submit that this procedure on the part of the Board of Control was irregular, and a breach of the meaning attached to the conditions by the competing professionals.

Your petitioner prays that the Council will take the facts and documents mentioned in the foregoing memorial into their careful consideration, and reply to the following queries for the information and guidance of the memorialist and the profession of architects generally, as involving matters of grave professional importance.

Replies of the Royal Institute of Architects, Ireland, to the Questions contained in this Memorial.

Q. 1. Were the assessors justified under the conditions of the competition in bracketing the three selected designs, instead of placing them first, second and third respectively?

A. No. We do not consider this was an adjudication in the terms of the conditions.

Q. 2. Should the competitors' estimates have been examined and checked by the committee of selection before reporting? And was the omission to do so a material irregularity?

A. Yes. Yes.

Q. 3. Were the Board of Control justified in accepting or in any measure acting on the report of the assessors under the circumstances, or should they have referred the report back to the assessors, and requested them to examine the estimates and place the selected designs in their proper order of merit?

A. No. Yes.

Q. 4. Was it in accordance with the spirit of the conditions, that the estimates should be examined and checked by a firm of surveyors, instead of by the committee of selection, and if this examination was admissible, should it have been made after, instead of before, the names of the authors had been made public?

A. No. Checking of estimates is an essential and indispensable element in adjudication by them. It would be, of course, open to the Board of Control to refer to surveyors for confirmatory estimates after adjudication by assessors. Examination should have been made after the names of authors were made public.

Q. 5. Are the authors of the selected designs under the conditions each entitled to 100*l.*, the value of the first prize?

A. (See reply No. 1.) There being no adjudication, according to the terms of the conditions it would be impossible to answer this query.

Q. 6. Was the reference by the Board of Control to the Board of Governors of the Richmond Asylum consistent with the spirit of the competition and with the conditions—whether it influenced the ultimate and formal decision of the Board of Control or not?

A. It was not consistent with the conditions as they must have been unequivocally understood by the competitors accepting competition.

Q. 7. Was it in accordance with the conditions that a public exhibition of the plans should be held before the sealed envelope containing the award of the assessors and the envelopes containing the names of the competitors had been opened, seeing that these conditions stated that the exhibition, if any, should take place "after adjudication?"

A. The exhibition should not have taken place until after the envelopes containing the names of the competitors had been opened and the final decision of the Board of Control known.

Q. 8. Was it right or just under the conditions, and in view of the general rules which govern competitions of the kind, that the author of one of the three selected designs should be afforded an opportunity of substantially amending his design, whilst no such opportunity was extended to the other authors of designs stated by the assessors to be of "equal merit?"

A. No opportunity to amend his design should have been afforded to any one of the competitors until after the final decision of the Board of Control, unless similar opportunities were afforded to the authors of the other premiated designs.

(Signed) THOMAS DREW, Esq., F.R.I.B.A., President.
ALBERT E. MURRAY, F.R.I.B.A., Hon. Sec.

37 Dawson Street, Dublin: April 4, 1895.

(Signed) W. KAYE PARRY,
35 Dame Street, Dublin: March 30, 1895.

Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

THE FIRE OF LONDON.

THE following account of this occurrence was found among the papers of Dr. Worthington, who was master of Trinity College, Cambridge, during Cromwell's protectorate. On September 2, 1666, he wrote to one of his friends (MS. Harl. 7045):—"I preached at Benet Fynk in the forenoon on Matt. v. 3. There was no sermon in the afternoon. A great confusion in the City by reason of a dreadful fire, which began in Pudding Lane. On Monday night, or Tuesday morning, it burned down our church and went through the parish, not leaving an house."

A few days after Dr. Worthington addressed the following letter to another friend, Dr. Evans:—

September 11, 1666.

My time is but short in these parts; I am now preparing for my removal into my northern solitude. God hath discharged me from any further employment in London, where I have

preached for some time, and (through his goodness) not without some fruit. Some of all persuasions, and that had wandered through all forms, placing the kingdom of God in opinions and exterior essentials, have been awakened to other thoughts and received settlement in better things, as I have received it from them and others. A serious auditory of many persons engaged me to hold the place longer than I should. For as for the incomes from the place, they were not so much as they should have been; and the whole was no superfluity, if it had been received. Yet do I not the less thank you for the place; I know you could have been glad it had been more. By reason of this dreadful fire, the church, the house, and the whole parish is consumed, and the people scattered (every one shifting for himself), so that I shall lose, in what was due, for the two years I preached there, and would have been due at Michaelmas, at least 90% (as I have computed the particulars), which though it make no great report and sound in the ears of the great and rich to abundance, yet it is as much to me as their thousands to some; nor could I have held out so long had I not been helped by a little I have—which is little enough for a family of eight persons. By reason of the fire's coming on so suddenly, and the great confusion of such a time, I lost several goods in the house. Some I forgot in this distraction, and some I had not time to remove, having none to help me but one maid. My wife was not well, and others in the family were to be tended, not being well, so that I had not the hands and help which else I might have had. Some trunks that I removed had like to be lost in the streets; they were thrown down and trampled in the dirt, and were given for lost, but at last very hardly recovered. The best of my trunks was given to the flames. It stood in a corner and out of sight, and some things of a far better value than we carried away were also lost and consumed. Next to the danger of the fire was the confusion in the streets, in ours especially (being a great thoroughfare), so that to me it was a wonder that many were not crowded to death or trampled and crushed in pieces by the carts and horses. Several lost their goods after they were carried out, losing the porters in the crowd. Sometimes I have seen places in the streets all strewn with feathers, which might be the destruction of beds. One burden which I sent I thought had been lost, the porter not appearing of a long time; and one porter that carried away a chest for me, finding it heavy, left it in the streets in a corner, and we saw him no more, but happily got our chest again. Some porters would go away after the first carriage and then we were to seek new ones. It is impossible for any man that was not an eye-witness to express, or for the absent to imagine, the dreadfulness of this conflagration, the confusion in the streets and at the gates (where people were forced to stay an incredible time to get through with their burden), the consternation and amazement of men's minds. Every one is now ready to say that they might have preserved more of their goods, or secured more houses from the fire; but at that time their reason and dexterity was half taken from them that they rather gazed upon the flames, and went about their business in a hurry, than acted rationally. I stayed as long as I could in the house, and, night coming on, I was fain to go to Hackney. Many are quite undone, others almost. Bee hath lost 6,000 lib., some say 10,000 lib. Other booksellers 4,000 lib., or 2,000 lib. Dr. Bates hath lost 2,000 lib. in books. Dr. Tackerey's library, in Scriveners' Hall, was burned. Sion College destroyed, and many of the books. Gresham College was preserved by the activity and bounty of some in it, and the fire was stopped in Broad Street, the Dutch minister's house and Dr. Bolton's house being burnt, but the Dutch church not hurt, and but a little of Dr. Bolton's on the south end. Sir Nath. Bernardiston, in St. Martin's Owtwich parish, by the bounty of his purse, engaged men to work hard, and stopped the fire there, and so it was stopped at Aldersgate and elsewhere. Of ninety-seven parish churches there are but twelve remaining. Of the rest, only the walls or some pieces, and the steeples; if it were not for these, it could not be known where the streets were. Blackfriars Church, that had no steeple, is so buried in the heapes that the old clerk, who hath been there forty years, could not discern where the church stood. The Exchange was gone in less than an hour. I walked over part of the ruined city that I might be the more sensibly affected, as none can be but by seeing it. And I think such a mortifying sight is worth a journey, that men may be the more convinced of the uncertainty and vanity of things below. I was afraid of some severe judgment when I considered that many were not bettered by the former judgment, the Plague of London. God grant that this Fiery Tryal may purge and purify us from our filth and soil. I was with others beginning to put the business of procuring Petitus his MSS. in a probable way, but now there is no moving for the present. I wish I could have done more for the public good of learning and encouragement of worthy, ingenious persons than I have, and am glad that I have done somewhat when I had opportunities. It was a pleasure to me when I was in the university or in London. But I am now taken off from a more

public active life into a more private retired way. On October 2, I intend (God willing) to leave these parts, and after I have ventured my health about Mr. Mede's book and my life in preaching all the plague time, I am where I was when I came hither. I did not expect much, nor am I therefore much disappointed. I have for a long time desired the private retired life for some space, and it may be, God sees it best for one. I wish that those that are well provided and accommodated may improve their opportunities for the promoting and encouraging of what is for the public good, which is their concernment as well as mine. If there be anything that I owe you upon any payment due from Benet Fynk to your society, I desire to know it that I may take order about it, for I would owe nothing to any but love.

THE LANCASHIRE AND CHESHIRE ANTIQUARIAN SOCIETY.

A MEETING of this Society was held at Chetham College, Manchester, on Monday night. Mr. J. Holme Nicholson presided. The principal paper of the evening was by Lieutenant-Colonel Fishwick, who gave an interesting account of Tim Bobbin's paper war with John Whittaker, the Manchester historian. Colonel Fishwick showed that while Collier duly acknowledged the value of some of Whittaker's work, he felt himself justified in ridiculing not a few of the writer's theories. The plain common sense of the critic was strong enough to demolish a considerable number of the learned doctor's castles in the air. Colonel Fishwick thought Collier was fully justified in the somewhat severe criticisms he delivered on the subject, and said it was to the credit of the humble schoolmaster that he so readily discovered the weak places in a work which at the time it was published was no doubt considered a masterpiece of erudition. Collier was master of the situation on many points. Modern research had proved him to be right and Whittaker to be wrong. In the course of his paper Colonel Fishwick referred to the supposed Roman road over Blackstone Edge, and said it was a significant thing that Collier, who lived within a short distance of the locality, should have said that there never was the least vestige of a Roman road there, and that there was no probability of there having been such a road. A question thus arose as to whether the road that was now supposed to be a Roman road was then completely covered over, for if the road was exposed Collier must have seen it, and he was far too honest a controversialist to have ignored its existence. Or was it possible that the road was then used for some purpose which to Collier's mind made it clear that it was not a Roman road?

THE SOHO FOUNDRY.

THE fame and fortunes of Soho, says the *Birmingham Daily Post*, have been the wonder of the world for more than a hundred years, and the names of Boulton, Watt and Murdock have become honoured memories through the engineering world. The *edax rerum* has triumphed at last, and in a few months longer the sites will be lost for ever. The Soho House, where Matthew Boulton lived, with lavish courtesies to all the famous people of the last century, still remains as a School of Art. The old Soho Works, so well known, and so famous as "the toyshop of Europe," and the development of the vast houses of steam-power, the rare and graceful products of skill and fashion for all parts of the world, the huge and busy workshops which were the "sights of Soho," and the admiration of all who saw them, secured for Soho unrivalled fame. Half a century ago the times and fashions had changed, and in 1850 the works were slowly dismantled, and scarcely a relic now remains. The "Old Pool" was drained, the picturesque trees which surrounded the works were felled, the vast manufactory, which had been growing for nearly a hundred years, with the fine and handsome Soho House, was rapidly surrounded by the modern builder, and the eight various branches of industry—"Buttons in general, buckles and latches, silver and plated goods, medals and rolled metals, mint for Government coin, mercantile trade, ironfoundry and steam engines and letter-copying machines"—the pleasant views and the keepers' cottages were doomed and lost for ever, leaving scarcely "a wrack behind." One portion of the works which had been added by Boulton in 1775 and completed in 1776 was, however, an important establishment, although at a considerable distance from Soho. It was provided partly as a relief from the crowded workshops in the original building on Soho Hill and over the Great Pool, and partly for the manufacture and finishing of heavy work and machinery, for boring, drilling, lathes, cylinders, and especially for foundry-work, which was developed and increased partly by Matthew Boulton, and in later years by the genius and industry and skill of William Murdock in 1809, when solid cylinders were

bored, special slide-valves invented, oscillating engines perfected, models of locomotives made, gas-lighting purified and perfected, and the area and powers of the foundry were marvellously improved. In 1850, when Soho was dismantled and broken up and sold, the coinage was removed to the foundry and continued and extended with marvellous skill and success, especially in the bronze coinage, which has never needed alteration or correction, and which produced enormous quantities of the familiar coins. Matthew Boulton, himself not merely an able business man, but an able mechanician, designed all his presses and dies, and his work has remained unchanged and unchallenged down to our own times.

The Soho Foundry of 1776 was the scene of a very remarkable "Rearing Feast" on December 30, when it was formally dedicated by the "princely Boulton," and the workmen were regaled in good old English style and in a curiously classic form. The address of Mr. Boulton, sen., upon entering the foundry was in the following terms:—"I could not deny myself the satisfaction of wishing you a happy and joyous day, and expressing my regard for all good, honest and faithful workmen, whom I have always considered as classed with my best friends. I come now as the father of Soho to consecrate this place as one of its branches; I come also to give it a name and my benediction. I will therefore proceed to purify the walls of it by the sprinkling of wine, and in the name of Vulcan and all the gods and goddesses of fire and water I pronounce the name of it Soho Foundry. May that name endure for ever and ever, and let all the people say amen, amen. This temple now having a name, I will propose that every man shall fill his pitcher and drink success to Soho Foundry." Mr. Boulton then proceeded to give the establishment his benediction:—"May this establishment be ever prosperous, may no misfortune ever happen to it, may it give birth to many useful arts and inventions, may it prove beneficial to mankind and yield comfort and happiness to all who may be employed in it. As the smith cannot do without his striker, so neither can the master do without his workman. Let each perform his part well and do their duty in that state to which it has pleased God to call them, and this they will find to be the true rational ground of equality. One serious word more and then I have done. I cannot let pass this day of festivity without observing that these large piles of building have been erected in a short time in the most inclement season of this year, without the loss of one life or any material accident. Therefore let us offer up our grateful thanks to the Divine Protector of all things, without whose permission not a sparrow falleth to the ground. Let us chant hallelujahs in our hearts for these blessings, and with our voices, like loyal subjects, say, 'God save great George our King.'" Alas for all human hopes. The Soho Foundry, after its long and honourable career and services, will soon be known no more. Its famous record and its very site, perhaps, will be forgotten. A series of misfortunes has led to difficulties; the gates have been closed, and the great engines and tools, which have won so many prizes, will soon be scattered.

Fortunately, however, there are some relics of great interest, and even of historic value. The machinery may be removed and disposed of, but the records remain. These include nearly all the books, drawings and plans which have been preserved for nearly a century and a half; the books of letters, wages and drawings have, happily, been preserved, and form an unrivalled mass of facts relating to the founding, development and growth of one of the largest and most interesting departments of a great and famous industrial enterprise for more than a hundred years. Excepting the Plantin Museum at Antwerp, where a printing office of the sixteenth century has been preserved intact, with its presses and types, and where even stray "proofs" have been kept, there is probably no other record so extensive as the relics of the Soho Foundry to be found anywhere. The drawings and papers include the growth and progress of all kinds of work, the history of the steam-engine, the development of gas-lighting, the growth of nearly all the great industries of Soho. In many cases the details of wages, the costs of materials, estimates, &c., are preserved. The letters, not only of Boulton and Watt to each other, but those of Murdock, Creighton, Southern and Buckle, the famous "Soho" men, almost innumerable letters from the most eminent scientific men of the past eighty to one hundred years, number, all told, about 15,000. All of these are full of interest, and have great historic value. Many of the minor inventions, as models, of Watt and Murdock, have been carefully preserved and endorsed; and rare engravings, the original etters patent, and daily records and incidents of scientific value have happily been saved from loss. Most of these have been unseen and unknown, and might readily have been lost, but some years ago the manager (Mr. W. Henry Darlington) collected and arranged the mass of papers, drawings and relics, and placed them in a special room, where they were overhauled and preserved—a record-room which is unrivalled, and which will be found to be not merely curious, but a unique summary of industrial history and of national progress. Mr. George Tangye has generously and thoughtfully, with considerable

difficulty, succeeded in securing this unique collection intact. It was feared that some American millionaire might buy the whole collection, or that it might be removed elsewhere, but it is now placed safely in the Cornwall Works, and will be carefully arranged and described; and, in addition, Mr. Tangye has had a series of photographs taken of the most important parts of the once-famous works.

GENERAL.

Mr. William D. Caroe, who is a younger son of the Danish Consul of Liverpool, has been appointed architect to the Ecclesiastical Commissioners, in succession to the late Mr. Ewan Christian.

Sir George Scharf, K.C.B., has been appointed a trustee of the National Portrait Gallery.

The Council of the Royal Society of Painter-Etchers have elected the following Associates Fellows of the Society:—D. Y. Cameron, J. Finnie, O. Hall, J. Knight, R.I., A. Legros.

The Visitors to the New South Wales National Gallery during 1894 numbered 273,757, or an average of 750 daily.

Mr. W. Bindloss, who was mayor of Kendal, has bequeathed 3,000*l.* to provide a chime of bells for the new Kendal Town Hall, 10,000*l.* for the purchase and conversion of his hospital at Milnthorpe into a block of almshouses, 30,000*l.* for the extension and improvement of the Kendal water-supply, with his family residence, surrounding land, out-buildings and farm adjoining, for the maintenance of the Kendal Town Hall.

Mr. James Price, who was formerly chief engineer to the Midland Great Western Railway Company, died a few days ago at his residence, near Dublin, in his sixty-fourth year.

Mr. Lionel Cust has been appointed director of the National Portrait Gallery in succession to Sir G. Scharf.

Sir Frederic Leighton, P.R.A., will not preside at the Royal Academy banquet next month. According to the *New Budget*, the President has been advised by Sir W. Broadbent that he must at once leave England on a prolonged holiday, and he starts for Gibraltar, his first resting-place. Sir John Millais, R.A., will fill the vacant chair at the banquet.

Mr. J. Vicars, of Sydney, has been appointed city surveyor of Adelaide. There were thirty candidates.

The Improvements Committee of the London County Council have recommended the purchase of the strip of land at the eastern corner of Wellington Street, at its junction with the southern side of the Strand, with a view to increasing the width of the latter thoroughfare at this point from 68 to 80 feet, and thereby affording relief to the traffic. The Duchy of Lancaster have agreed to accept 10,000*l.*, and the National Telephone Company 6,000*l.*, for their interests in the property.

The Roman Villa recently unearthed at the pretty little village of Darenth, in Kent, is attracting a large number of visitors, many of whom are doubtless impelled by pure curiosity alone, but the majority certainly outwardly bear the impression of those learned in antiquarian lore. The nearest station is Farningham Road, on the London, Chatham and Dover Railway, about twenty minutes' distance from the discovered ruins.

The Commission for three figure-windows for Sandon Road Wesleyan church, Birmingham, has been received by Messrs. Swaine, Bourne & Son, Birmingham and London, artists in stained-glass, and will be fixed next month. The same firm executed the large chancel window so highly eulogised by both the press and public last year.

The Annual Meeting of the Leeds and Yorkshire Architectural Society took place on Monday, when the following were elected office-bearers for the session 1895-96:—President, E. J. Dodgshun; vice-presidents, W. Watson (Wakefield), W. Carby Hall; hon. treasurer, William H. Thorp; hon. librarian, W. H. Bevers; hon. secretary, Francis W. Bedford; members of council, W. S. Braithwaite, H. B. Buckley, G. F. Danby, W. A. Hobson, James Ledingham (Bradford), W. C. Williams (Halifax); auditors, H. S. Chorley and L. S. Dodgshun.

Colonel Mitford has given a new altar to Filey Church (of which living he is the patron), in memory of his golden wedding. It is of carved oak, over 8 feet long, the panels of which have been painted by Miss Wheelhouse.

New Hunstanton, Norfolk.—A limited competition for the District Council Buildings for this place has just been decided, the plans of Messrs. George J. & F. W. Skipper, architects, of Norwich, being unanimously selected. Four other architects (all of London) were invited to submit plans. The amount to be expended is 2,000*l.*

The Architect.

THE WEEK.

A GREAT painter who was never sufficiently appreciated by his countrymen was PAUL CHENAVARD, who died last week in Lyons. He was born in 1808, and was therefore one of the few survivors who could recall the contests between the champions of Romanticism and Classicism. As a pupil of INGRES he belonged to the latter side, and, like his master, CHENAVARD attached more importance to careful drawing than is now thought to be advantageous. In 1827 he went to Italy. It was the time when the Germans were asserting their power in Rome, to the surprise of the rest of the world. CHENAVARD was brought under their influence, and he aspired to make of his art something more than a gratification for the eyes. Like CORNELIUS, KAULBACH and OVERBECK, he wished to have painting a rival of literature. Accordingly, when he returned to Paris in 1830 he commenced the preparation for a great series which would exemplify the *History of Humanity*. He devoted himself to his task with a self-sacrifice that corresponded with JAMES BARRY'S when he decorated the room of the Society of Arts. LOUIS PHILIPPE'S Government did not care much about humanity in general, and CHENAVARD received no encouragement. When the Revolution of 1848 succeeded, the painter believed his opportunity had arrived. He obtained a decree by which the Panthéon was assigned to him in order that he might represent the *History of Humanity* around the walls. He was allowed four assistants, artists as enthusiastic as himself; but the pay was more than modest, viz. 10 francs a day. The pictures were to be about 20 feet high. The fall of the Republic was fatal to the scheme. CHENAVARD took home his cartoons, and they remained with him until 1870, when he was persuaded to present them to the Musée of Amiens, which was his native city. They were the great work of his life, and he never cared to undertake (nor, indeed, was he offered such a commission) another enterprise of equal importance.

THE series begins with *The Deluge*, and although wanting in colour, the cartoon indicates the immensity of the desolation. The next is *The Judgment of the Kings of Egypt after their Death*. The *Death of Zoroaster*, an incident in the Eastern contests between the military and sacerdotal castes, shows talent for representing vigorous action. The architectural detail of the temple where the murder takes place may not correspond with modern discoveries, but it has a grandiose effect, and suggests the study which CHENAVARD must have given to building, which at the time was always conventionally treated. His *Trojan War* is one of the noblest of Homeric illustrations. In *The Death of Socrates* the artist avoided competition with DAVID by representing the sage as lying unmoved after drinking the hemlock. The *Age of Augustus* enabled CHENAVARD to represent a scene that was not tragic. He has grouped the celebrities with skill, and in VIRGIL and HORACE, who appear in a prominent place, he has expressed character. In representing a part of the life of CHRIST, CHENAVARD proved his competence to treat the most sacred themes. In the *Catacombs* he has hazarded much by dividing the picture in two, the upper part showing the barbaric treatment of the Christians, while below is seen a group at a love feast awaiting martyrdom. CHENAVARD provokes comparison with RAPHAEL in his *Interview between Pope Leo and Attila*, but he is far more true to history. The *Decameron* is a group in which DANTE and BEATRICE, PETRARCH and LAURA, BOCCACCIO and others are seen in an enchanted garden. In Paris a painter would be obliged to subdue the importance of the event *Luther tearing the Pope's Bull*, and CHENAVARD consequently introduces only a few spectators as witnessing the transaction. More flattering to his countrymen is the *Age of Louis XIV.*, in which the celebrities who gave renown to that time are seen at Versailles. It is the climax of the series. On that account probably neither NAPOLEON III. nor his successors in ruling France were eager to allow CHENAVARD to represent his *History of Humanity* on a more enduring material than sheets of paper.

IN one of the papers read at the last meeting of the London and Middlesex Archæological Society, the Roman remains discovered during the excavations on the site of 62 Threadneedle Street were described by Mr. H. JONES. Sanitarians will be glad to learn that the most interesting object was a bath formed of some kind of cement. Apparently it was intended for family use, since it was too large to be accommodated in the Guildhall Museum or the British Museum. In either institution it would be unique. The bath suffered during the excavations, for labourers could not be expected to imagine that the rough cement they encountered was more than a part of a foundation.

THE new hospital for sick children at Rillbank was described by the architect, Mr. G. WASHINGTON BROWNE, to the members of the Edinburgh Architectural Association on the occasion of a visit on Saturday. He pointed out that the wards ran from east to west in order that they might have as much light and sun as possible. There were four large wards, each with twenty-four beds; one spare ward and small wards for observation and isolation, providing in all for about 120 patients. The nursing staff was larger in a children's hospital than in one for adults, and there it would consist of five sisters, twenty-one day nurses and eight night nurses. With resident doctors, matrons, &c., there would be a medical and nursing staff of forty. A new feature in such buildings was introduced, viz. a play alcove for convalescent children. The kitchen was placed on the top of the house, and for the twelve domestics who would be required there was a servants' hall. The cooking had to be done principally by gas. All through the building the ventilation had to be by natural and not mechanical means, and the heating, in four sections, by low-pressure hot water in coils and pipes. The artificial light was to be electric, and for that they were laying down their own plant, with two boilers, engines and dynamos. Either engine might be driven by either boiler, so that they were safeguarded from a breakdown of the light. About half-past ten o'clock at night the light would come from cumulators, and hence there would be no machinery going at night. In any case, the machinery was away from the building. There would be 404 lamps of 16 and 8 candle-power. They were also laying down their own steam laundry. In showing, on the various floors, how the plans had been realised, Mr. BROWNE drew attention to the absence of ornamental plaster-work, and remarked that the hospital was constructed in a purely utilitarian spirit. It is expected that the premises will be ready for occupation in August.

CARE will have to be taken that the examination of buildings by local authorities does not become a farce. From time to time we hear of proceedings which are not only oppressive but are based on groundless charges. A case of the kind was heard during the week at King's Heath, Birmingham. Messrs. J. H. HALL & Co., builders, of King's Norton, were summoned at the instance of the King's Norton Rural District Council for infringing the by-laws by constructing houses with bricks unfit for use. The surveyor said he inspected the buildings on April 2, and found that the bricks were not good. On the 3rd he took some to the Selly Oak Workhouse, where the District Council were holding a meeting, and the bricks, on being examined, were condemned. For the defence it was said that the case was of considerable importance to builders. The firm who had supplied the bricks were engaged in extensive building operations at Cotteridge, and for the bricks used to be condemned in that wholesale manner was a very serious matter. The manager of the firm who supplied the bricks, Mr. OWEN, architect, and several bricklayers gave evidence to show that the bricks used in the buildings were sound and good. The foreman of the bricklayers said that the samples had been taken from a heap of rejected bricks. The Bench decided to dismiss the case. We suppose all builders are liable to suffer persecution of the kind that was condemned at King's Norton, but should less rashness not inspire the action of the authorities it must be expected that by-laws will be brought into general disrepute, and magistrates will hesitate before they punish manifest breaches of the law.

MEDIÆVAL CONSTRUCTION.*

AS American poets and other writers have regretted that the Pilgrim Fathers did not bring some English ghosts with them to confer a little romance on the new settlements, we suppose many American architects have often desired the possession of a few Gothic cathedrals and churches. An art like architecture, which depends so much on precedent, cannot expect to thrive where no precedents are visible. In England or France, if there is a doubt about a question of Mediæval detail, it is not difficult to solve it in the most convincing way by examining genuine examples. An American architect would be compelled to depend on the authority of some witness. A case of the kind is exemplified by the volume before us. Mr. Huss explains its origin when he says:—"While preparing drawings for a large cathedral church in New York city the article 'Construction' of the 'Dictionnaire Raisonné' was freely used, and then the idea was conceived of translating it into English." It would be an advantage if many, if not all, of VIOLLET-LE-DUC's articles could appear in an English form. The volumes of his "Dictionnaire" are supposed to be indispensable in every architect's library. But the use made of them by the majority of the possessors depends mainly on the woodcuts, which may be said to speak a language which is intelligible to architects of every land. The text is rarely studied. And yet in such articles as "Construction" we have not only an immense amount of information or facts derived from the study of buildings, but what is more rare in works of an encyclopædical class, much shrewd thought. In gathering up the conclusions from other articles in those summaries the author is not afraid to express his own opinions, however startling or inapposite they may appear. Take one case. It is natural to expect that an enthusiast for Gothic art and an architect who had charge of the conservation of ecclesiastical buildings would hope to see French churches lasting as long as the great globe itself. But VIOLLET-LE-DUC, who might struggle against the effects of time, was assured there was a more potent enemy which no architect or commission for the preservation of historic monuments could resist. In one place we find him saying:—"The cathedral of Noyon has stood for seven centuries, and provided it can be repaired suitably, it can last five hundred years longer; now twelve hundred years appears to us a reasonable duration for a building, *since the great social revolutions to which humanity is subject will destroy them anyhow*, even if they are able to continue for a longer period." In politics he was no less disposed to be wayward. VIOLLET-LE-DUC was one of the hangers-on at the last Imperial Court in France. Yet we find him treating the labour problem in a manner that must have startled the Tuileries, if any of the guests could be supposed to be capable of reading the "Dictionnaire" and reporting the contents. He says, for example:—"Workmanship has declined among us at the periods when men have tried to submit individual labour to diverse Classic rules established by an absolute power. Now when workmanship declines, social crises are never far off in France." And then he goes on to explain how the building trades were a dangerous force. The unlimited Haussmannising in Paris and some of the provincial cities may have been intended to subdue the malcontents.

VIOLLET-LE-DUC could occasionally surprise people, and who knows if he were now alive whether he would recommend the translation of his "Construction" for the use of the American architects who were engaged in the St. John's Cathedral competition? He would uphold what he said about Gothic alone furnishing the "ingenious and practical means of solving the numerous difficulties which surround the constructor living in the midst of a society whose needs are complicated to excess." But he might express a doubt whether nineteenth-century cathedrals, assuming them to be necessary, must have Pointed arches and resemble the buildings which were planned for a different sort of ritual. He would be likely to ask why Americans who had been so

well able to meet novel requirements in engineering construction, and who could span wide rivers and valleys by trusses that were more ingenious and more economical than any devised in Europe, should not be permitted to develop Mediæval construction in the way that seemed to be most rational? What he said about the Carolingian builders is not inapplicable (*mutatis mutandis*) to a time when another transformation has become desirable, and nowhere would there be a more fitting place for a trial than in the youngest of the great capitals of the world, New York:—

The stern necessities by which these first constructors found themselves confronted compelled them to fall back on their own resources in preference to the studies of ancient monuments, which they understood but very imperfectly, and which in the greater part of the Gallic provinces existed only in a state of ruin. Ever ready to imitate foreign works, they submitted these to their own imperfect processes, and in thus transforming them they made them contribute towards a unique art in which reason prevailed over tradition. That was a hard school; resting with uncertainty upon the past, finding itself confronted by the needs of a civilisation when everything had to be created, possessing but the elements of the exact sciences, it had no guide other than experiments; but this method, if not the quickest, had, at least, the advantage of making practical observers, who were careful to collect all the improvements which could help them.

In an age when the methods of science are brought nearer to perfection, it might be supposed that something more is feasible than was accomplished by the Carolingians and their successors during the succeeding centuries. As long, of course, as certain forms are held to be sacred, it is dangerous to depart from them. With VIOLLET-LE-DUC, however, form was considered to be of less importance than constructive methods, and it should always become subservient to necessity. When speaking of the courageous attempts of the old builders, and their defiance of anything like academic conservatism, he says:—"Construction was not for them, that science which consists in saying, 'Here are the rules, here are the examples, follow them out, do not go beyond them.' On the contrary, science for them said:—"These are the general principles; they are broad, they indicate nothing but methods. In their application, extend them as much as the material and your experience allows you; we ask nothing of you, except to remain faithful to those general principles; moreover, everything is possible to him who knows how to apply them." It would be pardonable if the Mediæval monks were satisfied with their early efforts to solve the problems of construction. Nor could it be expected that they would be zealous in meeting all the claims of secular clients. It was the opinion of VIOLLET-LE-DUC that before the end of the twelfth century the majority of architects were laymen. One of his reasons is the absence of praise of the builders and buildings in the monastic chronicles. The churches of the Romanesque period form the subjects of many laudatory notices, but the annalists become abruptly silent at the end of the twelfth century, when architecture passed from the cloisters into the hands of the laity; perchance there is a word about the edifice—a phrase dry and laconic—but as to the masters of the work nothing. In the voluminous records of the church of Notre-Dame at Paris, which contains documents dating back to the twelfth century, not a single word is said about the construction of the present cathedral. But in the earlier days when experiment was more difficult, without the religious bodies architecture might have remained for a much longer period in its trance. It was the monks who awakened the sleeping art and fostered architecture until it had regained some of its earlier strength. Many people will suppose that their care was selfish, a grasping after power, a superseding of the more competent laymen; but, as VIOLLET-LE-DUC explains, individual laymen could not prevail when architecture needed most care:—

The religious orders were the first who could by themselves undertake important building. First, because they could assemble at one place a number of workmen sufficiently united by a single thought, subject to discipline, freed from military service, possessors of the land on which they lived. Secondly, because they amassed property which grew rapidly under a regular administration; because they joined in amicable intercourse with neighbouring establishments, because they ploughed up and rendered wholesome uncultivated lands, laid out roads, acquired by gift or purchase the richest quarries, the best woods, built workshops, offered to the peasants guarantees relatively certain, and peopled their lands thus rapidly to the detriment of those of the lay nobility. Thirdly, because they were able, thanks to their privileges and the comparative stability of their institutions, to form with their monasteries schools of artisans, subject to a regular ap-

* *Rational Building.* A Translation of the Article "Construction" in the *Dictionnaire Raisonné de l'Architecture Française* of M. Eugène-Emmanuel Viollet-le-Duc, by George Martin Huss, Architect. New York and London: Macmillan & Co.

prenticeship, clothed, fed, maintained, working under the same direction, preserving traditions and recording improvements. Fourthly, because they alone, at that time, extended their influence to a distance, in founding establishments subject to the mother abbey; because thus they continued to profit by all the partial efforts that were made in countries very diverse in climate, manners and customs. It is to the activity of the religious orders that the art of construction owes its rise from barbarism to the eleventh century. The Order of Cluny as the most important, the most powerful and most enlightened, was the first which had a school of architects, whose new principles were to produce in the twelfth century monuments freed from the last Roman traditions.

It might also have been added that the ecclesiastics had preserved the tradition of the art as it was recorded in copies of VITRUVIUS. There is a remarkable instance in the correspondence of EGINHARD, who was the friend and it may have been the son-in-law of CHARLEMAGNE. Afterwards he became a priest. In a letter to his son VUSSIN he says that he sends with it lists of obscure words and phrases which he collected from VITRUVIUS in order that VUSSIN may help him with an explanation of them. The letter reveals that a busy man like EGINHARD, who was engaged in the affairs of the empire as well as in building churches and collecting relics, could occupy himself with the ancient treatise on architecture, and would not skip difficulties without an effort to understand their meaning. It also shows that owing to the progress of learning the succeeding generation possessed an increased power of interpretation. That was not attained by the comparison of texts alone, for EGINHARD tells his son of the aid he may obtain towards a solution of the difficulties by an examination of a certain coffer with columns of ivory, which was made in imitation of an antique monument. VIOLETTE-LE-DUC says that CHARLEMAGNE could not obtain architects from Rome, but from EGINHARD's letter it is evident that models of Classic buildings were available for builders. We also know from the Emperor's will that he possessed a silver table which he prized, for on it a view of Rome was delineated.

Models and views could be only incentives to exertion. Constructive difficulties must be overcome by the patient toil of the builders. Neither models nor views were likely to be correct, but it is not unreasonable to suppose they suggested the prevalence of vaulting in the Roman buildings, and the conclusion would then be drawn that every important building and especially churches must be vaulted. The basilican churches in Rome, it is true, were covered in a different way, but they could only be taken as mere interim structures. The region of Europe in which the attempts were made to revive dome construction was very wide. As E. A. FREEMAN says:—"The ducal chapel of Venice repeats the patriarchal church of Constantinople, as it is itself repeated in the far-distant abbey of Périgueux." The number of failures that occurred may have been incredible, for we cannot suppose that the Romanesque builders of the eleventh century were moved by any sudden or novel inspiration. Development generally moves like a stream, at one time sluggishly, at another time quickly, but whatever the rate the motion was continuous. There was a necessity for improvement in roofing. To the Christians a vaulted roof may have been typical of heaven, especially when they heard the words "sursum corda." It was certainly more dignified than a flat surface. What was most needed was, however, the nearest approach to uninterrupted space. Waggon vaults were inadequate for roofing, for with them there must be either a very limited width for churches or longitudinal division walls, which would be obstacles to seeing and hearing. The aim of the clergy was to unite the people as one body, which was not possible so long as they were separated by walls or large piers. The whole problem was the covering of space while employing only a few points of support. The Roman vault was adapted only for spaces that were square, but, says VIOLETTE-LE-DUC, "during the eleventh century the builders had constructed vaults which partook of both the dome and the ground vault, in that these vaults, instead of being formed by the intersection of two cylinders at right angles, are produced by four semicircular arches joining the two piers, and two diagonal arches which are themselves semicircular, and hence present a longer radius than those of the first four." When after long years of groping that mode of covering a space was found practicable, which differed both from the ancient

Roman and the Périgueux methods, a new era in construction had opened. The roof assumed due importance, for its arrangement became one of the first thoughts of the architect when planning. That may now seem strange, for there are many facilities for constructing roofs of enormous span. But the Mediæval builders were compelled to depend on their masonry, for they could not form a framework of iron which in secret would oppose all that might lead to rupture.

When the start was made progress became comparatively easy. The new vaulting made Romanesque forms appear out of keeping, and as a consequence what we call Gothic was perfected. The architects were ambitious to amaze the world and endeavoured to make it appear more and more puzzling how their buildings were sustained. The flying buttress was one of their expedients. VIOLETTE-LE-DUC maintains that the adoption by the builders of the flying buttress, which led to so many collapses, at the end of the twelfth century was a despairing act, "since they were seeking to avoid it as far as possible, and since they distrusted this means whose advantages and power they were not yet able to appreciate, and that they regarded it only as an auxiliary, a last resort, often an afterthought, and when they had learned that they could not do without it." He has to admit that in such a case as the choir of Beauvais Cathedral there is inherent weakness, for "that outer scaffolding of stone which forms the whole strength of the building is subjected to the action of the atmosphere; it seems as if the builder, instead of trying to protect the vital parts of his structure, had taken pleasure in exposing them to all the chances of destruction." But VIOLETTE-LE-DUC cannot refrain from expressing his admiration of the experiment. It is on a par with the charge which was magnificent but not war, with the brilliant surgical operations which only gave pain to the patients. If masons' bills need not be paid, if clients' interests could be ignored, a repetition of the fine feats at Beauvais would be entertaining, but under the modern system of debit and credit they can hardly be considered as building in the accepted sense of the word, for it does not signify expending money to insure a collapse.

In many other cases a collapse was avoided by the employment of safeguards that are analogous to the veiled girders and rolled joists of our time. How many admirers of the exquisite little Sainte-Chapelle in Paris are aware that every course from base to summit was secured by iron fastenings? All the parts of Notre-Dame in Paris which are later than the early part of the thirteenth century, or which were repaired, are also fastened by iron cramps set in lead. In such cases the Mediæval builders have obtained a reputation for daring under false pretences. They were not able to devise the parts of their buildings so that only direct compression would result, for, says VIOLETTE-LE-DUC, "the way in which these anchorages are arranged shows, moreover, that what they feared most was the bending or twisting of the piers and walls." English Mediæval buildings can also present similar examples of precaution against the contingencies that arise out of courageous construction, and the neglect of the maxim about the necessity of building stronger than strong enough.

When Gothic began it was a mason's style, and many a building must have been erected for which there were no drawings except what might be made with chalk on a board. In the days when it attained most *éclat* and unsafeness it had become a draughtsman's or a geometrician's style, which would still have interest if the work never advanced beyond the paper stage. The sketch-book of VILLARD DE HONNECOURT suggests that friends like himself and PIERRE DE CORBIE could amuse themselves in creating novelties of construction which no contractor would care to undertake to realise at a moderate cost, or unless he was free from liability for accidents. We may suppose that many other educated gentlemen in the time of St. Louis found pleasure in similar efforts.

The civil construction of Mediæval times represents different conditions, and another sort of treatment was permitted. The churches were governed by the necessities of the covering, but, as VIOLETTE-LE-DUC says, in other buildings "very rarely, unless it may be in a few towns of the south and centre, the ground-floors were vaulted; consequently there were no buttresses, no projections on the

exterior." Unfortunately, not many examples of Mediæval secular building have survived, and it is therefore safe to assert that they, to a large extent, corresponded with churches. VIOLLET-LE-DUC does not, however, fear to say that "civil and military construction preserved something of Roman art when the last traces of this art had long since been abandoned in religious architecture. There were, then, two quite distinct modes of building, dating from the end of the twelfth century, the religious and the civil, and this state of things lasted until toward the middle of the sixteenth century." During that period we have means enough to know that the builders must have been guided by principles, and regarded the nature of the materials they employed as well as the requirements of the occupants of the buildings.

In one part of his article VIOLLET-LE-DUC notices the desire for a new style, which is not yet abandoned. He does not ridicule it, but he says the style is not to be obtained by forbidding the study of that style of architecture which was most supple and free in the use of material means. Whether the "Dictionnaire" has brought us any nearer to the new style is not apparent, but there can be no doubt that it has revealed the value of Mediæval architecture with a clearness that is without precedent. The article on "Construction," which is one of the most important of all as an exposition of the subject, is masterly, and could only be produced by a man who was fortunate in having constant opportunities not only to study Mediæval architecture as it appeared to the world, but to see within the outer casing and to study the causes of stability and decay. The English translation by Mr. HUSS is therefore an addition to professional treatises which should be prized.

MATTIA PRETI: IL CAVALIERE CALABRESE.

AMONG the Naturalisti of the seventeenth century Mattia Preti was not as renowned as Spagnoletto or Caravaggio or Stanzioni through his paintings, but he gained a notoriety by his adventures, which perhaps was an equivalent. He might have modelled his conduct after the example set by Benvenuto Cellini, but fewer deaths can be charged to his account. In his wanderings, however, he surpassed Cellini.

Mattia Preti was born in 1613 at Taverna, a small town of Calabria. His genius for painting early developed itself, and at seventeen he went to Rome to join his brother, Gregorio, who at that time was director of the Academy of St. Luke, but whose name has passed into oblivion. From him he received instruction, and was guided in studying the works of the greatest Italian masters and the noblest statues of antiquity. He gained the patronage of Cardinal Rospiglione and of Pope Urban VIII., by whom he was made a knight of the court. While Preti was still undecided about the school he should follow, Guercino's *St. Petronilla* was brought to Rome. This at once decided him, and he immediately set out for Cento, where Guercino resided, and on his arrival was received with much kindness. For many years subsequently to this period Preti devoted himself almost exclusively to the study of design and composition, and did not take the brush in hand until his twenty-sixth year, when he painted a Magdalen in a manner that obtained praise from Guercino.

Preti was the Wandering Jew of painting. He travelled over half of Europe in order to make the acquaintance of the most distinguished painters and to visit the richest galleries, with the view of improving himself in the practice of his art. He journeyed to Parma in order to study the masterpieces of Correggio and to Venice to examine those of Titian, Tintoretto and Paul Veronese. Afterwards he met a Frenchman, who induced him to visit France, where he saw the paintings of Simon Vouet and of Le Brun. He was the most impressed with the pictures which Rubens had painted for the adornment of the Luxembourg. The sight of them determined him to repair to Flanders and make the acquaintance of that artist. On arriving at Antwerp his first care was to seek out the works of Rubens, which he daily visited. On one occasion while he was standing in the cathedral wrapt in admiration, he was accosted by a stranger, who requested his opinion of the painting at which he was gazing. Preti praised it and added that he had come to Antwerp solely for the purpose of making the acquaintance of Rubens and of studying his works. The stranger invited him to his house and they repaired together to a handsome mansion, richly furnished and adorned with noble pictures. But the more these were praised by Preti the more they were depreciated by the unknown. At length an explanation took place and the courteous stranger proved to be Rubens himself, who showed his Italian admirer much

kindness and presented him with a picture of *Herodias with the Head of St. John*. After leaving Antwerp, Mattia travelled through Germany. He was absent from Rome six years, and on his return he continued his studies. His name gradually began to grow famous. For the Pope he painted a *Christ crowned with Thorns* and *Penelope driving her Suitors from the Palace of Ulysses*, which were so highly thought of as to be at first ascribed to the pencil of Guercino. By birth Preti was descended from an ancient and honourable family, and he might consider himself as not unworthy of the honour when the Pope admitted him into the Order of Malta, the ceremony being held in the church of St. Anne in 1642.

The new knight could also claim to be as skilful with the sword as with the pencil. A fencing-master or bravo in the service of the ambassador of the Emperor challenged him to fence. The trial of skill was converted into a duel in presence of the Roman people, and the result was that Preti severely wounded his antagonist. This drew upon him the anger of the ambassador. The Pope, who knew that Preti was in danger of assassination, induced him to leave Rome at night and embark for Malta, at the same furnishing him with recommendations to the Grand Master. At Malta Preti painted the portrait of that dignitary, and a *Decollation of St. John*. His stay in the island was, however, very limited, for a knight of the Order having insulted him by sneering at his nobility, Preti struck him so rudely that he left him half dead. He was condemned to imprisonment for this offence, but saved himself by embarking in a felucca bound for Leghorn. At that seaport he met the Papal nuncio on his way to Spain, and joined his suite. He remained in Spain for some time, and painted several pictures, and, after the death of Urban VIII., returned to Rome along with his patron the nuncio.

There he found Lanfranco and Pietro da Cortona in possession of the popular favour and got little employment, except from the picture-dealers. This compelled him to leave the Eternal City and lead the life of a travelling artist, painting at Bologna, Venice and Florence. After the death of Lanfranco he returned to Rome, where his picture of *Jupiter and Niobe* obtained the prize of the Academy of St. Luke, of which he was soon after elected a member. The decoration of the church of San Andrea della Valle had been left unfinished by Domenichino and Lanfranco, and Preti received the commission to complete it. His pictures, however, contrasted unfavourably with those of the Bolognese artists who had preceded him, and this inferiority was contemptuously alluded to by one of his rivals. This was enough to inflame the hot blood of the Calabrian and a duel was the result, in which Preti dangerously wounded his opponent. To avoid the consequences he fled to Naples, where his adventurous career was nearly brought to a premature and disgraceful close. The plague was then raging and all strangers were prohibited from entering the city upon pain of death. Preti, ignorant of the circumstance, attempted to enter, was rudely opposed by the guards, and a soldier struck him on the cheek. To this insult he replied by a sword thrust, which laid his assailant dead at his feet. He succeeded in disarming a second antagonist, but was at length overpowered by numbers, thrown into prison and condemned to die. But the Viceroy, who knew his merits, interfered to save him, observing, "*Excellens in arte non debet mori*," and imposed upon him as his only punishment the task of painting upon the eight gates of the town the guardian saints of Naples. Preti afterwards became one of the favourite artists of the Neapolitans and obtained many commissions. For one of his patrons he painted a picture of the *Martyrdom of St. Bartholomew*, in which he introduced as one of the executioners a farmer whom he had often seen at the house of his employer. Unfortunately, the countryman recognised his likeness, and was with difficulty prevented from attempting to kill the painter who had taken such an unwarrantable liberty as to represent him engaged in slaying a saint. During his residence at Naples, Preti experienced considerable annoyance from the self-sufficiency and ignorance of some of his patrons. He had been employed by the monks of San Pietro à Mazella to work for their convent, and had established his studio on the pavement of their church, where he was occupied with a series of paintings from the life of St. Catherine of Alexandria, which were ultimately destined to be placed at a great elevation above the eye. When closely examined they appeared of course rough and unfinished, being painted in a free and bold style, calculated for the lofty position which they were intended to occupy. The prior, however, refused to accept what appeared to him to be little better than a set of rude sketches, and insisted upon Preti's refunding the money that had been paid for them. In vain the painter pointed out the reasons for the appearance of the pictures in their present position; the prior was obstinate and would not be convinced, and arbiters were therefore appointed, who pronounced the paintings excellent and ordered them to be placed in their destined position, which was no sooner done than the prior and his monks were compelled to confess their error and acknowledge the skill and forethought of the artist. So well

pleased, indeed, were they with the effect of Preti's pictures when properly placed, that they entreated him to continue his labours, which he was with difficulty persuaded to do. Greater men than Preti have had their works slighted and censured by ignorant pretenders with as little justice. Some time after his dispute with the monks of San Pietro, Preti sailed for Malta, where he was well received by the grand master, De Redin, and employed in executing paintings for the cathedral, which occupied him for thirteen years, and with which the Order were so well satisfied that they made him commander of Syracuse, and granted him a pension. He subsequently painted a number of pictures for France, Spain, Germany, Flanders, and also for his birthplace, Taverna, where he had endowed a chapel. He laboured constantly in his vocation, but latterly only for the sake of the poor, and on being reproached by a friend with his incessant labours, which were undermining his health, he replied, "What will become of the poor if I don't work?" He who had traversed Europe in pursuit of his art, had undergone dangers innumerable by sea and land, had escaped the attacks of secret enemies and open foes, was at length destined to meet his death from the results of a trifling scratch. His barber happened to cut his chin whilst shaving him, gangrene appeared, and, after suffering for two months, Preti died at Malta in 1699, at the advanced age of eighty-six. He was interred in the cathedral and his body was borne to the grave by the commanders of the Order. In spite of his fiery temper and his readiness to appeal to the sword, Preti appears to have been generally popular and beloved among his contemporaries. He had none of that paltry jealousy that was too common among artists, and especially prominent among the Neapolitan painters of the seventeenth century; and his conversation, enriched and enlivened by extensive reading and travel, is said to have possessed a peculiar charm. His chief merits as a painter consist in his design and composition, which are excellent; in a strong impasto and a vigorous contrast of light and shade, in which he resembles his master Guercino, though his pictures are blacker in the shadows. He is distinguished rather by the force than by the grace and delicacy of his pencil, and his sombre colouring is well suited to the general character of his subjects, which are commonly of a tragical and melancholy description, such as plagues, acts of penitence and martyrdoms. These had been introduced and rendered popular among the Neapolitan artists by their great founder Caravaggio and his successor Spagnoletto, who had treated them with marvellous breadth and power, but sometimes also with a ghastly minuteness of detail, as if they had gloated over the tortures of a martyr. The finest of Preti's works are still to be seen at Malta; but his oil-paintings in Italy and other parts of Europe are almost innumerable, as his long life, constant activity, rapid handling and habit of leaving some memorial of his genius wherever he went, enabled him to execute an incredible number of pictures.

THE LATE ERNEST TURNER.

IN the *Journal of the Sanitary Institute* for April Mr. A. Wynter Blyth offers the following tribute to the memory of Ernest Turner, architect, who died at Tunbridge Wells on March 16, 1895:—He was the third son of the late William Hall Turner, F.R.C.S., L.S.A., surgeon to the Asylum for the Deaf and Dumb, Southwark, and afterwards, of Red Hill, Surrey. Mr. Ernest Turner, born on July 24, 1844, was educated at King's College School, London, and afterwards articled to his cousin, the late Mr. Arthur Newman, architect, also of Southwark. On the expiration of his articles he was for some years assistant to Mr. Bulmer, architect and county surveyor, Maidstone.

On the death of Mr. Bulmer he took an office and commenced practice, first in Verulam Buildings, Gray's Inn, then in Bedford Row, W.C., and lastly in Regent Street. Mr. Turner early turned his attention to practical sanitation, and soon stood foremost among architects in his knowledge of the principles of hygienic construction and their application. One of his early successes was the acceptance, from a crowd of competitors, of his design for the Rotherhithe Sick Asylum. Afterwards he designed the Central London Throat Hospital and the hospital at Teheran, Persia. Besides these large undertakings he designed several steam laundries, such as those at Battersea, Kilburn and Penge, redrained a number of country houses, and also built several schools and private houses.

Mr. Turner's connection with the Sanitary Institute dates from almost its commencement. He attended the first annual meeting in 1876, before the incorporation of the Institute, and has always since that time been a member of its Council. He has filled various honorary posts, as chairman of committees, and a year ago was elected unanimously chairman of Council. In the ordinary course of things, had he lived, he would have been elected for a second year. During his connection with

the Institute no one has devoted himself with greater assiduity to its work; only urgent necessity ever caused his absence from a single meeting. Latterly the duties of chairman of Council have been particularly arduous, and it is to be feared that his strict and conscientious labours were during the past few months in excess of his strength. He presided all through a meeting of Council three days before his death.

Mr. Turner married in 1880 Miss Julia Davis, and the marriage was in every respect a most happy one.

Mr. Turner's extreme amiability of character endeared him to a large circle of friends; the more intimate the knowledge of the man the more there was found to admire. Learned in all matters relating to his own profession, and gifted with great common sense, his opinion was always valued.

To the cause of public health, as embodied in the labours of the Sanitary Institute, the loss is irreparable, and the small society of men on whose shoulders the labour of the work chiefly rests, acutely feel the death of their able and industrious coadjutor.

At a special meeting of Council held on March 20 the following resolution was unanimously passed and forwarded to Mrs. Turner:—"That the Council of the Sanitary Institute have received with profound sorrow intelligence of the death of their chairman, Mr. Ernest Turner, F.R.I.B.A., who was one of the members of the original Council of the Sanitary Institute of Great Britain in 1877, and retained his seat on the Council of the Sanitary Institute up to the time of his death. The Council desire to record their appreciation of his unremitting devotion to the cause of public health, and to the Institute with which he was so long and so prominently connected. The Council would wish to convey to Mrs. Turner and the members of the family their sincere sympathy in the great loss they have sustained."

TEYNHAM CHURCH, KENT.

AT the church of Teynham, Kent, an accident has led to a discovery which is of considerable interest to the antiquary and archæologist. The west door has recently undergone a renovation, and the removal of all superficial covering has disclosed a very fine massive oak door in an admirable state of preservation. The most noticeable feature about the door is that it is scarred in several places with bullet marks. The white paint formerly concealed these marks from view. Now, however, they are to be seen clearly enough. There are eight distinct bullet marks, and in some of the punctures the leaden bullets still remain embedded in the door. In one or two instances the door, massive though it is, has been penetrated by the bullets, which are not all of the same bore, some being distinctly larger than others. There is evidence in support of the theory that these bullets were fired into the door by some of Cromwell's soldiers when they were engaged in their work of spoliation and desecration of Kentish churches. Teynham Church, like others in this neighbourhood, is known to have sustained considerable damage at the hands of the Roundheads. All the stained-glass windows were destroyed, this work being presumably accomplished from outside the building. The assumption is that when the church was attacked the large west door was closed against the intruders, and that the Cromwellian soldiery, in order to force an entrance, fired at the door in the manner described. The bullets are of extraordinary size, giving the appearance of having been fired from muskets of large bore, which used to be fitted with a resting-piece, and were fired from a stationary position. In addition to the bullet holes the surface of the door is charred in one or two places, giving the appearance of an ineffectual attempt to fire the door having once been made.

TESSERÆ.

Counties Palatine.

COUNTIES palatine are so called a *palatio* because the owners thereof—the Earl of Chester, the Bishop of Durham and the Duke of Lancaster—had in those counties *jura regalia* as fully as the king had in his palace *regalem potestatem in omnibus*. The peculiar jurisdiction and form of proceedings of the courts of law in the county palatine of Lancaster are the result of those privileges which were granted to its early earls and dukes to induce them to be more than ordinarily watchful against the predatory incursions from the Scotch border, and to prevent their tenants from leaving the territory defenceless and exposed to hostile aggressions, while seeking redress at the more distant tribunals of the realm. Law was to be administered by the officers and ministers of the duke, and under his seal; and anciently all offences were said to be against his peace, his sword and dignity, and not as now "against the peace of our lord the king, his crown and dignity."

The king's ordinary writs for redress of private grievances, or the punishment of offences between man and man, were not available within the county palatine, such writs then ran in the name of the duke; but in matters between the king and the subject the palatine privileges could not contravene the exercise of the sovereign power, and the prerogative writs were of force lest injuries to the state should be remediless. Since 27 Henry VIII. all writs have run in the name of the king, and are tested before the owner of the franchise. Hence it is that all ordinary writs out of the king's court at Westminster for service in this county are addressed to the chancellor of the duchy, commanding him to direct the sheriff to execute them, and that all processes to that officer out of the chancery of the county palatine are not tested before the king or his justices at Westminster, as in other counties. The franchise and revenue of the duchy being under different guiding and governance from those of the crown, all honours and immunities and all redress within this county, with very few exceptions, must be derived from the chancellor of the duchy, as the principal minister of the king, in his capacity of Duke of Lancaster. Justices of assize, of goal delivery and of the peace are, and ever since the creation of the county palatine of Lancaster have been, made and assigned by commission under the seal of the county palatine, and the sheriffs for the county of Lancaster are appointed in the same way.

Chateau-Gaillard.

The ruins of Château-Gaillard, that key of Normandy, reveal Richard I. in the character of a great captain and subtle engineer. The very situation of the place was chosen with rare skill to separate the mighty French forts of Vernon and Gisors, to command the Seine, cover Rouen, and be a strong coign of vantage over his enemy's country. Nor were the details of the plan itself less remarkable for strategic skill. Over against a bold peninsula, two sides of which were covered by the Seine, Richard erected, firstly, a strong octagonal work, with ditches, palisades and towers, upon a little island situate just at the apex, connecting both banks by a wooden bridge. This commanded the river and secured communication between the contemplated fortress on the one hand and the opposite shore on the other. He made the *tête-du-pont* on the right bank opposite the peninsula large and strong, so that it soon held a small town, styled Petit-Andely. Behind this, by retaining the waters of two streams which joined the river there, an immense moat was formed which completely isolated the bridge, *tête-du-pont* and camp from that, the enemy's, side. At the head of the lake or moat, the Grand-Andely was strongly fortified and ditched. These works still exist. Upon a promontory rising more than a hundred yards above the Seine was planted the principal fortress, advantage being taken of every projection of the rock; towards the south a very narrow tongue of land served to link this promontory to the surrounding hills. At the base of the escarpment and enfiladed by the castle a stockade, composed of three rows of piles, was placed across the Seine, which was further protected by palisaded works along the side of the right bank, also a wall descending from a tower built halfway up the hill, and a fort lower down the river, guarding its flank. The peninsula was thus secured. The single attackable point of the fortress was the tongue of land. In front of this was erected a strong and lofty tower, the parapets of which attained to the level of the topmost plateau, and commanded the summit of the hill; this was flanked by two others, connected by curtains to it, which, diverging, were united again by another curtain, forming on the whole a triangle; at the points of union were placed two more lofty towers. This work had therefore five great towers, and was nevertheless but an advanced defence for the citadel, from which it was divided by a deep ditch cut in the solid rock, and portion of an escarpment carried all round, and down to the river. On the other side of the fosse, and parallel with the base of the triangle, ran a curtain, at whose ends stood two more tall towers commanding the former; from this the curtains ran backwards to a further pair of towers, somewhat wider apart than the last; thence the walls followed the natural form of the rock and enclosed the great central donjon. From the walls of this, again, sprang the fortification of the "interior castle," sweeping in an irregular ellipse, whose long diameter was about 70 mètres (the whole castle, with the outwork, being about 180 mètres). A peculiarity in the construction of the *enceinte* of the internal castle characterises the genius of the royal engineer; it is formed of a succession of segments of a circle, the chords about 3 yards in length, connected by portions of curtain-wall not more than 1 yard long; consequently the attack of such a wall, loopholed as it was, was a serious matter indeed. The donjon within was not less admirable as proof of art. The castle was furnished with vast cellars, stables, offices, a chapel, a well and tunnels bored in the rock. In addition to the out-works first named, there were numerous towers and flank-works stepped along the cliff and down upon the river bank. Proofs of design of the highest order exist throughout. One year had sufficed for Richard to erect all these enormous works and the whole system of defences which was attached to them. Well

might he exclaim, in his heart's pride, "Is she not fair, my daughter of a year!" when he beheld them completed.

The Palace of Az-zahra.

The palace of Az-zahra is one of the familiar names of the romance of Spanish history. It is known to all the world how Abdurrahman, to gratify the capricious fancy of a beautiful and beloved mistress, expended millions and tasked the labour of thousands in erecting on the plain beyond Cordova a fairy palace and city which might bear her name and be her own. And like a fairy fabric did Az-zahra vanish, for so utterly was it destroyed during the wars and civil tumults attending the fall of the race which raised it, that at the present day not a stone can be found, not a vestige even of the foundations traced, to show where it once stood, and all that we know of this "wondrous freak of magnificence" is drawn from the glowing accounts of contemporary writers, who saw it during the brief period of its glory. It is principally from Ibn Hayyan that Al-Makkari has copied the details of this marvellous structure, with its "15,000 doors, counting each flap or fold as one," all covered either with plates of iron or sheets of polished brass, and its 4,000 columns, great and small, 140 of which were presented by the Emperor of Constantinople, and 1,013, mostly of green and rose-coloured marble, were brought from various parts of Africa. Among the principal ornaments were two fountains brought from Constantinople, "the larger of gilt bronze, beautifully carved with basso-relievo representing human figures," the smaller surrounded by twelve figures, made of red gold in the arsenal of Cordova; they were all ornamented with jewels, and the water poured out of their mouths. The famous fountain of quicksilver, which could be set in motion at pleasure, was placed in the Kasr-al-Kholaiifa, or hall of the caliphs, "the roof and walls of which were of gold, and solid but transparent blocks of marble of various colours; on each side were eight doors fixed on arches of ivory and ebony, ornamented with gold and precious stones, and resting on pillars of variegated marble and transparent crystal, and in the centre was fixed the unique pearl presented to An-nassir by the Greek emperor." The mosque and baths attached to the palace were on a corresponding scale of magnificence, and the number of inmates, male and female, is said to have been not less than 20,000. The expenses of the establishment must have consumed the revenues of a kingdom, if we are to believe the statement that 12,000 loaves of bread were daily allowed to feed the fish in the ponds. "But all this and more is recorded by orators and poets who have exhausted the mines of eloquence in the description," says Al-Makkari, who, after enlarging upon "the running streams, the luxuriant gardens, the stately buildings for the accommodation of the guards and high functionaries, the throngs of soldiers, pages, eunuchs and slaves, attired in robes of silk and brocade, moving to and fro through its broad streets, and the crowds of judges, katibs, theologians and poets, walking with becoming gravity through the spacious halls and ample courts of the palace," concludes with a burst of pious enthusiasm. "Praise be to God who allowed those contemptible creatures (mankind) to build such palaces, and to inhabit them as a recompense in this world, that the faithful might be stimulated to the path of virtue, by reflecting that the pleasures enjoyed by their owners were still very far from giving even a remote idea of those reserved for the true believers in paradise."

Palladio's Treatment of the Orders.

Palladio scarcely ever repeated himself in any of his numerous compositions; he had at his disposal all the means, all the combinations which the elementary parts of architecture could furnish, and he had the art of moulding them to his use, without ever exceeding the just medium which the art permits. His orders are elegant, and he did not scruple to vary the proportions of an order, according to the nature of the building to which it was to be applied; he generally made the heights of his columns, when used in a particular storey only, equal to the width of his principal rooms; a circumstance probably accidental, but which might have suggested itself from the rule, established by Vitruvius in the case of a circular temple, for making the heights of the column equal to the width of the cell. Palladio adapted the composite and Corinthian orders to enclose two storeys of apartments. He was extremely partial to the use of the Ionic order, yet the others, particularly the Doric, were frequently employed by him; he occasionally made use of insculcating columns, a practice not to be recommended for adoption. If the front of the house in which Palladio lived is truly of his own design, he committed a great error in giving the Tuscan base to both the Ionic and Corinthian orders employed therein. It is true it is used at the Coliseum in the Corinthian order, but in so immense an edifice a small part being irregular is, perhaps, not of so much consequence, as from the elevated and combined situation it appears no more than a speck; but where it is brought so much nearer the eye, as in a private dwelling, any irregularity must certainly be considered as a violation of the

rules of architecture. Palladio occasionally used insulated pilasters, and Inigo Jones rendered them much more familiar to us. Palladio left the columns and pilasters plain when used at the ends of porticoes, and most of the school have followed his example. He was generally particular in applying a single order to each storey it was intended to decorate, though in large buildings he had no objection to introduce at the angles a tier of mezzanine windows, occupying perhaps four storeys in height; the larger orders he retained for his entrance-halls and courts, with small pilasters behind them to carry the floor of the gallery. His favourite display of the orders seems to be the Doric and Ionic, then the Ionic, and thirdly Ionic and Corinthian. Of the first, the Chiericato Palace affords a good example; the second appears mostly in the porticoes to the country houses; the third is shown in the house at Udine. He also used the Ionic alone with good effect on a rustic basement, and in the same way the Corinthian. The upper orders are sometimes placed on pedestals and sometimes not, and the pedestals are as often found without plinths, both arrangements seeming to depend upon the position of the windows and the height of the storey. The lower columns were placed upon plinths or surbasements; the larger orders generally upon pedestals, to give additional height to them. These peculiarities of manner are only observable in the works themselves, for he has not left any directions concerning the composition or design of edifices, the only glory of the architect. Decorations, however they may affect the less educated, are least regarded by the judicious eye. In windows having columns for part of their enrichments he generally used the order ranking under that employed as principal. All these peculiarities are seen in the school, but after the time of Jones the lesser orders were not so generally adopted, but the larger were employed to decorate the whole height of the façade; while another characteristic at that period is the use of the space under the entablature of the Corinthian order, formed between the caps of the columns and the continued necking, which space was usually decorated, sometimes extravagantly so by festoons, with masks and other ornaments. Palladio's designs, which have been such happy models for architects, abound, as has been shown, with various instances of the different dispositions of the orders, but he has not always trusted to them for the effect he required; in some places he has introduced arcades, and in others, even plain walls, under his skilful direction, make an elegant appearance.

Rubens's Composition.

The composition of Rubens is indeed the most ornamental of any painter; and more than any other delights in the play of serpentine lines, rejecting as much as possible everything rigid and formal. Who would indeed wish it other than it is, excepting in character and form? and in reference to these we should certainly prefer another Moses and another Aaron in the place of those in his *Brazen Serpent*, and we should all agree that his Venus scarcely vindicates the taste of Paris. Whatever appearance of art there may be in the arrangement of Rubens's materials, it is always so much under the influence of natural principle, and there is so much of life and of energy and unity of purpose in him, that painting would have wanted a great and splendid feature had he never appeared. Indeed he reconciles us to a degree of artifice which, instead of being objectionable to him, makes his style, compared with that of others, something like the difference between verse and prose. Even the ostentation of art in Rubens sits gracefully on him. He is not to be censured for wanting simplicity of line, for his aim is to unite the utmost intricacy of beauty of which composition is capable with the greatest possible breadth—an aim in which he has entirely succeeded. Rubens is the great painter of action; in such works as *The Battle of the Amazons* and *The Fall of the Damned* there is an impetus in the struggling and falling groups which we find nowhere else, excepting in Michel Angelo's *Last Judgment*; and it was not ill said of one of his hunting-pieces, founded on Leonardo da Vinci's *Battle of the Standard*, that "it seems as if painted on horseback." But it is the besetting sin of genius so animated as that of Rubens to delight itself beyond bounds with what it can do best, and movement composition sometimes carries him into mannerism. There is in the Louvre a small and slight work of his masterly hand, the subject of which is a village festival. It contains not less than 100 figures, and of these scarcely one or two are not in motion, dancing, romping and rolling on the ground, while even of those who sit on benches or on tables not one appears to be able to sit still. It is a wonderful display of the most difficult attitudes, mastered with consummate ease, but the whole together is too far removed from the probabilities of nature; and any picture of the younger Teniers of a similar subject placed beside it would show at once how much the truth is to be preferred to such splendid falsehood. And yet Rubens could be simple, and is often and most so in his landscapes, and particularly where they are, as is frequently the case, transcripts of nature. The beautiful *Moonlight*, once in the possession of Rogers, the poet, by his hand, is a scene of

such perfect stillness that you would seem to hear a horse in the foreground cropping the grass; and there are others of his landscapes, of which the engravings by Hendrix are common, as simply natural as are many of Gainsborough's.

Children in Raphael's Pictures.

In nothing does Raphael appear to more advantage than in the introduction of children into his compositions, and he was extremely fond of introducing them whenever the subject allowed him. A fault of many painters in their representations of childhood is that they make it taking too great an interest in what can only concern more advanced periods of life. Raphael's children, unless the subject requires it should be otherwise, are, as we see them generally in nature, wholly unconcerned with the incidents that occupy the attention of their elders. Thus, the boy in the cartoon of *The Beautiful Gate* pulls the girdle of his grandfather, who is entirely absorbed in what St. Peter is saying to the cripple. The child, impatient of delay, wants the old man to move on. In *The Sacrifice at Lystra* also the two beautiful boys placed at the altar to officiate at the ceremony are too young to comprehend the meaning of what is going on about them. One is engrossed with the pipes on which he is playing, and the attention of the other is attracted by a ram brought for sacrifice. The quiet simplicity of these sweet children has an indescribably charming effect in this picture, where every other figure is under the influence of an excitement they alone do not partake in. Children in the works of inferior painters are often nothing else than little actors, but one of the very greatest distinctions of Raphael which separates him from most of his imitators is that his expressions are always genuine, never acted. This is a difference that cannot be described; it can only be felt, but it places him still higher than even his invention, his skill in composition, or his grace; though indeed of the last it is the great charm that it is never acted grace.

Teniers's Styles.

The early works of Teniers invariably partake of a brown tone of colour, and such appear to have been painted previously to his thirtieth year, about which period he gradually quitted these predominant brown tints and adopted a much more clear and what is termed silvery manner of colouring. Many of his finest works are dated 1647. In his latter time his handling became feeble and tremulous and his colouring less transparent, with a tendency to a yellow brown. The vehicle or medium used by him in painting was evidently of the same kind as that with which Rubens, Breughel, and other artists of that school worked; and, whatever this medium may have been, it is plain that it possessed two very important qualities, namely, of giving transparency to the colours, and being a convenient texture for its application; for nothing short of these, in conjunction with a perfect knowledge of the principles of the art, could have enabled him to produce such an incredible number of pictures, many of them filled with a multitude of figures displaying the most lively animation and an infinite variety of action. The pictures most esteemed by connoisseurs are those painted on a light ground, formed with a preparation of chalk or plaster of Paris, over which he scumbled his various tints of brown and pearly grays; the figures, and some of the accessories, were at the same time spiritedly sketched in with bistre, and the principal shadows thrown in; these were succeeded by the half-tones, taking always especial care to preserve delicacy and transparency. In the finishing all the higher lights, and whatever required solidity, were charged with a body of colour; a few sparkling and spirited touches, and occasional glazing tints, completed the work. Some idea may be formed of the extraordinary number of pictures produced by this expert painter by a quotation of his own words, "that it would require a gallery two leagues in length to contain all his pictures."

Ancient Paintings.

There is no doubt a certain degree of sameness in the ancient Greek and Roman paintings which have survived. The Romans only copied themselves and the Greeks, therefore they had not that range over all ages and all situations which is open to modern art. The Greeks, who only depicted themselves, and an occasional Persian or Amazon, were still more confined as to models. The shading of a modern picture is generally artificially contrived by a light let in by a small window, or even a small hole in a shutter purposely closed, and which produces an effect rarely observed in nature. The ancients, on the contrary, seem to have preferred the light of day for their works, and one curious advantage is gained by it. The pictures of the ancients produce a pleasing effect when only surrounded by a simple line of red, while the very best of modern paintings is very much indebted to the carver and gilder for its gorgeous and burnished frame, without which its beauties are so much diminished that it almost ceases to be a decoration to an apartment.

NOTES AND COMMENTS.

A COLLECTION of historical and architectural notes on Whitehall by the Rev. W. J. LOFTIE forms the latest monograph of the *Portfolio* series. The subject is interesting, and Mr. LOFTIE has often demonstrated his acquaintance with all that can be known about London. The illustrations are from rare prints. Mr. LOFTIE is occasionally severe on modern architects, and he is surprised that INIGO JONES's design for Whitehall was not realised when it became necessary to erect new Houses of Parliament. But we presume he does not expect that anything he can say will make the public undervalue architects. Mr. LOFTIE concludes that JONES when he designed his palace only "made these beautiful drawings for his own pleasure, a kind of vision which he knew could never be realised" on account of the expense. How could he tell the extent of the king's accumulations or estimate the yield from subjects' purses? The design is so well adapted to the site one cannot take it for a castle in the air.

ON Wednesday the half-yearly meeting of the Court of Governors of the University College, North Wales, was held in Bangor. It was announced by the principal, Dr. Reichel, that the council had passed a resolution asking the Court of Governors to appoint six of their number to act with a like number of the council and delegates from the Bangor City Council, to consider the question of providing additional building accommodation at the college, rendered necessary by the large increase in the number of students. The council could see their way to provide temporary increased accommodation for the next session, but owing to the large expenditure involved did not like to act in the matter of permanent accommodation without the co-operation of the court. Accordingly six of the governors were selected to consider the subject.

BUILDING in New York is not always the creating of structures that will last for ages. There is an official building department in the city, but as happens often with authority in America, it can occasionally display inactivity that in a political sense may be masterly, but not in any other. A disaster which has occurred in Orchard Street has opened men's eyes to the dangers which some builders are preparing, and there is an outcry against official and other negligence. Among other bodies the grand jury have taken the trouble to recommend a reorganisation of the Department of Buildings on the following basis:—(1) The appointment of a superintendent of buildings who shall have been for ten or more years in active practice as an architect or civil engineer, or engaged in business as a builder. (2) A deputy superintendent of buildings as above. (3) A civil engineer to be chief of the engineer's department, who shall be a graduate of a recognised scientific school or college. (4) Two assistant engineers qualified as above. (5) A clerical force necessary for the work of the office, to be composed of persons familiar with plans and building operations. (6) The district inspectors, those at present acting, to appear before a competent board and be examined as to character and fitness to discharge their duties, and such only as shall pass a satisfactory examination to be retained, present and all future vacancies in the department to be filled by graduates from the architectural or engineering departments of recognised schools or colleges. (7) The sanitary department may be left as at present constituted. (8) An advisory board constituted as follows:—Two architects, one to be appointed by the mayor and one by the local chapter of the American Institute of Architects; one civil engineer, to be appointed by the local society of civil engineers; one sanitary engineer and one mason builder, each appointed by the three members first above named; one member of the Board of Fire Underwriters, appointed by that organisation and the superintendent. Members of the advisory board to meet at least once a week, and be paid 10 dols. each for every session. The duties and powers of the board shall be to exercise a general supervision of the work of the building department, in addition to which it shall have the appointment of and shall fix

the salaries for all *employees* of the building department, except that of superintendent of buildings. A majority of the board as above constituted shall be competent to act. (9) No existing building to be torn down, demolished or removed without a permit from the Department of Buildings. We also recommend that no building be erected hereafter or changes or alterations made to an existing building without the employment of a duly licensed architect, who shall furnish the necessary plans and specifications of the same and superintend the same from first to last during its progress. No person to practise the profession of architecture, make plans and specifications for a building or superintend its erection unless duly licensed for that purpose and registered. In reorganising the department we would suggest that a separate class of inspectors be appointed for ordering and locating fire-escapes and passing on their construction, and whose duty it shall also be to examine and report all buildings regarding the posting of notices called for by law respecting the weight allowed to be carried per square foot of floor space. The great objection which will be raised against the proposal is that so little is made of political qualifications.

THE report by Captain J. H. THOMPSON, R.A., Her Majesty's Inspector of Explosives, on the circumstances attending the explosion which occurred at the dynamite factory of NOBEL'S Explosives Company at Ardeer, in Ayrshire, on January 5 of this year, makes it evident that specially adapted construction will be needed in all buildings where explosives are made or stored. It appears that on the day in question a fire broke out in a building licensed as a laboratory magazine to contain miscellaneous explosives, and while the factory fire brigade were endeavouring to extinguish it a violent explosion occurred, causing the death of two men and severe injuries to two others. Captain THOMPSON mentions three possible causes of fire in the building, namely, ignition of the roof by a spark from a chimney or locomotive, ignition of the woodwork by long-continued proximity to the steam pipes, and the spontaneous ignition of one or other of the explosives. Of these the third he holds to be far the most probable, and therefore he discusses it at some length. He points out that all nitro-compounds are more or less liable to decomposition by prolonged exposure to high temperature. This decomposition is attended with an evolution of heat, and if it takes place sufficiently rapid the heat evolved may suffice to cause ignition. Captain THOMPSON therefore thinks it probable that one of the smaller samples on the shelves first ignited and set fire to the woodwork, and that the explosion was due to a burning fragment of wood being projected on to some boxes in the middle of the building. He attaches no serious blame to any one, and notes that with a view to prevent accidents of a similar kind in the future the company propose to make several alterations in reconstructing the building.

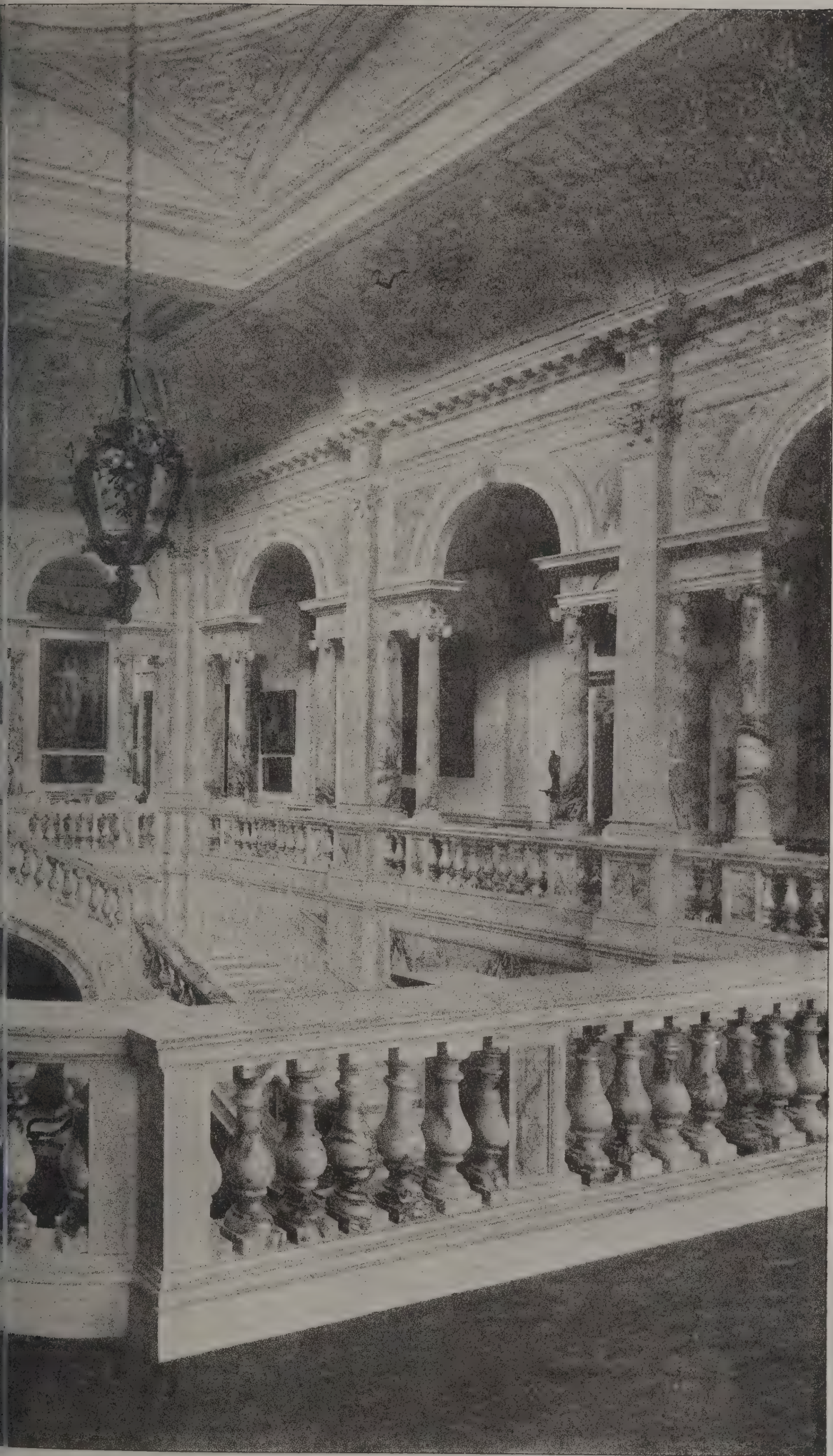
FROM the annual report it appears that the condition of the Sheffield Society of Architects is satisfactory. There is a balance in hand of 64*l.* 0*s.* 6*d.*, which exceeds the wealth at the beginning of the year by 59*l.* 12*s.* 6*d.*, and while subscriptions are owing there are no liabilities. Allusion is made in the report to the award of the School Board with respect to a school at Tinsley Park, which was so much at variance with the conditions that the competitors sent a protest to the Board, and the Council forwarded a letter of complaint, but no satisfactory reply was received. Visits to Wentworth House and Hardwicke Hall are contemplated. The following officers have been elected:—President, Mr. CHARLES HADFIELD; vice-president, Mr. R. W. FOWLER; treasurer, Mr. F. FOWLER; hon. secretary, Mr. C. J. INNOCENT; council, the above officers and Mr. T. J. FLOCKTON and Mr. E. M. GIBBS (ex-officio), and Messrs. T. WINDER, J. SMITH, W. H. LANCASHIRE, H. W. LOCKWOOD and W. C. FENTON. Messrs. F. W. CHAPMAN, C. M. HADFIELD, C. F. INNOCENT, J. B. MITCHELL-WITHERS and J. R. WIGFULL were elected a committee to manage the sketching class.



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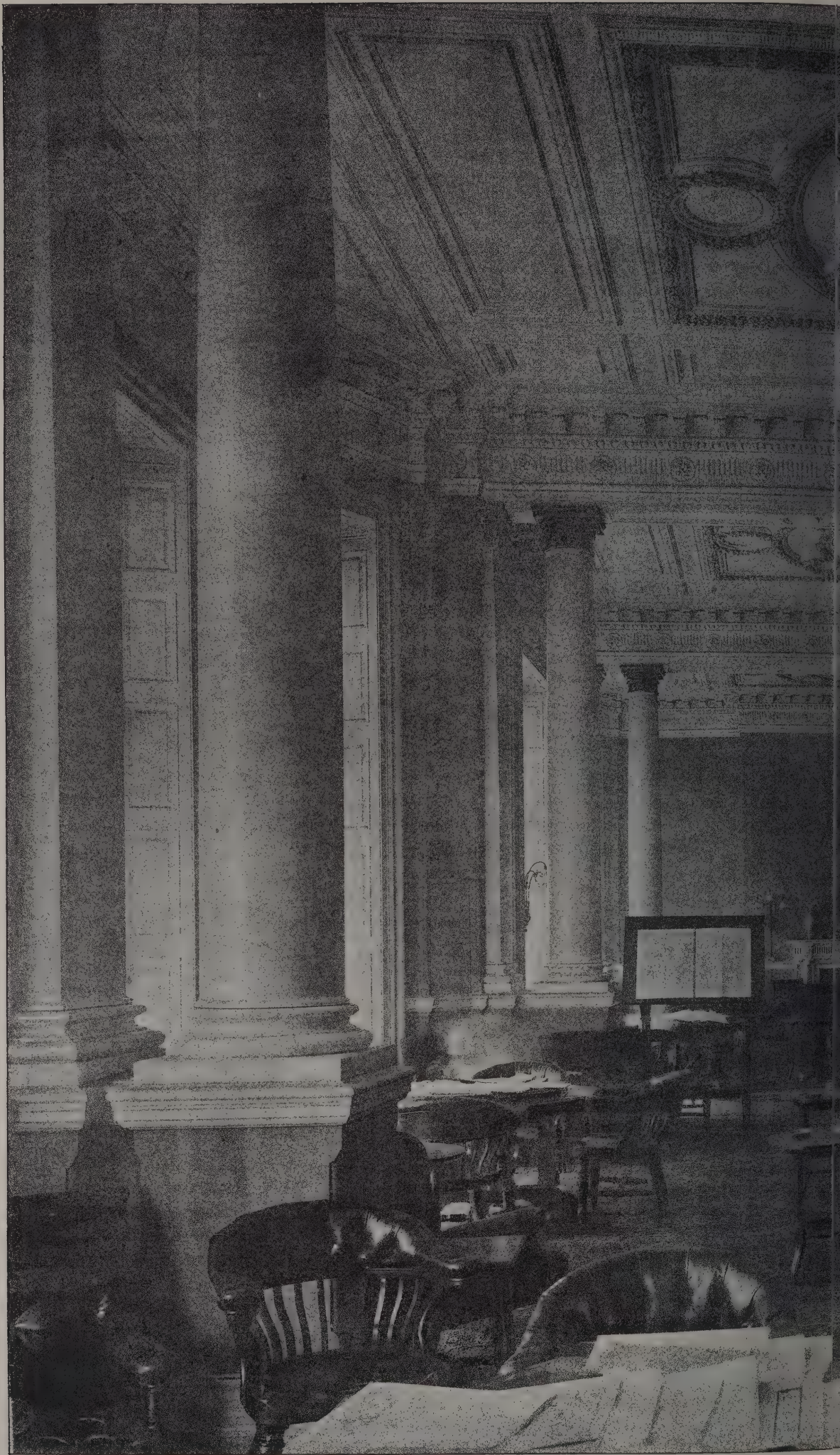
GRAND STAIRCASE: GOSFORD HOUSE
WM. YONKINS

April 19th 1895.



INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

HOUSE, LONGNIDDRY, N.B.
Architect.



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April 19th 1895.



INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

INSTITUTIONAL CLUB, PICCADILLY.
Architect.



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April 19th 1895



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BARTON HALL, CHESHIRE.

ILLUSTRATIONS.

GRAND STAIRCASE, GOSFORD HOUSE, LONGNIDDRY, N.B.

SMOKING-ROOM, JUNIOR CONSTITUTIONAL CLUB, PICCADILLY.

ENTRANCE FRONT, BRERETON HALL, CHESHIRE.

THE RUINS OF TIMGAD.

A CORRESPONDENT of the *Journal de Genève* supplied the following interesting account of a visit to the ancient city of Thamugadi:—

I have just seen a marvel, that is Timgad, a Roman city of which the ruins have an area of nearly 250 acres. Forgotten by history during many centuries, it arises slowly from the ground, thanks to the excavations there conducted for two years and a half. It is another testimony to the power of the Roman people. The ruins are situated at a distance of 24 miles from Batna in a south-easterly direction.

The road, which is in good condition, passes through Lambèse, which was formerly the principal quarters of the third legion of Augustus. The Roman camp measures 500 mètres by 420 mètres. In the enclosing wall were four gates, of which two have survived. At the intersection of the principal roads is found the prætorium, or offices of the commandant of the legion. It is quadrangular, and measures 33 mètres by 30 mètres. It is in tolerable condition. The façades are 15 mètres high to the cornice. The interior, which is open to the sky, has been converted into a museum, where we see fragments of statues, inscriptions, gravestones or votive records found at Lambèse or at Timgad. In the environs of Lambèse are two triumphal arches, one dating from the time of Commodus; the other, which is the more beautiful, from the time of Septimus Severus. There are also the ruins of two temples, one of which was dedicated to Esculapius and Hygeia jointly. The second was dedicated to Jupiter, Juno and Minerva. They are in a more ruinous state than the prætorium, and they could hardly be otherwise. The materials of the ancient Lambèse were utilised to construct the city of Batna, which dates from 1849, as well as the new Lambèse, which occupies a part of the Roman city, and also to build the great penitentiary, a large building containing 900 prisoners. From this it is evident that the Vandals have had successors.

Thamugadi, wrongly called Thamugas by some scholars (the Arabs called it Timgad), occupies a site that has an altitude of between eleven and twelve hundred mètres. About twenty years ago an Englishman, Mr. Playfair, drew the attention of his countrymen to the ruins. They remained, however, neglected until M. Ballu, the architect in chief of the historic monuments of Algiers, ordered excavations to be commenced, which have been crowned with astonishing success. The resurrection of Thamugadi must be ascribed to his influence.

The Algerian Pompeii dates from the first century of our era. It was traversed by two principal highways, of which the pavement in blue limestone from El-kantara has been found in a perfect condition at a depth of about 10 feet. The stones are of large size, sometimes measuring more than a metre and a half in length. They are deeply furrowed by the wheels. The sewers ran under the road, and could still be utilised. The *latrina publica*, which have divisions marked by dolphins carved in stone, have a monumental character that is no longer given to such places.

Numerous monuments surround the forum of the city. On the east side is a grandiose basilica measuring 38 mètres by 20 mètres, the curia and the Temple of Victory; a portico in the form of an elegant colonnade surrounded the place, with the exception of the part before the tribune, which was left open in order that the orator could be seen by the crowd. From the forum a passage led direct to the theatre. The lower ranges of seats are intact; thirteen columns out of fifteen remain, but in a truncated state. About 4,000 spectators could be accommodated in the theatre of Thamugadi. The greatest width is 63 mètres, which exceeds by 3 mètres the theatre at Philipville. At Taormina the width was about 108 mètres.

The culminating point of the city was occupied by the capitol. There was erected a temple dedicated to Jupiter, Juno and Minerva. The proportions were colossal and the style Corinthian. It was approached by thirty-eight steps; the height of the columns was 14 mètres, the diameter of the shaft at the lower part was 1.44 m. The capitals measure 1.58 in height. From the terrace of the temple the whole extent of the city was dominated. The soil is strewn with *débris*, and trunks of columns emerge here and there.

At a little distance from the capital at the road which leads to Lambèse is a majestic triumphal arch. It was constructed

by Trajan in the year 100, and has three openings. It was adorned with niches, statues and columns in the best Corinthian style; unfortunately it has suffered much from earth tremors, stones and columns are disjoined, and it has been found necessary to construct arches of masonry in the interior in order to sustain the structure.

What is more important than Trajan's Arch, or the theatre or the baths or the forum or the basilica, is the market or *macellum*. A portico with eight columns, of which the bases alone remain, led to a rectangular court, with a fountain in the middle. At the end, which was semicircular, are the remains of the shops of the merchants with stone tables. They afford an idea of one phase of Roman life. We can assist in imagination at the everyday transactions between buyers and sellers, and neither at Rome nor at Pompeii is it so easy to reconstruct an antique market as at Thamugadi.

Although the initiative of the excavations must be ascribed to M. Ballu, credit is also due to Felix Watin, architect, who was the conservator of the ruins. He has directed the operations with all the competence of an enthusiastic archæologist. He has collected in a small provisional museum, which is not yet open to the public, a great many rarities, including amphoræ, vases, utensils, fragments of fine statues, tragic masks, about 3,600 Roman coins, which will be kept in a bath of oil for four months, a Roman balance with a series of weights in polished stone, and other things.

The thickness of the soil which has covered the ruins is of an average depth of from two and a half to three mètres. The sum allowed for excavations is 40,000 francs a year. The works are suspended during the winter and are resumed in spring. The men confined in the penitentiary are employed on the works. For restorations M. Watin hires masons at Batna or at Lambèse. They are mostly Italians or masons from Ticino; the latter are the best workmen. Up to the present not one Frenchman has offered his services.

This year it is proposed to operate on the ground between the baths, the capitol and the market, and a successful result is anticipated. As showing the interest taken in the ruins, it may be added that about 600 tourists visited Thamugadi during last year.

THE VIA APPIA.

THIS road was first constructed by Appius Claudius, the censor, 310 years before the Christian era. It was, indeed, repaired by the Emperor Trajan, but about nine hundred years after its foundation the secretary of Belisarius saw it in all its pristine solidity. So durable is "the queen of roads" that between Rome and Capua may often be observed the foundations and materials of which it was built. It will be so seen near the tomb of Cæcilia Metella. The substructions in the valley of Aricia are still the wonder of posterity; it traversed the Pontine marshes by the well-known places of the Three Taverns and Appii Forum, and the first town in the Neapolitan territory is built amongst its everlasting silex stones. The description given of this road by Procopius in the sixth century of the Christian era may here be seasonably inserted:—"To traverse the Appian way," says that historian, "is a distance of five days' journey for an active traveller, and it leads from Rome to Capua. Its breadth is such that two chariots may meet upon it and pass each other without interruption, and its magnificence surpasses that of all other roads. For the construction of this great work Appius caused the materials to be fetched from a great distance, so as to have all the stones hard and of the nature of millstones, such as are not to be found in this part of the country. Having ordered this material to be smoothed and polished, the stones were cut in corresponding angles, so as to fit together in jointures without the intervention of copper or any other material to bind them, and in this manner they were so firmly united that in looking at them one would say they had not been put together by art, but had grown so upon the spot. And after the wearing of so many ages, being traversed daily by a multitude of vehicles and all sorts of cattle, they still remain unmoved; nor can the least trace of ruin or waste be observed upon these stones, neither do they appear to have lost any of their beautiful polish. And such is the Appian way." Twelve centuries since the time it was so have not entirely defaced it, and perhaps the children of ages yet to come may tread the pavement of the Via Appia. Still, no more shall the conqueror be seen moving along this road to enter the city in triumph; nor will the steps of the temple ever again be crowded to welcome the return of a Cicero from exile.

The Duke of Westminster has decided to have a light railway from Chester to Eaton Hall, on similar lines to the narrow-gauge railway laid down on the estate of Mr. A. Percival Haywood at Duffield Bank, near Derby. The cost, including equipment, is estimated at about 1,200*l.* per mile.

EXCAVATIONS AT ST. ANDREWS.

A CORRESPONDENT of the *Times* gives an account of the excavations at St. Andrews undertaken by the Marquis of Bute. In the course of it he writes:—

Nothing seems to have been done in the way of excavating at St. Andrews till 1879, when Providence showed the way dramatically enough. Some stonemasons were at work on the foundations of a new house just outside David Beaton's Castle. One man wheeling his barrow over a heap of rubbish felt the earth give way beneath him, and incontinently disappeared, barrow and all; he had fallen into what is now known locally as the Castle Passage. The place was duly examined and proved to be an undeniable subterranean alley, vaulted and floored by human hands, and running in a straight line from the castle towards the cathedral for a distance of 90 feet; there it was blocked by the wall of a house. It is provoking to think that in 1879 the house in question had only begun to be built, and that nothing but the anxiety of the builder prevented the passage from being pursued to its natural end. That, no doubt, is in the cathedral, where some people believe there is a crypt, and in the crypt the treasure of all the Fifeshire monasteries, which, tradition avers, used to be kept at St. Andrews as in a money-box in troublous times. But the melancholy fact is that Mr. Hay Fleming, the well-known Scotch archaeologist, and the only authority on the matter, thinks there is no crypt, and scouts the idea of hidden treasure. Fancy loves to think that Mr. Fleming is wrong, and at least in 1879 the truth might have been known. But between the virtuous indignation of an architect and builder and the curiosity of mere amateurs it is an unequal battle. No antiquary took the matter up; Mr. Linskill, a name well familiar to golfers and the chief leader in later excavations, was not then in St. Andrews, and the chance was lost. Let us be thankful that the passage was not closed up altogether, as was actually proposed at the time. As it is, its 90 feet may be explored by any one who does not fear a dusty jacket. Entering by a wicket of red brick which has been put up under the ivied wall of the castle, such an adventurer finds the way descend abruptly at a height of 14 feet and a breadth of 5 feet, with a groove cut in the rocky floor, until it widens suddenly and falls upon a lower storey. This is reached not without difficulty and a ladder, when the explorer finds himself in a room about 14 feet broad and 10 feet high. Passing through this he will come to the foot of a wide staircase cut in the living rock. There are 34 steps, and then comes the obstructing wall. In this room there are stone tables, shelves and chairs; and worth noticing also are the *culs-de-sac* which diverge from the main passage close to the entrance, one of them going to the length of 21 feet westwards, the other turning eastward for only 5½ feet. They are usually explained by the theory that the builders were trying for the nearest way to the cathedral.

The Castle Passage, so fortuitously discovered, remains the only authentic trophy of its kind. Its discovery, of course, set people trying for other subterranean alleys, and in those days Mr. Linskill's informal society was formed for their pursuit. But the records of the Society are rather plucky than exultant reading. Several bits of passages have been found or have seemed to be found; they have invariably blocked at crucial points. Of these the Pends Passage was the most notable. It was discovered in 1884, when a plumber—his profession alone ought to have discredited him—declared that he had come upon something similar to the Castle Passage fourteen years before when he was laying the gas-pipes of what was then the College Hall. The excavators pierced a road running south of the priory at the point indicated by the plumber, and in two days' hard work disclosed a most promising and satisfactory passage. They explored it for about 70 feet from the entrance, but encountered then the wall of the priory and a vandal—in its proprietor of that day—who sternly forbade them to go further. So the Pends Passage was filled up and remains a pleasant reminiscence, for the hard labour it cost—given by more than one working man gratis—and for the interest which Bishop Wordsworth took in it. Its mystery, however, is dissipated, for Lord Bute's digging within the priory has proved it to be little better than a drain. The conclusion of the whole matter seems to amount to a strong probability that there are many other passages if they could but be come at. What chance discovered once in the instance of the castle chance will probably discover again, and, considering its history, St. Andrews may well be honey-combed with such hidden exits and entrances. Perhaps the most interesting word on the subject was that of an old stonemason who was near his end when the Castle Passage was discovered. He recalled the year '30 and the tardy removal by Government of the rubbish which had been allowed to accumulate at the ruined cathedral. One day a mass of stones, great and little, was pushed aside, and, lo! the first steps of a winding staircase lay open to the air. The foreman ordered it to be covered over, and accordingly it was covered over, but

his comment was startling. "Oh," said he, "it'll just be one of they staircases that go down to the sea." He was used, this foreman of the year '30, to such disclosures.

The priory was built about the beginning of the present century, and, if vengeance waits below upon Philistines, the first proprietor's case is pitiable. It was not enough to build—hideously—on the site of the Hospitium Vetus; he must erect a hothouse against the south wall of the cathedral, which bounded his garden, and, walling up the arches which led up to the cloister, train apple-trees thereon. Mercifully Lord Bute bought the priory in 1893, and henceforward there is an end of vandalism there. The monastic buildings were these:—There was the prior's house, or Hospitium Vetus aforesaid, which was founded about 1140 by Bishop Robert and by King David, that "Sair sanct for the Crown;" this was repaired by Bishop Lamberton. Then there were the cloisters, of which Bishop Arnold laid the foundation-stone in 760; the refectory, built by Prior John White before 1258; the great hall, or Magna Camera, in the east of the monastery, which Prior John de Haddington built about 1300; the Seintie House, known also as the sub-prior's house; and a chamber adjoining the cloister was erected by Prior John de Forfar and used by Prior William de London (in 1385). Among those who did most to improve and ornament the monastery was Prior James Holdamstone; among other pious acts he constructed what was called a "handsome palace" in the court of the Prior's Hospitium. Knox's famous sermon on Christ purifying the Temple, preached in the parish church on June 11, 12, 13, 14, 1559, made an end at once of the monastery and of the cathedral, and George Stewart was the last prior. After the Reformation the ground fell into the hands of the Duke of Lennox, who sold it to King Charles I., who in turn gave it to the Episcopalian See. The last of the buildings to go was the Seintie House, which was inhabited as late as 1805. In the Seintie House was held an eponymous market, one of the greatest of Mediæval fairs, and attended by merchants from all parts of Europe; the monks presided over this so long as there were monks at all, and after the Reformation the provost (*Anglice* mayor) got leave from Government to hold the fair in the familiar place.

Lord Bute began to excavate in October 1893 without, so far as one can gather, any fixed design. He dug first about the site of the sub-prior's house, now used as the coal-cellars of the priory, to the extent of 80 feet, but found nothing of any interest. Next he turned to the site of the refectory, a few steps south of the priory, having the cloisters on the north. The refectory, according to Martine, the murdered Archbishop Sharp's secretary, was 108 feet long. Here the crypt was laid open with several of its pillars standing upright. Pursuing something like the famous method of Zadig, Lord Bute has filled in the missing pillars and stones, these and all new buildings being erected in red stone brought for the purpose from Dumfries. Thus the grey stone of Mediæval builders and the red stone of those of to-day stand side by side, part of the same whole; and as the old masons' marks are plainly visible on their material, so their descendants have affixed theirs also, to each man's stone his own mark. At one end of the refectory the remains of a short flight of steps are visible; no doubt it led from the refectory to an antechamber. In the crypt there are also the remains of a roundel. What was its use? Lord Bute and his architect believe that it may have been a winding staircase, and point to a similar construction in Durham Cathedral. On the other hand, Mr. Logan, the tenant of the priory, suggests that the roundel may have been built to support an oriel window where the reader would stand during refecton. Mr. Logan adds that the roundel at Durham is not properly analogous; that the steps there begin at its lowest point, while there is no trace of a staircase at the foot of the roundel in the priory. But, of course, these matters are purely conjectural; there is not enough old stone left to determine the point. From the crypt of the refectory the way leads next to another chamber. This, too, is vaulted, a cloistered pillar standing in the centre, and a big fireplace stands in one corner. Probably this was the calefactory, where the monks repaired for warmth as they might nowadays for tobacco. There are marks on the walls where the monks have tried their knives, and have even drawn roughly, as in one case the arms of Prior Hepburn, with a pastoral staff and two leopards pulling at a rose. All this seems to imply that the room was a lounge. Martine, whom we have quoted above, speaks of "a faire, square roome," which they used for their copes and albs. Beyond the calefactory were offices connected with the prior's house, and here four pillars were found still standing in position. And next to the offices this rather dreary catalogue is enlightened by a point of comparatively living interest. Martine says that the entrance to the prior's house was by "a faire gateway," and here, as in Pompeii, the marks of carriage wheels are distinctly traced on the stone. The elation over this discovery was a trifle damped when it appeared that the entrance was not part of the original design of the monastic buildings. But only for the moment; the priors, it was remembered, only used a carriage in later times,

and a few paces south a narrower gateway was found, which the priors must have used originally and discarded in their carriage days for the wider way. South of this another vaulted room with the groining still in position was encountered, and further south the once mysterious Pends Passage, which, as has been said, Lord Bute believes to have been a drain. Some stone-heads were found in it at a depth of 10 feet, the effigies of saints from the cathedral thrown in at the hour of Knox's triumph. One of these is a head of Christ, the traditional *Ecce Homo*; another seems to be an effigy of St. Andrew, with traces of crimson on the garment, and of gold and pink tinting in the features; the third has the visage of Malcolm the Maiden. Only St. Andrew has escaped mutilation, he remains of a severe and Darwinian aspect. These relics, with a pipe of seventeenth-century make, are now in the priory.

Towards the St. Regulus's Tower stand, still above ground, the ruins of the prior's house. The doorway is of the architecture of the fifteenth century, and there are two separate vaultings not communicating. Probably the second was the stable; it stands opposite, as Mr. Logan points out, to the "faire gateway" mentioned above. A stone was found in the crypt of the prior's house with this mutilated inscription:—

Lux urbis Pars Magna
fui sivilibus hic
posuit Ra-
1582.

Outside the house were found some tiles of gun-barrel make, wound round a central core. Turning finally towards the south wall of the cathedral, you come on the remains of the ambulatory cloister and of the monks' dormitory, which extended from the end of the south transept westward. Here the interest is rather historical than antiquarian, for the sake of Prior Robert of Montrose assassinated by a lay brother in 1393. The assassin Plater lay in waiting at a turn of the winding staircase and stabbed the prior as he was going to bed. Two days later Plater was led out and preached at by Bishop Traill; he was then condemned to perpetual imprisonment. His death was a miracle of priestly tact. The ecclesiastical authorities had no power of life and death, and to get a man executed they must have handed him over to civil authorities, which naturally they were loth to do. "So partaking scantily of the bread of bitterness and the water of affliction he (Plater) was soon dead and was buried in a dungeon." In fact, he was merely starved to death.

And thus one may leave Lord Bute amid his excavations. He is only at a beginning of his labours; he will go far before he concludes them. We hope that he will carry his operations into the cathedral. Mr. Linskill at one time got leave to dig within its wall at certain points, and Lord Bute has a knowledge of archaeology denied to its earlier excavators. Only let him not think of building where he digs. To rebuild the old cloisters in the priory beside the south wall of the cathedral would be a lamentable waste of work for a ridiculous result. Conceive a new cloister raised against the wall of King Robert the Bruce! With this reservation Lord Bute deserves every one's good wishes and every one's confidence.

BRAMANTE AND ST. PETER'S.

THE little town of Urbino, which in the year 1883 celebrated the four hundredth anniversary of the birth of the great painter, Raphael Sanzio, has lately, writes Mr. R. M. Mereu, in the *American Architect*, celebrated the five hundred and fiftieth anniversary of the birth of the greatest architect of the Italian Renaissance period who, in 1514, died at the age of seventy years. The name of this grand artist is attached to that of the greatest of the Catholic monuments, the incomparable church of St. Peter, of which he was one of the chief architects. The anniversary was also commemorated by an address at the Technical Institute at Pesaro delivered by Professor Benedetto Passeri, a man learned in the history of art. At the back of the peristyle of the Institute there was unveiled, in the presence of the political and administrative dignitaries and of delegates from abroad, a bust of the celebrated architect, upon which was the inscription—

TO DONATO BRAMANTE,
PRINCE OF MODERN ARCHITECTS,
THE TECHNICAL INSTITUTE OF PESARO
PROUD TO BEAR HIS NAME.
MDCCCXCIV.

The occasion was as brilliant as possible and in all respects worthy of the man it was designed to honour. Bramante was assuredly one of the artists whose works most powerfully contributed to raise the reputation of the century to which he belonged. Chance willed it that he should also be the uncle of Raphael, so that the glory of the greatest of Italian painters and that of the grandest architect are involved one in the other and belong to one and the same family.

Bramante belonged to a poor family, but had at an early hour manifested a strong leaning toward drawing, though at first he seemed rather to incline toward painting, and his father who needed to utilise the budding talent put him to study in the studio of a painter of Urbino, Carnevale, under whose direction he executed several works of very secondary worth. He went to Milan, where he studied closely the celebrated Gothic cathedral, of which the imposing style charmed him and caused to spring up in his breast the inclination toward architecture. Shortly afterwards he arrived at Rome. He still lived by his brush, and he is credited with painting over the Porta Santa of St. John Lateran the escutcheon of Pope Alexander VI. But his penchant for architecture had already become firmly rooted and he devoted the greater part of his time to analysing and measuring all the remains of antiquity remaining in Rome and its environs. Next he spent some time in the south of Italy in studying Greek and Roman remains there. Returning to Rome, he gave open evidence of his intention of devoting himself to architecture, and the first one to encourage him to follow the new career was the Cardinal of Naples, who commissioned him to construct in travertine the cloister of the convent of St. Maria della Pace. Then little by little he was helped by the same patron to secure the construction of several monumental fountains, the Palazzo St. Giorgio, the church of St. Lorenzo in Damaso and other churches. He prepared the design for the palace of Cardinal Adriano da Corneto, at Borgo Nuovo, and he conceived and carried out the enlargement of the chapel of St. Maria del Popolo. But his reputation reached its apogee in 1503, when he entered the service of Pope Julius II., lately elected, whose first commission was the creation of the Belvedere, which Bramante carried out by using two orders, Doric and Ionic. He also did a great deal of work in rearranging the interior of the Vatican Palace, especially the great galleries wherein were placed, later, the most valuable specimens of Grecian sculpture.

Bramante was inventive and impetuous; he worked with feverish and indefatigable ardour, and if events had favoured him he would in a few years have made the right bank of the Tiber a truly monumental city. Unfortunately money was sometimes lacking in spite of the munificence of the popes, and he was forced to curb the ardour which consumed him.

Amongst his chief works we must not forget to include the sanctuary of St. Maria di Loreto, which was finished later by Sansovino, nor the graceful little house in the Trastevere, which belonged to his nephew, Raphael. Yet his chief claim to fame rests on the part he took in the construction of the basilica of St. Peter, a participation which has given rise to many controversies as to whether the part he played was useful or disadvantageous to the beauty of the edifice. Bramante has been accused of too warmly seconding, through personal interest, the intention of the Pope, who wished to tear down the basilica and build a new church. He prepared an infinite number of designs, each more bizarre than the last, but which all bore trace of the fertility of the imagination whence they proceeded. The fact is that a good half of the ancient structure was torn down, and that Bramante set about rebuilding with all the impatient zeal which characterised him. At the death of the Pope the building had already risen to the height of the cornice. He was the first to use vaults with wooden projecting caissons, with the stucco ornaments that encase them, which catch the eye. To him also was due the invention of the method, subsequently used by Antonio San Gallo, of building the vaults on hanging bridges.

Bramante's design was grandiose indeed and colossal, but in addition to the fact that the money at command was not enough to provide for his vast conception, death overtook him too soon and prevented his carrying to completion his gigantic undertaking. We cannot even form an opinion of the value of his plan, because it was altered by the architects who succeeded him, each of whom, for personal reason or because they felt the need of flattering the several pontiffs who ascended the throne, one after the other found it desirable to introduce changes so as finally to totally change its spirit. In the first place there followed Raphael and Giulio da San Gallo, who, after the death of Julius II., changed the design and even altered parts already newly erected. Then came Balthazar Peruzzi, who would have liked to pull down the entire building and make a fresh start, and then in the last place came Michelangelo Buonarroti, who knew how to make all details give way before his iron will, and conform themselves to his taste and manner of conceiving and understanding things. But all contemporary writers are agreed that none of these had succeeded in imagining anything as sumptuous and magnificent as that which Bramante had conceived, and that St. Peter's would have been a monument much more worthy of admiration if Bramante's ideas had been respected. Even Vasari dares to express this belief, in spite of his love for and partiality toward Michelangelo, which so often made him unjust towards others.

He died, as we have said, in 1514, at the age of seventy. He lived ostentatiously, spending with liberal hand the money that he earned. He was very fond of music, and often improvised on the lyre; nor did he scorn to practise the poet's

art, and his biographers declare that some of his sonnets were far from bad. He was a typical artist of the Renaissance, well read and well informed and epicurean, like the popes of that marvellous epoch.

This basilica of St. Peter, of which Bramante was one of the most active architects, is a monument which has passed through the strangest vicissitudes, some of which have modified and transformed its physiognomy. It occupies the site where was in ancient times the Circus of Nero, where all the martyrs were done to death. The remains of these ancient Christians have been placed in a catacomb, of which the entrance is at the foot of Monte Vaticano, and according to a tradition, which is questioned by Protestants, the remains of St. Peter himself were transported thither by St. Marcel. However this may be, about a hundred years after the death of Jesus Christ, the fourth pope after St. Peter, St. Anacleto by name, caused to be erected here a sanctuary. The foundations of the great basilica were laid as follows:—About two centuries later the Emperor Constantine, converted to Catholicism, to show himself worthy of the baptism he had just received, undertook to construct on the ruins of this sanctuary a sumptuous basilica which should be rectangular in form and divided into five naves by four rows of columns, each nave being reached through a separate door in the façade, in this particular greatly resembling the church of St. Paul extra Muros as we see it to-day. After the manner of the time, the structure was preceded by an open square court surrounded with porticoes, of which no trace remains.

In 1440 the basilica of Constantine threatened to fall in ruins and Nicholas V., about the middle of the fifteenth century, conceived the idea of building a new metropolitan church. Nicholas was that pope of enterprise and genius who first practically opened the era of the Renaissance. He loved art for itself, not for the sake of mere show and fashion like some of his predecessors.

The architects of this new structure were Rossellini and Leon Battista Alberti; but it had been raised only a few metres above the ground when Nicholas died and the work was instantly abandoned. Paul V., a man of Venetian birth, undertook a veritable crusade to raise the necessary funds, himself giving five thousand crowns, and on his appeal the faithful sent contributions to Rome for the purpose of continuing work on a structure which shortly after was to become the most noted in the Christian world. But the merit of having given decisive impulse to this grand undertaking was reserved for Julius II., a Ligurian by birth, who, by the boldness of his conceptions and the firmness with which he prosecuted them, may be properly held one of those men of true genius of whom humanity can boast. He desired above all things that St. Peter's should be finished during his reign, and he gave the preference to the design of Lazzari Bramante, who, by the breadth of his views and the ostentatious character of his project, could not fail to seduce the imagination of such a pope. Julius II. urged him to do something which should surpass in size and majesty every fine piece of work that the world contained, and Bramante did not need to be told this twice.

The most characteristic feature in Bramante's design is that the basilica was to have the form of a Greek cross with arms of equal length. He had been much impressed at Florence by Brunelleschi's dome, which is still a masterpiece of elegance and audacity, and he dreamed of repeating it at Rome on a greater scale, to be in keeping with the programme the pope had prepared for him. To this end he had built at the four corners of the transept four enormous piers to serve as supports for the dome. Unfortunately, death surprised him while in the full current of feverish execution, and Julius II. survived him only one year.

His successor, Leo X., entrusted the work to the young Raphael and Giuliano da San Gallo. Their first care was to consolidate the substructures of the four great piers, which did not seem to them to be strong enough to bear the enormous dome which Bramante intended to place on them. It was Raphael who, setting his love for an artistic ideal above the veneration he had for his uncle, changed the general plan of the building, giving it the form of a Latin cross such as it has to-day. Unfortunately, death overtook this incomparable artist, too, in his full bloom, and from 1520 to 1546 the work had to be entrusted to divers architects, who, as much through vanity as through ignorance, often made changes in the design of the monument, which thus grew without the spirit of natural development and underwent alterations the unfortunate effects of which its general style felt. At length, in 1546, the pontiff Paul III. broke through the intrigues which up to that time had kept Michel Angelo at arm's length, and placed the work in his hands. He made the design for the dome, but before it could be built he also died. It was not finished until 1573 by Jacopo della Porta, who entirely respected Michel Angelo's design. This was not the case, however, with the façade, which according to Michel Angelo's design was not so commonplace as the one we now see, with its enormous columns planted against the wall. He intended to have the columns

stand free, forming a portico like that of the Pantheon and those of the great monuments of antiquity, which are not heavy, in spite of their often enormous proportions, simply because light and air have free play over their exterior con-texture.

During the pontificate of Paul V., Maderno finished this monumental structure by completing the façade upon which, in 1612, the name of the munificent pontiff was engraved in huge letters.

Fontana published a monograph of this building, from which it appears that up to 1694 the total sum expended upon the building had been 47,000,000 Roman crowns, which represents in our money the sum of about 45,000,000 dols. There must be few buildings in the world that have cost so much, but it is fair to say that St. Peter's, by its vast size and the richness of its details, accounts for the enormous size of the pecuniary sacrifices that its construction demanded.

The aspect of the building gives no clue to its tremendous size, for every part is so well proportioned that what elsewhere would seem gigantic here appears to be merely of normal size. The circular colonnade which surrounds the piazza serves to reduce to reasonable proportions the enormous mass of the basilica framed between the two semicircular colonnades. This is the reason why, when one undertakes to measure any portions of the building, the resulting figures are far greater than was expected. For instance, the façade has a total height of 167 feet, the columns engaged in the wall are 8·5 feet in diameter and 91·6 feet high, the cornice is 8·5 feet high, the attic 33 feet, the balustrade 5·8 feet, while the statues on the balustrade measure 17 feet. The cross which crowns the structure is 460 feet above the level of the ground. The length of the building is 613 feet and its breadth at the crossing is 124·7 feet. To get an idea of the immense size of the nave it is enough to measure the baldachino which encloses the high altar at the middle of the transept. At first sight it appears to be only of common size, and yet it is really more lofty than the Farnese Palace, the summit rising 91·6 feet above the level of the floor, that is to say 22 feet higher than the pediment of the colonnade of the Louvre at Paris.

The diameter of Michel Angelo's dome is only 3·2 feet less than that of the Pantheon, which measures 141·7 feet. The wall which supports the dome is not less than 25 feet thick and the distance from the floor to the vault of the lantern is 393 feet.

The axis of the building runs almost exactly east and west. The length from the door to the tribune is 597 feet and the width at the high altar the same. Finally, the total height from the level of the piazza to the top of the cross surmounting the lantern is 452 feet.

Michel Angelo passes for the chief architect of St. Peter's, because it was he who had the luck to give the building its definitive character. Maderno injured it by adding a façade which maims the design, and conceals from the spectator in front the view of the magnificent dome as Michel Angelo intended it should be seen. San Gallo and Raphael worked up the details and carried out some of the secondary ideas contained in Bramante's plan. Balthazar Peruzzi fortunately could not carry out his own ideas, which would have turned the temple into a ridiculous monstrosity. The real architect of this cathedral was Bramante, whose anniversary was celebrated last year, and it is proper to do the justice to his memory that is its due. Even the dome which bears the name of Buonarrotti was conceived by Bramante, and the merit is really his. The fame of Michel Angelo is sufficiently great without seeking to make it greater at the expense of others.

LANDSCAPE GARDENING.*

THE soul of the landscape gardener met many a congenial one in Babylon of old, and if he was of a social nature, his genius was enlivened while wine gave rise to many toasts in the banquetting halls upon the Hanging Gardens there. In that early time (genius and prophecy being the same as now) he must have looked upon the future world as an enviable place for his calling, seeing, as he must have seen, his art become not only perfect, but world-wide in its scope. If it has yet come to perfection is perhaps a question, but its world-wide application is as far off, maybe, as it was some thousands of years ago. Between now and that Assyrian time, however, when Cyrus and other sovereigns of the Orient ordered that their palaces and residences be set amid gardens, the years have not been passing over barrenness alone, for beautiful and many have been the spots at which they might have lingered upon the lap of Flora. Palaces in Greece and Italy gave to their occupants vistas of the sea and horizon across landscapes adorned with trees and shrubbery, decked with flowers and

* A paper by Thomas Hawkes, read at a meeting of the Illinois Chapter of the American Institute of Architects at Chicago, April 16, 1894.

plants, and arranged with that artistic skill which knew so well where and how to place appropriately belvideres and statuary. Within how many gardens did Ulysses in his wanderings set his foot? And perhaps the charms of Calypso's isle detained him there as much as the charms of herself. Was not that a garden in which his men wished so much to linger, that Lotus Land where it seemed to be always afternoon? The many references of ancient writers to gardens and landscapes actually existing show that the art was long ago well understood, and as if to show their admiration for the beauties of nature in an artistic setting, their legends refer to mythical places, as the Gardens of the Hesperides and the like.

But we must not linger too long upon these bygone ages, but take a step to more modern times and see in that rough age of Charlemagne that the emperor commanded and showed how gardens were to be laid out and planted. His people, who were warrior bred, confessed by their obeying him that the soul of man loves the beautiful, from which we may premise that were it not that landscape gardening is so little understood, and hence so little brought to mind, it would be an inseparable part of architecture; and why should not this strain of reasoning induce the thought and urge the conviction that the landscape gardener should be an architect?—that as architecture is properly distinguished from mere building by the presence of the decorative or artistic element, so landscape gardening, being similarly distinguished from mere gardening, shows the ambidextrous skill of him who, while with one hand he erects an edifice, with the other he brings the surroundings into harmony with it. Truly the day-dreamer, that person who has only ideas without the means to execute them, has generally better taste than many of those whose means are ample, for it is to be supposed that no castle in Spain was ever airily built without the surrounding landscape being made a garden of.

The arch enemy of landscape gardening is utility, that utility which signifies greed or a pecuniary profit; but those even who are swayed by it lose not the love of nature or the beautiful, even as they grow older and become more and more immersed in business, for these same persons decorate their houses to the extent of their means, take pleasure looking at the landscapes of their pictures, enjoy the scenic descriptions of the writer, and seek in summer in the country the most beautiful natural scenery that is accessible. The question, gentlemen, to you is not so much to show how landscape gardening should be done as to show how a desire may be awakened to bring it to our doors; to show how this utility may be done away with, this Gorgon that in cities turns the innate desire for natural beauty into stone, and which extends its petrifying influence into country homes. But how is to be shown the way by which this utilitarian enemy of the beautiful in nature may be led off? I know of no better method for a beginning than that of making of all architects landscape gardeners. If they were such, the future manner of building would be properly changed in respect to position and exterior form, and some of the roses, flowers and vines upon the decoration of the interior would find a place upon the lawns. The architect of this double skill, for his very love of nature and consequent artistic feeling, would prevail upon the intending builder to so plan that the grounds would receive as much attention as the house. That this would result we may fairly infer if, allowing the imagination a little play, and deeming that architecture and landscape gardening were allied, or were in unison, we consider the magnificence of the gardens of Lucullus as a result, and a very probable one, of the prevalence of the art of landscape gardening in the architectural profession of those days. And this, I think, is more than a supposition, because there were many more gardens than those of Lucullus, and many besides him indulged themselves in an art whose earliest practice was with the Persians, who, according to Sir John Malcolm, had gardens at the time of Mahabad, their first king. That the Romans, contributing to or learning from Lucullus, Adrian and others, surrounded themselves with the charming beauties of vegetation, even if the variety of flowers and plants was limited, according to Pliny, to 1,000, is proven by the country seat of the elder Scipio at Laternum, the crowding of the shores of the bay of Naples with villas, and the applauding by Sylla of the masterly skill of his rival Marius, who had placed his villa on the promontory of Misenum, which on every side commanded sea and land. Passing from that time, the art of landscape gardening seems to have been nearly lost with the fall of the Roman empire, but the splendour of imperial and private gardens, though dimmed, and maybe not so fragrant, was preserved by those monks who so well, too, preserved from oblivion the writings of Greece and Rome. Believing that a thing of beauty is a joy for ever, in more than an ideal sense, these monks perpetuated the art of landscape gardening in the careful selection of sites for monasteries and abbeys. All Italy then wooed with fragrance and beauty, revived an art the effect of which has been felt ever since, and which is strongly shown in the French style, a modification merely of the Italian, and later on the Dutch, although fantastic in many essentials, with

their level grounds, their formal terraces, their canals and straight tree planting, helped to form the natural style of the present day. But let us show now how far has been the realisation of our Babylonian brother's prophecy.

In Europe there is evidence everywhere of an inclination to the art, and in many places the evidence of masterly skill is pronounced, but principally in England has the practice of landscape gardening received the greatest attention. Wealth there, by reason of its concentration to a few, has been expended in vast sums on such work, which, embodying the merits of previous successive changes, and eliminating false styles, has through the efforts of various professors made landscape gardening to be more understandingly practised than at any time in the past.

This art of landscape gardening, which should be encouraged by the wealthy and studied and practised by the architectural profession, is of the utmost aid in obtaining noble architectural effects, and is, whether ranked so or not, above all the arts for its capacity in being able in proper harmony and design to enhance to the eye the appearance and value of a building. It is greatly educational, and consequently more beneficial than the results of the skill and genius of the artist, because, while they are appreciated only by the profession, the work of the landscape gardener is a living picture made of nature's own materials, adorned with its ever-varying beauties of hues and tints as unlimited as the variety and diversity of tree forms, shrubs, ferns and grasses, and it is susceptible to the comprehension of all and so is an art pre-eminently that refines the mind and gratifies that innate longing which most of us have for the beautiful.

"When ages do grow to civility and elegance," wrote Francis Bacon, "men come to build stately sooner than to garden finely, as if gardening were the greater perfection." How noticeable this is when, considering how the art of building has advanced, and particularly so of late in this country, we observe, and to me how lamentably, the landscape gardener's art has failed to keep pace with it. Not to be didactic, which I should consider an impertinence to my audience, who certainly must admire and more or less understand the art so dear to me, I must refer again to its relation to architecture. To understand that relation much thought is required and much experience, and as much taste to its proper achievement as either thought or experience. But some will say to this that everyone is not gifted with taste and will ask if that taste can be acquired. Although it may be taken for granted that one without taste should not be an architect, I think that taste will come with practice, for taste, if to some it be natural, is but another name for skill and can in consequence be gained with labour. As I have before expressed that the landscape gardener should be an architect, I must assert now that no landscape can be properly taken advantage of or modified, that no landscape gardening can be rightly done without a knowledge of architecture, for how can one make a landscape harmonise with the buildings and *vice versa* if he lack the knowledge of architecture? Landscape gardening also requires no slight acquaintance with engineering, because a practical knowledge of the use of materials will be required, as also that of levelling, depressing or raising the grounds; but an engineer alone or an architect who is only such will treat landscape gardening from no other view than that of the profession, and one who is a gardener merely, no matter how skilful he may be in the cultivation of plants and flowers, will have the aim only to display them, and it will follow that congruity and simplicity in all these cases will give way to novelty and picturesque effects, which are two qualities only of landscape gardening.

Intricacy is to be studied in the laying-out of the grounds, and it must have the quality of variety. Simplicity must contrast with grandeur, novelty must give it animation, association must endear it, and all must be bound in continuity. These effects can be best achieved if the landscape requirements be studied before the planning of the building is definitely made, but they can very seldom be attained, and if so in a modified form only, if the structure is erected and the grounds considered afterward. But here I must acknowledge the too apparent truth that architects are not generally landscape gardeners, but this fact should not prevent those who can often mould their clients to their will from pointing out to them the advantages to be gained by employing a competent landscape-gardener to select the site of their building when this is possible. How infinitely superior the results would be, and to how much better advantage would the buildings show, and how much would be gained in the comfort and convenience of the owner? There would be no poor perspective from the approach, where first impressions are gained, to give an unfavourable impression of the edifice that by itself might be perfect, while a proper consideration of the perspective will often make appear nearly correct a building that is the reverse. Of course in all this there is more to be studied than the immediately contiguous scenery: the characteristics of the ground and the neighbouring scenery must be taken into

consideration; the character of the soil, and, too, to arrange the relative positions of the different buildings. Drainage, also, must be taken into account. Collaterally to landscape gardening the finest views for the different rooms are to be studied, and by so doing avoid the frequent case of presenting the worst views from the best rooms of the house, and *vice versa*. A little thought in this matter will so arrange that natural or artificial beauties shall be seen from other rooms than those which are reserved for very indifferent purposes. Shelter from the wind is also an important matter and should be carefully taken into account, for, why, except to obtain a conspicuous position, should a house be built upon a treeless hill unsheltered from the wind and sun? When this is done everything is sacrificed to conspicuousness, and upon closer views the structure presents as forlorn an appearance as the eminence does a barren one. In these instances there are generally utilitarian attempts resulting in unnatural treatment of the grounds, and presenting a picture of hideousness that no after-architectural efforts can efface; but allowing that these conditions can be ameliorated, no laboured art, no amount of skill can compensate for lack of judgment or good sense in the original planning.

It may be asked with the multiplicity of architects, and with the number of them who have an abundance of time on their hands, how these conditions come about. Curious as it may appear, people who would not think of erecting a building without the aid of an architect will select the site and lay out the grounds without a thought of their qualifications for such work; and rarely will you find one frank enough to admit that he requires assistance in such matters, but should he entrust them to another, he will very probably say that he does not do the work himself because he has not the time. It is not to be expected that every one who builds will consult the landscape gardener, or even take into consideration the landscape at all. But I do not speak of those who have not the means to beautify or appropriately treat their dwellings or buildings, for landscape gardening means in every case a proportionately generous expenditure of money, which is made necessary by the fact that it takes time to make any grounds beautiful, and much time is required in many cases, in such as require that designs for the future must be made, for present effects are not always lasting, and often to produce future ones those of the present must be sacrificed. As much as I have in the beginning of my address be-rated that very useful quality, utility, it must be considered in the long run. Under the head of utility may be mentioned that were the landscape gardener consulted in the first place the money paid for his services would be no small part of the saving effected, for, taking advantage of the conformation of the grounds, he avoids expensive so-called improvements.

What is the occasion of the rectangularity of our towns, so rectangular that a curve would seem to be an offence? Surveyors lay out our towns and villages in checker-board fashion. Streets are projected in impossible places, building lots are often inaccessible and drainage is bad, making necessary an ant-like process or excessive expense to cut down the natural hills. These evils seem never to be at first noticed, or if they are they are not considered, because shortsightedness, under the name of utility, wishing to make the greatest number of lots, does not see that were the natural advantages of the ground considered our towns would be better in all respects instead of being ugly for all time. There is a possibility though that these matters may be more generally observed, and that the future holds out some hope, for fast as we have developed it the whole country is not yet quite subdivided.

THE PANAMA AND NICARAGUA CANALS.

THE Paris *Nouveau Monde* has an article on the subject of the present situation and respective advantages of the Panama and Nicaragua Canals.

The concession of the Nicaragua Canal was made by the Government of that State in 1887—that is to say, at the time when the embarrassed condition of the Panama Canal Company commenced to be known, but it was only at the commencement of 1889 that a company with a nominal capital of 100,000,000 dols. was founded by the canal executive under the title of the Maritime Canal Company of Nicaragua. This company immediately confided the works to another company, established at the same time as it, with a nominal capital of 12,000,000 dols., under the name of the Nicaragua Canal Construction Company. In September 1893 the Maritime Canal Company of Nicaragua suspended payment and was made bankrupt. In January 1894 an attempt at reorganisation was made, and at this period the state of the works was as follows:—

Three kilomètres excavated at 5 mètres depth; 330 mètres of dyke constructed on the Atlantic at Greytown, 17 kilomètres of railway, 92 kilomètres of telegraph line. Finally, the land has been cleared of timber on 32 kilomètres only.

The works, machines and interest paid represented at that date 7,300,000 dols., or about 1,440,000*l*. It does not appear as if the works had been continued since that time. In 1894 all the assets of the old company had been purchased for 2,970,000 dols. by a committee of reorganisation, which sought vainly to procure capital in France and England. This committee, since the foundation of the new Panama Company, has formed a company with a nominal capital of 12,000,000 dols.; that is to say, about equal to that of the new Panama Company. The promoters of this company have asked for a guarantee of interest from the Government of the United States, which guarantee has already been refused by the American Senate on two different occasions to the old company. The American Senate has just voted a law granting the financial aid of the United States for the construction of the canal, but before the final settlement this law has still to be approved by Congress.

The making of the Nicaragua Canal has elicited many very divergent expressions of opinion, and it has even been asserted that the canal was absolutely impossible, owing to the frequent earthquakes in the region. The strongest arguments which have been brought against the Nicaragua enterprise appear to be the following:—1. The Nicaragua Canal can only be a sluice canal. The Panama Canal, on the other hand, will be able gradually to become a level canal, and will be better adapted to a larger traffic. 2. The constructors of the Nicaragua Canal will be obliged to build a railway along the whole length, while the Panama isthmus enjoys the advantage of being already served by the Panama Railroad, the co-operation of which with the new company is assured. 3. The Nicaragua works are only commenced, and represent an expenditure of scarcely 1,400,000*l*., whilst those of the Panama Canal represent, at the lowest estimate, an expenditure of from 16,000,000*l*. to 20,000,000*l*. Finally, the new Panama Company, which has already made a large advance, has the period up to October 31, 1904, in which to finish the canal. As regards the terms of the Nicaraguan concession, the canal must be opened to navigation on November 10, 1900.

THE ROYAL SOCIETY OF ANTIQUARIES OF IRELAND.

THE Royal Society of Antiquaries of Ireland have arranged a tempting and extensive programme of meetings and excursions for the present year. During the week commencing May 6 meetings and excursions will be held at Kilkenny and Waterford, the Society visiting the latter place at the invitation of the Waterford and South-East of Ireland Archæological Association.

The principal meeting of the year will be held at Galway for the province of Connaught on Monday, July 8, and a series of elaborate excursions has been arranged in connection with this meeting, a principal feature of which will be the sea trip from Belfast to Galway. The steamship *Caloric*, one of the finest of the passenger steamers built in Belfast, has been chartered for the trip, which will occupy a week. The cabin contains first-class accommodation for one hundred passengers, half of whom will be provided with state rooms, and the table will be equal to that of the best hotel and at a very moderate inclusive rate. Before leaving Belfast an opportunity will be given to members to examine an extensive collection of Irish antiquities collected there, which will be on view in connection with the Industrial Exhibition.

The party will leave Belfast on Tuesday morning, July 2, and, passing Rathlin Island, off the Antrim coast, will visit Tory Island, off the coast of Donegal, with its round tower, and many Pagan and Christian antiquities. The noted Inismurray, off the Sligo coast, will next be visited, and the numerous interesting remains, so fully described and illustrated by Mr. W. F. Wakeman, will be examined with interest.

Iniskea and Inislora, off the Mayo coast, will meet with a full share of attention, and Clare Island and some of the other islands in Clew Bay will, if time and weather permit, be investigated. The steamer will anchor in Killery Bay, and an opportunity will be given of seeing this charming fiord. High Island, off the Galway coast, and St. MacDara's Island, will be visited, if time permits.

The Islands of Aran will be reached on Friday morning, July 5, and here the Belfast contingent will be joined by the members from Dublin and elsewhere, who may have been unable to undertake the trip from Belfast. The combined parties will land at Kilmurvey, a small bay on the east side of the North Island, and here the primitive church of Teampull Mic Duach will be examined. The ascent to Dun Aengus will then be made. This fort stands on the brow of an overhanging precipice, 302 feet above the level of the Atlantic, which surges at its caverned base. The walls are built in a horseshoe form on the summit; there are three enclosures or semicircles, the innermost wall being much the thickest; outside the second wall is a *chevaux de frise* of erect slender stones, averaging

about 3 feet high, which even yet present a formidable obstacle. The innermost enclosure or keep measures 150 feet from north to south, and 140 feet along the edge of the cliff; the enclosing walls, like those of the other forts in the islands, are composed of three distinct coatings or skin, and now measure about 12 feet 9 inches in thickness, and are still about 20 feet in height.

The other forts in this neighbourhood are Dun Onaght, Dun Eocha and, nearer Kilronan, Dubh Cathair, or the Black Fort, all of which present peculiarities of construction and many interesting details of entrances, chambers, stairs, banquettes in good preservation.

The group of ecclesiastical ruins near the north-western end of the island, called Teampull Breacain, or the Seven Churches, will next be visited. There are several inscribed stones here, one bearing the inscription "VII. Romani"—the Seven Romans—and another is in the Irish language. Around the principal church, which consists of a chancel and choir with semicircular choir arch, are the remains of monastic dwellings and a finely sculptured terminal cross.

On the road to Kilronan, which will be traversed on foot, the church of "the Four Beautiful Saints" will be examined and the four graves will be seen where these saints have been interred. Cloghauns, or stone-roofed houses and pillar-stones, occur here, and several groups of primitive churches will be met with on the way.

Oghill Fort, near the lighthouse, will also be taken. Teampull Soorney, and the church and crosses of St. Kieron, or the great Connaught Monastery, called Mainister Connaughtagh, and Killeany Round Tower will be visited, and from it the ascent to Teampull Benain will be made; this is considered the gem of early Irish churches, being only 10 feet 10 inches long in the clear and 6 feet 10 inches broad, and in its vicinity are the remains of a rude chancel containing chambers.

On Saturday, July 6, Inish Mann, or the Middle Island, and Dun Conchobhair, one of the most remarkable of the Aran forts, and which remains almost entire, will be visited. It is oval, standing on the edge of a steep cliff in the centre of the island, and is 227 feet long by 115 broad; the walls are 20 feet high and 18 feet thick at base. In the vicinity there are the ruins of several churches, saints' beds and holy wells, &c., which will be visited in detail. Kilcannanagh, a most complete and interesting cell of the sixth century, will be seen on the return journey. The saint's grave and his holy well adjoin the ruin. Two other churches, one dedicated to the Blessed Virgin and the other called "Teampull Seacht Mic Righ," or the church of the Seven Sons of the King, will finish the objects to be seen on the Middle Island.

The afternoon will be devoted to "Inis Oirir," now Innisheer or the south island. There is a huge dun in the centre of the island, inside of which is the Mediaeval castle of the Cluan Tiege O'Brien, a square tower, 43 feet by 26 feet at the base and 30 feet high. The principal antiquity on this island is the church of St. Kevin, consisting of a nave of the time of the saint, and choir with beautiful choir arch, probably of the twelfth century; the saint's bed is here also still reverently regarded.

This church, like one on Omev Island, and the church of Perranzabuloe in Cornwall, is liable during the presence of strong winds to be buried in the shifting sands which surround it. Fortunately, the wind from the contrary quarter empties it again, and the Board of Works, in whose charge it now is, have been lately devising some means to keep out the sand.

Another interesting church in this island is the seventh-century chapel of St. Gobnet, measuring 13 feet by 9 feet, with square-headed doorway and semicircular-headed east window.

When the ethnographical section of the British Association visited Aran in 1857, they were unable to take in the south island, which contains a great number of interesting remains very imperfectly known. The group of ruins known as "The Burial-place of the Seven" lies westward of the island, and is difficult of access. The name of the church or burial-place is not recorded.

On Sunday the "Claddagh," a primitive community, which until recently had its "king," will be seen, and for those who do not object to a drive on that day the Abbey of Clare-Galway will be visited in the afternoon.

On Monday, July 8, a trip will be made across Galway Bay to Ballyvaughan, from which vehicles will be taken to the Cistercian Abbey of Corcomroe, in county Clare, and the primitive church of Oughtamama will also be seen. A meeting will be held in the evening at the Railway Hotel, Galway.

On Tuesday the ancient town of Athenry, "the ford of the kings," with its ancient gateways, and the ruins of the Augustinian and Franciscan friaries and the castle, will occupy the morning, and in the afternoon the Cistercian House of Abbey Knockmoy will be visited. The members will proceed to Athlone in the evening.

The O'Connor Don, P.C., vice-president of the Society, has invited the members to visit Roscommon and Ballintubber, and the train will be taken at Athlone by the limited mail at ten o'clock A.M. for Roscommon on Wednesday, July 10, where

the castle and abbey will be visited, leaving Roscommon at one o'clock and arriving at Ballymoe at 1.40 P.M., which is distant from Ballintubber Castle about two miles. This castle was the seat of the O'Conors of Connaught for many centuries, and was the largest fortified residence in Ireland. The train will leave Ballymoe at 4.50 P.M. for Dublin and Athlone.

An excursion to the Loughcrew Hills, co. Meath, is arranged for Monday, August 5, and the Wexford meeting and excursions in that county will come off in the week commencing September 9 next.

LOW-LYING HOUSES IN LONDON.

THE following regulations have been made by the London County Council under section 123 of the London Building Act, 1894 (57 and 58 Vict. cap. ccciii.), with the concurrence of the Tribunal of Appeal, prescribing the course to be followed by applicants for permission to erect or adapt dwelling-houses on low-lying land.

Every person who shall be desirous of erecting or adapting any building to be used wholly or in part as a dwelling-house on any land in the county of London of which the surface is below the level of Trinity high-water mark, and which is so situate as not to admit of being drained by gravitation into an existing sewer of the Council, shall first make a written application for a license. Such application shall be addressed to the clerk of the Council.

Such application shall contain a statement as to the nature and extent of the interest of the applicant in the building or buildings proposed to be erected or adapted, and be accompanied by a plan and section of the lowest floor of such building or buildings and the curtilages thereof to a scale of $\frac{1}{2}$ of an inch to a foot, and by a block plan to a scale of not less than $\frac{2}{2500}$ (which may be on a sheet or sheets of the Ordnance Survey, or may be drawn on tracing linen), showing the position of such building or buildings and the local sewer into which it is proposed to drain such building or buildings, and the connection of such local sewer with an existing sewer of the Council.

Such plans and sections shall be accompanied by a description of the materials to be used in the construction of such building or buildings, and shall be coloured in accordance therewith. The points of the compass shall be marked on the block plan.

The position and course of the drainage system proposed to be adopted for the disposal of sewage and rain-water, and its connection with the local sewer or an existing sewer of the Council, shall be clearly shown on the plans and sections, and the diameter and inclination of the drain-pipes shall be figured thereon.

The plan and section shall also indicate in figures the level above or below ordnance datum at which it is proposed to construct the floor of the lowest rooms.

The decision given by the chief engineer of the Council upon such application shall be reported to the Building Act Committee, and the committee shall report it to the Council, and thereupon, if it is to the effect that the erection or adaptation may not be permitted, the clerk of the Council shall by letter inform the applicant that the Council, acting upon the decision of the engineer, has refused permission. If it is to the effect that the erection or adaptation may be permitted, a license under the seal of the Council embodying the conditions of the engineer's decision shall be issued to the applicant.

The following regulation has been made by the Council under section 122 of the London Building Act, 1894, with respect to the erection or adaptation of dwelling-houses on low-lying land:—

It shall not be lawful to place the underside of the lowest floor of any permitted building at such a level as will render it liable to flooding, and every permitted building shall be efficiently and properly drained to the satisfaction of the engineer for the time being of the Council, either into a local sewer or into a main sewer of the Council.

PROFESSIONAL ETHICS.

THE Boston Society of Architects have issued the following code of professional ethics, of which the use should not be confined to America:—

1. No member should enter into partnership, in any form or degree with any builder, contractor or manufacturer.
2. A member having any ownership in any building material, device or invention proposed to be used on work for which he is architect should inform his employer of the fact of such ownership.
3. No member should be a party to a building contract except as owner.
4. No member should guarantee an estimate or contract by personal bond.

5. It is unprofessional to offer drawings or other services on approval and without adequate pecuniary compensation.

6. It is unprofessional to advertise in any other way than by a notice giving name, address, profession and office hours, and special branch (if such) of practice.

7. It is unprofessional to make alterations of a building designed by another architect, within ten years of its completion, without ascertaining that the owner refuses to employ the original designer, or, in event of the property having changed hands, without due notice to the said designer.

8. It is unprofessional to attempt to supplant an architect after definite steps have been taken toward his employment.

9. It is unprofessional for a member to criticise in the public prints the professional conduct or work of another architect except over his own name or under the authority of a professional journal.

10. It is unprofessional to furnish designs in competition for private work or for public work, unless for proper compensation, and unless a competent professional adviser is employed to draw up the "conditions" and assist in the award.

11. No member should submit drawings except as an original contributor in any duly instituted competition, or to secure any work for which such a competition remains undecided.

12. The A.I.A. "schedule of charges" represents minimum rates for full, faithful and competent service. It is the duty of every architect to charge higher rates whenever the demand for his services will justify the increase, rather than to accept work to which he cannot give proper personal attention.

13. No member shall compete in amount of commission or offer to work for less than another, in order to secure the work.

14. It is unprofessional to enter into competition with or to consult with an architect who has been dishonourably expelled from the "institute" or "society."

15. The assumption of the title of "architect" should be held to mean that the bearer has the professional knowledge and natural ability needed for the proper invention, illustration and supervision of all building operations which he may undertake.

16. A member should so conduct his practice as to forward the cause of professional education and render all possible help to juniors, draughtsmen and students.

THE INTERNATIONAL RAILWAY CONGRESS.

THE International Railway Congress and Exhibition, to be held at the Imperial Institute from June 26 to July 9, is the first meeting of its kind in this country, and it promises to possess great interest for the railway world and not a little for the general public. Out of 20,000 odd miles of railway open in Great Britain, over 19,000 will be represented at the congress. Representation is based on the mileage worked—the larger the mileage the more numerous the representation. The initial contributions on any subject will not convey merely the opinion or experience of one man, but will take the form of reports by experts, who, having first submitted questions to railway authorities, subsequently analysed the facts thus gleaned. Mr. Frederick Harrison, general manager of the London and North-Western Railway Company, will report on the organisation of the central administration and outdoor staff, and the various systems of different countries. Mr. A. M. Thompson, M.I.C.E., signal engineer of the London and North-Western Company, will deal with the whole question of signals, introducing recent improvements in block and interlocking apparatus. The subject assigned to M. Sabourat, chief engineer of the central division of the Orleans Company, is "On places in permanent way requiring special attention to avoid the necessity of expresses slackening speed, and to prevent shocks in passing special points, such as sharp curves, long and steep gradients, facing points, road crossings, swing bridges, &c." Rolling stock for express trains will be spoken to by Mr. C. A. Park, carriage superintendent of the London and North-Western Railway. Special reference will be made to the type of rolling stock for express trains and long journeys, vestibule trains, improvements in internal arrangements and various modes of heating and lighting. Mr. William Hunt, chief engineer of the Lancashire and Yorkshire Railway, will deal with the question of the strengthening of permanent way in view of increased speed of trains. Mr. Henry Lambert, general manager of the Great Western Railway, has for subject the acceleration of the transport of merchandise, the influence of speed on the expenses of haulage, and the utilisation of railway stock on the one hand and the number of vehicles on the other. Mr. George H. Turner, general manager of the Midland Railway, will report on the arrangements as to shunting and handling of merchandise, &c., and mechanical and electrical plant in shunting and marshalling. M. A. Zanotta will deal with railway junctions and the best method of constructing these on express lines so as absolutely to avoid slackening speed, and the best

arrangement of points and crossings. The home railway companies are doing all in their power to make the congress useful to visitors from a distance, who will have the opportunity of inspecting the more important railway works throughout England and Scotland.

OXFORD COUNTY LUNATIC ASYLUM.

ON Monday morning, the 15th inst., a fire was discovered in the women's dormitory at the Oxford County Asylum at Littlemore, near Oxford. The outbreak took place in the south wing, which was occupied as the women's quarters, and was discovered by one of the nurses. Arrangements were instantly made for the conveyance of the patients, who numbered upwards of 300, to a place of safety, a task which was accomplished without injury or disturbance. Although the alarm was promptly conveyed to Oxford, considerable delay occurred before the engine could start, owing to the difficulty experienced in procuring horses; but by a fortunate coincidence the Blenheim fire brigade were engaged in a competition at Sandford, a village about a mile from the scene of the fire, and the call being conveyed to them they immediately repaired to the spot and rendered efficient service. It was evident, however, that the south wing of the asylum could not be saved, and the efforts of the workers were therefore confined to saving the adjoining buildings, a task in which they were successful. It is stated that the fire originated in the overheating of a flue in the upper portion of the building, and the damage is estimated at several thousand pounds. Two of the Blenheim firemen received slight injuries through falling from the second storey owing to the breaking of a ladder. One of the Oxford firemen was also disabled owing to some molten lead running off his helmet down his ear and neck.

HAVRE HARBOUR.

THE French Government publish a law giving power to the department of the Seine Inférieure, and to the Chamber of Commerce of Rouen and Havre, to raise 21,250,000 francs (850,000*l.*) towards making up a total of 42,500,000 francs (1,700,000*l.*) required for improvements to the ports of Havre and Honfleur and the course of the Seine between Rouen and Havre. The improvements proposed to be carried out by this Act are:—(1) The dredging of the south-west entrance of the port of Havre to a depth of 3 metres below zero of the charts; (2) new defences at the point of La Hove; (3) the formation of a new harbour outside the present port of Havre; (4) the opening of a dock entrance communicating directly with the basins Eure and Bellot; (5) the dredging of shoals in the Seine by Quilleboeuf; (6) the completion of dykes between Quilleboeuf and La Rizle, and their extension to Honfleur. Havre and the department of the Seine Inférieure advance 13,750,000 francs, Rouen 7,500,000 francs, of the total of 42,000,000 francs required for the works. The rest is to be a charge on the national exchequer. To meet this interest and redemption of the capital during 45 years, new tonnage and passenger dues to be substituted for those at present levied are authorised at Rouen and Havre.

GENERAL.

Mr. H. P. Burke Downing, we are pleased to find, has been appointed architect for a new school at Singlegate, Merton, for the Mitcham School Board.

A Design by Messrs. W. & J. B. Bailey, of Bradford and Keighley, has been adopted for the new Board schools in Tong.

M. Josso, architect, has been awarded the Prix Duc by the Académie des Beaux-Arts for the Musée at Nantes which was completed a few years ago.

The Tollhouse Trustees seek for aid towards the cost of securing and preserving the remains of the Grey Friars Cloisters, Great Yarmouth, and any other parts of the monastic buildings which may be offered for sale.

The London Geological Field Class will commence their series of Saturday afternoon excursions, under the direction of Professor H. G. Seeley, F.R.S., on the 27th inst., when they will visit Olford and Eynesford. Further particulars can be obtained from the general secretary, Mr. R. Herbert Bentley, 31 Adolphus Road, Brownwood Park, N.

A Wealthy Greek, of Alexandria, has offered half a million drachmas for the restoration of the ancient stadium or race-course, so that it may be used for the Olympic games to be held at Athens next year.

A Silk Exhibition has just been opened at the School of Art, Macclesfield.

Dewsbury Parish Church has been reopened after undergoing renovation and partial rebuilding, from the designs of Mr. Street.

The Architect.

THE WEEK.

THE loan collection of pictures which is on view in the Guildhall Art Gallery does not contain one example that is without interest. It is to be regretted, however, that the gallery is not worthy of its contents. The lighting is very defective, and in consequence of the peculiar shadows the young bride in the *School Revisited* sometimes appears to have grown more aged than was intended. Mr. SOLOMON has been so often made to suffer by the lighting in the Academy, he may be used to injustice, and will not murmur at the position assigned to his *Samson*. There are many works which, although lately exhibited, are not forgotten, such as Mr. CLAUSEN'S *Ploughing*, Mr. WATT'S *Fata Morgana*, Mr. LOGSDAIL'S *Gate of the Khalif, Cairo*, Mr. J. W. WATERHOUSE'S *Circe*, Mr. PRINSEP'S *Golden Gate*, Mr. PHIL MORRIS'S *Première Communion*. There are a few older works. The late H. O'NEIL'S *Eastward Ho!* was when first seen as popular as the *Roll Call* of a later time, and although the colouring looks strange beside modern works, there is a touch of nature about the picture which still appeals to the public. It is likely to be the most popular picture in the Gallery. Mr. FRITH'S *Claude Duval* set the fashion for Newgate heroes in English art, and on that account many will prize it. In the upper gallery pre-Raphaelitism and allied principles are represented. Mr. DANTE ROSSETTI'S *Prosperine* and other works will have special admirers. The *Scapegoat*, by Mr. HOLMAN HUNT, has a realism which no engraving of the work has expressed. For suggesting desolation it would not be easy to match it. But among the examples of the school Mrs. W. M. ROSSETTI'S *Romeo and Juliet in the Vault* is not surpassed for grace and tenderness. The *Turkish School*, by J. F. LEWIS, rivals any pre-Raphaelite example in its detail. But the picture in the room which is most delightful is the *Moorish Garden*, by Sir F. LEIGHTON. It represents a girl near cypresses and roses, and followed by a pair of peacocks. It may want the sculptural and decorative manner of the artist's later works, but it has a depth of colour and repose which they do not afford. *Sindbad in the Valley of Diamonds*, by Mr. A. GOODWIN, presents some of those startling effects which he loves, and he was never more successful. Mr. LAVERY'S *Ariadne* is vigorously painted, without coarseness or affectation of impressionism. Mr. ALMA-TADEMA'S *Pyrrhic Dance* and Mr. POYNTER'S *Catapult* suggest two modes of treating classic themes. PHILLIP'S *La Gloria* is rather commonplace as a subject, and the contrast between life and death is too emphatic. Lastly, we may mention *The Death of Chatterton*, a picture which was one of the wonders of 1856. Another room is devoted to several excellent examples of the Dutch school.

THE results of the examination of the air in some of the Board schools in Manchester and Salford were laid before the Sanitary Conference in Manchester on Wednesday by Dr. G. H. BAILEY. The observations were made in the summer months; the weather was such that the windows could be kept open the whole of the school time. Dr. BAILEY found even in the large rooms at Webster Street and Grecian Street Schools, which were the most favourably circumstanced, there was a distinct odour, whilst in the classrooms the air was very oppressive, giving rise to headache when it had to be endured for a period of half an hour together. At Lloyd Street, St. Stephen's and Granby Row matters were still worse; the excess of carbonic acid gas was as a rule 12 to 15 in 10,000, and the odour, in the classrooms especially, almost unbearable. On dull, moist days the temperature within and without was practically identical, and hence there was a very limited circulation; the air was then worse than on fine, clear days. On such days the odour was very pronounced. It was clear that even under favourable conditions the fresh air supply was too limited. Dr. BAILEY expects to be able to undertake similar observations during the winter. It would be well if he could also discover where fresh air is to be obtained, for when the outside air is as malodorous as the

air in the classrooms, without a purifying process it is not easy to see how an improvement can be insured.

AN allied subject that was treated at the same conference was the lighting of schools. Dr. E. JONES said he came to the conclusion that not even 5 per cent. of schools of all classes in Manchester and Salford would stand a moderate test of efficiency in lighting. Many of them seemed to have been built without the slightest regard to the use to be made of them by young and growing children. Not only short sight and weak sight, but also spinal curvature could be ascribed to defective lighting. The investigations of Dr. COHN, of Breslau, Professor PFLÜGER and other authorities who had investigated the subject were adduced to show the evils arising from the neglect of proper precautions as to the lighting of schools. Dr. JONES said that instances could be indefinitely multiplied of the grossest violation of the simplest rudiments of hygienic laws, and yet children were forced to attend under such conditions. It was surely time that an intelligent democracy should see the absolute futility of making the election of those responsible for school management a question of politics, or of whether a candidate was for church or chapel. What was wanted was to find intelligent men who appreciated and understood the laws of health, and who, at all costs, would see the laws were applied. There should be plenty of light, which should come from the left side. All the authorities were agreed that the best aspect for windows was east or west. He also urged the adoption of the electric light in schools. Dr. JONES appears to be assured that the cause of the evil is the lighting, but he would, we are sure, admit that all physicians who have investigated the subject are less certain about the conclusions.

COVERED markets are to be erected in Leek, and designs have been submitted in competition. Messrs. SUGDEN & SON, Leek, and Messrs. MOSLEY & ANDERSON, Northampton, early in the week addressed the members of the District Council, saying:—"We feel sure we speak for all the competitors, as well as for ourselves, in respectfully urging upon you the propriety of calling in expert advice to assess the merits of the various designs, a course now universally adopted in competitions which are intended to be placed above blame or suspicion. From your final instruction we submit competitors had the right to anticipate your eventually taking this course." At the meeting of the District Council on Tuesday the subject was considered, and the appointment of an assessor was proposed. Six members voted for the motion and seven against it, while four declined to vote. The motion was therefore lost.

THE wondrous little paintings by HANS MEMLING in the Bruges Hospital are comparable with any of FRA ANGELICO'S. It is a pity, however, that the keeper of the Art Library at South Kensington demolished the legend about HANS being a broken-down soldier, who in gratitude for his treatment in the hospital painted the pictures. Since Mr. WEALE established that the artist owned his own house in Bruges and was able to lend money to the Corporation, we are afraid fewer people care to see the shrine and the pictures which brought so much aid to the hospital in past years. Probably HANS MEMLING would have preferred that his works were judged by their merits, and not because he was imagined to be a hero of a romance. If the portrait in the Brussels Musée resembled him, there could not be a more unsoldierly man. Except the portrait, which was not his work, there is nothing to recall HANS MEMLING in that collection. It is no wonder therefore so much eagerness should be evinced about securing a triptych which is attributed to the painter, and is now possessed by a dealer in Paris. The price is 240,000 francs, and one-sixth of the sum has been subscribed by the wife of the Belgian Prime Minister. The triptych is on a larger scale than the majority of MEMLING'S works. On the central panel CHRIST is represented in a priest's vestments, while on the sides angels are seen in adoration. The triptych was obtained from a Spanish monastery, in which it appears to have escaped the notice of travellers.

RAPHAEL MENGES.

THERE are some artists who seem destined to be victims of prejudice even when they have passed away from this region of illogical judgments. RAPHAEL MENGES is one of them. REYNOLDS met him in Rome, and rashly assumed he was over-conceited. After several years had elapsed the unfavourable opinion remained, and when REYNOLDS attained the dignity of president of the Royal Academy he could gratify himself by endeavouring to make the students scorn MENGES as a type of a class that was to be avoided. In his sixth discourse he said :—

I remember, several years ago, to have conversed at Rome with an artist of great fame throughout Europe ; he was not without a considerable degree of abilities, but those abilities were by no means equal to his own opinion of them. From the reputation he had acquired he too fondly concluded that he was in the same rank, when compared with his predecessors, as he held with regard to his miserable contemporary rivals. In conversation about some particulars of the works of Raphael he seemed to have, or to affect to have, a very obscure memory of them. He told me that he had not set his foot in the Vatican for fifteen years together ; that he had been in treaty to copy a capital picture of Raphael, but that the business had gone off ; however, if the agreement had held his copy would have greatly exceeded the original. The merit of this artist, however great we may suppose it, I am sure would have been far greater, and his presumption would have been far less, if he had visited the Vatican, as in reason he ought to have done, at least once every month of his life.

The conclusion which REYNOLDS must have desired his auditors would draw from the anecdote was that MENGES was a sort of LUCIFER, who imagined he was more than a demigod, and equal to the greatest among the immortals in art. If he were, he expressed his opinions of his predecessors in an unusual way. It would hardly be supposed that MENGES was more reverential than the President himself. There are no passages in the "Discourses" in which RAPHAEL is mentioned which are as laudatory as those penned by MENGES. According to MENGES, the foremost rank among painters must be given to RAPHAEL, because he possessed the power of expression in a supreme degree, and it was found in all his works. In his figures he avoided all unnecessary action, and there is not a stroke of the pencil without its use in any of his paintings. RAPHAEL'S qualities, said MENGES, appeal to the mind rather than to the eye, and they cannot in consequence be appreciated until they are understood. His spirit was philosophic, and was not touched by little things, but by whatever was grand. Then he perceived the relations between the parts, and could express them in the way that was most striking to the spectator. There is the most sincere admiration of RAPHAEL'S genius to be found throughout MENGES'S writings. His criticism has, too, a precision which REYNOLDS has nowhere attained. RAPHAEL'S anatomical knowledge, skill in modelling, his chiaroscuro, treatment of drapery and his colouring are analysed with a closeness that is evidence of the most exact knowledge of the master's works.

It may be asked, How could MENGES, if he possessed so much knowledge, have refrained from visiting the Vatican for several years? In the first place, the failure to obtain an expected commission for copying one of RAPHAEL'S pictures would be a reasonable excuse for his absence. That a man like MENGES, who held a high opinion of his own inventive powers, was willing to copy a painting was a condescension, and the rejection of his offer must have brought him heartburning. REYNOLDS could be very touchy when his dignity appeared to be slighted, and he should have made allowance for a brother artist who was admitted to be supreme in Rome. There was another reason, of which REYNOLDS was not aware. Men do not always love the schools in which they were overworked. The Vatican was one of those schools for MENGES. From his infancy he was treated as a prodigy, who had only to be subjected to the hardest training and he must accomplish wonders. His father, who was a painter in enamel, anticipated a glorious future for his son, as he had conferred on him at the font the names ANTONIO and RAPHAEL, with the conviction that the child must one day unite in himself the genius of CORRÉGIO and RAPHAEL. ISMAEL MENGES resolved that nothing should be wanted on his part to ensure so desirable a consummation. The unhappy child was allowed to have no plaything but a porte-crayon. He was not taught to read until he could draw objects with accuracy. When he was six, young MENGES was

brought from his native village, Aussig, in Bohemia, to Dresden, and there the forcing system was carried on more rigorously. He was compelled to draw geometrical figures until he needed neither rule nor compass to produce right lines and circles. The O of GIOTTO would be insignificant to him. Other exhilarating studies followed, such as perspective, anatomy, light and shade, &c., while his father supplemented them by giving him instruction in chemistry. Then he was allowed to try his hand on enamels, miniatures and pastels. But the elder MENGES considered his son's training in the six years passed in Dresden was not sufficiently comprehensive, and when the boy was twelve he was conducted to the Vatican. If we remember rightly, one of the principles of the Pestalozzian system, especially when dealing with promising boys, was solitary confinement. ISMAEL MENGES anticipated it. In some mysterious way he was able to persuade the authorities to allow him to convert the Vatican into a prison. From early morning until an hour when drawing or painting was impossible through want of light, RAPHAEL MENGES was confined in one or other of the chambers, with no more provision than bread and water. He was able to endure for no less than three years continuously so exhausting a treatment. Then he was allowed to go back to Dresden for a short holiday. When it was ended he returned to Rome, and he resumed his studies under his father's supervision. His time was divided between the antique statues, the works of MICHEL ANGELO and RAPHAEL, and the anatomy school of a hospital. After four years of advanced studies he was considered competent to undertake the painting of a *Holy Family*. We may suppose RAPHAEL MENGES to have possessed a German's reverence for all that helped his own culture, but he must have been more than mortal if, as REYNOLDS desired, he could have visited the Vatican once a month. The fact was, MENGES'S acquaintance with the treasures of that palace was too complete. He was so versed in ancient ways, he found it difficult to allow his natural abilities any freedom. MENGES applied a Greek standard when judging all questions of form, and his own works were not exempted.

It is not impossible that the manner which gave offence to REYNOLDS, and which he supposed to be conceit, was merely an effort to explain how far the works of RAPHAEL, MICHEL ANGELO, CORRÉGIO and TITIAN, or later artists, were inferior to the works of the Greeks as an expression of the beautiful. The English artist was never enthusiastic about Greek art ; when he had to refer to the sculpture he spoke with restraint. He appeared afraid of being led astray by a sort of will-o'-the-wisp if he sought after ideal beauty. Accordingly he warned the student against speculations which "may make him neglect what is essential to his art, correctness of design, in order to pursue a phantom which has no existence but in the imagination of affected and refined speculators." MENGES was without any misgiving of that sort. He endeavoured to obtain a clear notion of the beautiful, of the cause of its appearance in visible things, of its effects and so on. MENGES could not pursue an inquiry of the kind without discovering how far beyond all other men the Greeks had advanced not in only formulating theories of the beautiful, but in realising it. The highest art he considered was an expression of the ideal, and as the Greeks succeeded with it beyond any of the moderns, they came nearest to a revelation of what is attainable by man. MENGES was not practised in psychology, and his efforts to find a basis for his creed in art are as remarkable as any that are recorded in the history of philosophy. His labour must have been painful, for he does not advise the young artist to pursue a similar process ; it will be easier, he says, to study masterpieces. Let the student, says MENGES, examine pictures by RAPHAEL, TITIAN and CORRÉGIO ; let him meditate over whatever he considers beautiful in each, and if in the productions of one of those masters he finds certain parts which are well thought out and well executed, he may conclude they were those over which the artist was mainly occupied and are the most characteristic. The recommendation of the earnest study of pictures by renowned masters hardly seems to indicate that the teacher was envious of their reputation or believed he was their equal or superior. REYNOLDS may have thought he was justified in prophesying a few years after MENGES'S death that the

artist's name would fall into "what is little short of total oblivion," but MENGES did not merit that fate by any exhibition of jealousy or presumption in his "Gedanken über die Schönheit und über den Geschmack in der Malerei," and judging by what many of his contemporaries said of him, his conversation was as free from littleness as his essays.

As we have said, MENGES possessed a code of laws which to REYNOLDS was like a sealed book. The President's ideal of the highest style was found in the works of the CARACCI—at least for the purposes of his discourses, for in his own practice he was faithful to one of a different class—while MENGES preferred the Greek sculpture which was to be found in Rome. From those examples he deduced a theory of the development of art. He fancied that sculpture came before painting, since it is easier to give a form to an object that is seen on all sides than to one that is represented on a flat surface. At an early period there were, he says, principles established; for if every artist followed his own caprice there would not be so close a resemblance between the proportions, and especially between the heads of the earlier figures. In the second period it was evidently perceived that figures were too commonly made meagre, and a massiveness that was often excessive was imparted to them. Refinement followed, and the group of the *Niobe* is cited as a work which possesses perfection in the proportions of the figures and a sublimity in the forms, but the contours are a little too rigid, and there is a want of that *morbidesse* and elegance which were common in the works of a later time. For those qualities MENGES believed the sculptors were indebted to the works of painters who had been also advancing. That for a time painting obtained pre-eminence of sculpture in Greece was inferred from a decree of PHILIP OF MACEDON, by which only freemen were allowed to receive instruction in the art. MENGES apparently was in favour of some restriction in the arts, for he said that the principal cause of the subsequent decadence arose from the immense number of artists to be found in Greece and Italy. When by wars and revolutions the patrons decreased, it became necessary to produce works of an inferior class to please the common people, in order to enable the artists to live. Art suffered in consequence.

MENGES was not satisfied to trace a general outline of the progress in art. He explained how the details of the figures were treated in the various periods. His conclusion was that with the Greeks there was a variety in the details, and especially in curves, which was not to be found in modern works. There was no man in the middle of the eighteenth century who possessed a more exact knowledge of the sculpture in Rome than RAPHAEL MENGES. When he spoke to REYNOLDS about keeping away from the Vatican, he was likely to mean that part only where RAPHAEL'S wall-pictures are to be seen. His acquaintance with the characteristics of the statues could only be attained by study that was always kept up. From his knowledge he was well fitted to give definiteness to the speculations of WINCKELMANN, for the germ of the best criticism in the "History of Art" is to be found in the essays by MENGES. That WINCKELMANN was allowed to believe a painting by MENGES—the *Jupiter and Ganymede*—was one of the most perfect examples of ancient art, and to publish a eulogy upon it, was carrying practical joking too far; but there is always a temptation to demonstrate the value of a critic's omniscience. The two men, however, remained in friendship, and exhibited it occasionally in ways that must excite amazement, and of which DAMON and PYTHIAS would never approve.

As a painter MENGES could not escape from the fastidiousness which unceasing study of masterpieces always produces. We have described the training to which he was subjected before he was allowed to undertake a picture. His *Holy Family* was a success. But his father believed that a further course of training would be an advantage for RAPHAEL MENGES, and compelled him to return to Dresden. When after a while the son appeared discontented with the endless preparatory toil, the stern father turned him out of the house, and RAPHAEL was left to shift for himself. As has often happened with young fellows in desperate straits, he married, his choice falling on MARGHERITA GUAZZI, who had served as model for the

Blessed Virgin in his *Holy Family*. AUGUSTUS III. fortunately took him under his protection, and appointed him first painter, an office by which he was provided not only with a salary, but with a house and a carriage. He was first employed on paintings for the side walls of the new chapel of the palace. The picture for the high altar he wished to paint in Rome, and he received permission from the king. While he was engaged on the work in Rome there was a collision between Saxony and Prussia, and one effect was the stoppage of the allowance to MENGES. The artist was in such distress he was glad to paint the vault of the Convent of the Celestines for the small sum of 200 piastres. Later on he painted the ceiling in the Villa Albani, the subject selected being *Apollo and the Muses*. He executed some other works in Rome, but as he had to compete with "miserable contemporary rivals" his life for some years was not enviable. Happily for MENGES he was invited by CHARLES III. to Madrid, and there obtained a salary of 2,000 doubloons, with a house and coach, besides all the expenses connected with any paintings he might execute. That was in 1761, and MENGES was then in his thirty-third year.

The trials of his youth and early manhood which he had sustained so manfully produced their effects as soon as prosperity arrived. MENGES became melancholy. He was allowed to return to Rome, where his family remained, and after a time he recovered sufficiently to become competent to paint the *Adoration of the Shepherds* and the *Christ Appearing to Mary Magdalen*. The former is in the Madrid Gallery, and is one of his finest compositions. He also painted in Naples portraits of some of the relatives of his patron. When his health was restored he returned to Madrid and completed the oil-paintings and frescoes which he had commenced during his first sojourn in the city. The climate of Madrid was not suited to his physique, and after a few years he was compelled to again seek health in Rome. There he remained until his death in 1779. A portrait of him was placed in the Pantheon, which described him as "Pictori Philosopho."

In the eighteenth century it was supposed to be doubtful whether nature could endow a German with taste. MENGES, who was immured in the Vatican in his twelfth year, and who spent the best part of his life in Rome, was more of a Roman than a German. Like WINCKELMANN, he was, however, a gage of what Germany was to become in art and aesthetics. As we have suggested, he was too much of a student—the pale cast of thought is over all his works. He believed that the Greeks owed their supremacy to their mastery of detail, and accordingly never touched a canvas or a wall with a pencil until he had made exhaustive studies of every part of a picture. After such preparations his ardour had cooled, and he commenced painting, as it were, in cold blood. There was always something of the enameller about his use of colour: he employed it like a man of science rather than a painter. Yet so severe a critic as BURCKHARDT does not hesitate to say that MENGES was the only artist of his time in whom the commencement of a more profound ideal view is visible. His ceiling at St. Eusebio is described as dignified and solemn, his work in one of the Egyptian rooms of the Vatican as a suggestion of the German monumental style, while his portraits are said to be more grand and true and less pretentious than any of those by his Italian contemporaries. His works in Spain have been no less admired. There are, however, few works by him in foreign galleries, and consequently his merits must be taken on trust. MENGES was a man with the loftiest aims, and he may have miscalculated his strength; but as an artist or a man he never deserved the censures which REYNOLDS expressed and which are calumnies.

Mr. G. Laurence Gomme has received a testimonial in recognition of his services both to the science of folk-lore and to the Folk-Lore Society, of which he and the late Mr. J. W. Thoms were the founders in 1878. Mr. Gomme retired from the presidency last year, and a movement was thereupon set on foot for presenting him with an illuminated address and a personal gift, and, at the same time, for starting a "Gomme Testimonial Fund" for the encouragement and assistance of research and study in folk-lore.

GLASGOW ARCHÆOLOGICAL SOCIETY.

A MEETING of the Glasgow Archæological Society was held on the 18th inst. Dr. James Macdonald presided. The Chairman said that the Council had unanimously resolved to recommend that Dr. David Murray be elected president till November, in room of the late Mr. C. D. Donald. This was unanimously agreed to, and Dr. David Murray took the chair.

Mr. F. T. Barrett read a paper on "Local Place Names available for the designation of Civic Wards." He remarked that two months ago the late President proposed that the Society should approach the municipal authorities with a suggestion that when the new wards into which the city was about to be divided were arranged, the official designation of such wards should be by names, instead of, as at present, by numbers, the names selected to be such as were associated historically with the localities included within each ward respectively. The practical advantage of such a change was obvious. A number did not of itself suggest any idea of locality, while a name known historically brought to the mind at once the quarter of the city indicated. What the Archæological Society was interested in was to maintain, as far as the changing conditions of the times would permit, all the associations which linked the present with the past. Until the delimitation of the new wards had been accomplished it would of course be premature to make any definite suggestion as to the names they might suitably bear; but it might not be improper, even at this stage, to inquire as to the existence of local names suitable for the proposed use. That Glasgow possessed a wealth of such names historically suggestive and racy of the soil was at once apparent. A list, somewhat hurriedly compiled, mainly from Mr. David Robertson's index to his edition of "Glasgow, Past and Present," gave three times the number required, and no doubt others would occur to members of the Society. The names were of several classes. There were the old communities which, formerly self-governing, had been incorporated with the city, such as Anderston and Gorbals; burghs of relatively recent date, as Crosshill and Hillhead; parochial and ecclesiastical divisions, as Barony and St. Andrews; estate names, as Blythswood and Kelvinside; important buildings, as Cathedral or Royal Exchange; historical and leading thoroughfares, as High Street, Bridgegate, or Cowcaddens; public spaces, as George Square or Queen's Park; districts named after individuals, proprietors and others, as Finnieston or Kingston. The imperfect list now submitted contained over eighty names. Of these, on a rough geographical analysis, sixteen belonged to the eastern districts, twenty-one to the central, sixteen to the western, eleven to the northern and seventeen to the southern portions of the city. It was obvious, therefore, that ample materials existed for giving to each of the twenty-five wards, when they were newly settled, a name at once familiar, historical and characteristic. In the east there were Bellgrove, Blackfriars, Bridgeton, Calton, Camlachie, Cathedral, Dalmarnock, Dennistoun, Drygate, Gallowgate, Garngad Hill, the Green, Molendinar, Parkhead, St. Andrews and Whitevale. Central—Barony, Blythswood, Bridgegate, Broomielaw, Candleriggs, Cowcaddens, Cross, Garnethill, George Square, Grahamston, Grey Friars, High Street, Jamaica Street, Rams-horn, Royal Exchange, St. Enoch's, St. George's, Saltmarket, Stockwell, Tolbooth and Trongate. West—Anderston, Burnbank, Cranstonhill, Dowanhill, Finnieston, Gilmorehill, Hillhead, Hyndlands, Kelvingrove, Kelvinside, Overnewton, Sandford, Sauchiehall, Stobcross, Woodside and Yorkhill. North—Cowlares, Keppochhill, Maryhill, Port Dundas, Possilpark, Rockvilla, Ruchill, St. Rollox, Sighthill, Springburn and Townhead. South—Camphill, Coplawhill, Crosshill, Crossmy-loof, Gorbals, Govanhill, Hutchesontown, Kingston, Langside, Laurieston, Paisley Road, Pollokshields, Polmadie, Queen's Park, Shawlands, Strathbungo and Tradeston.

Mr. Edwards said that the Act provided that the wards should be numbered; but the designations could be added to the numbers.

The Chairman remarked that difficulty could be easily overcome if the Town Council should think well of the proposal, seeing that they were going to Parliament every year.

Councillor R. Anderson said he was afraid that if it should be resolved to have designations there would be quarrelling over the names to be chosen.

On the motion of the Chairman a vote of thanks was awarded to Mr. Barrett for his paper.

Dr. James Macdonald read a "Note on the Excavation of a Roman Bath at Newfield, Dundonald, Ayrshire." Owing to unexpected difficulties that were encountered, Dr. Macdonald said the excavation was not so complete as was intended. It showed, however, quite conclusively that the basin could have been no bath either Roman or native, but was probably some provision for watering horses or cattle on the farm of Boghead. The paper was illustrated by drawings made on the spot by Mr. Emmet Brady.

The Chairman said that a more complete example of Jonathan Oldbuck's prætorium had never before come under his observation, for Dr. Macdonald's explanation of a horsepond being converted into a Roman bath was perfect. It showed that Sir Walter Scott, with his love of antiquity, and his clear and sound judgment, was very much alive to the manner in which the antiquarians of his day were imposed upon. Mr. Train, with a little imagination, had suggested a Roman bath; Mr. Chalmers put it into his "Caledonia," and the worthy parish minister of Dundonald had followed suit, but Dr. Macdonald's explanation of what it was was perfect.

THE LATE SIR GEORGE SCHARF.

THE country has lost an able servant by the death of Sir George Scharf, K.C.B., late director of the National Portrait Gallery, on the 19th inst. George Scharf, whose early work used to be signed "George Scharf, jun.," was, says the *Times*, the son of a Bavarian artist of the same name, who settled in London in 1816. He himself was born in London in 1820, and lived in England all his life; he was educated at University College School, and afterwards was a student at the schools of the Royal Academy. He early began to illustrate books, but before he had made any deep mark in that capacity he went to Lycia with Sir Charles Fellows, and occupied himself in making a very large number of accurate drawings, many of them in outline, of scenery and classical remains. These afterwards formed the basis of his illustrations to Sir Charles Fellows's book; the originals are now in the British Museum. In 1847 and 1849 he made two great successes with his illustrations of Macaulay's "Lays" and of Dean Milman's "Horace;" the original edition of the latter is now a scarce and costly book by reason of Scharf's beautiful drawings from gems and statues. Other books which he illustrated about that time or a little later were some of Smith's classical dictionaries and Mrs. Bray's "Life of Stothard." He soon, however, began to show that he possessed a real and rare talent for investigating the antiquities of art, as well as for practising art. He lectured at the Royal Institution, he wrote here and there an authoritative article, and in 1857, when the famous Manchester Art Treasures Exhibition was projected, Mr. Scharf was appointed art secretary. Already he was pretty familiar with the great English collections, but his official position gave him fresh opportunities, which he turned to excellent account. In the same year, 1857, the National Portrait Gallery was founded, and Scharf was very naturally appointed to be secretary to it, and practically had to form it from the beginning. To describe his method and his success, in spite of chronic difficulties with a parsimonious Treasury, would be to write the history of the National Portrait Gallery, which, coming into existence less than forty years ago, will presently on its migration to its new and splendid home behind the National Gallery be seen to have grown into a noble, extensive and representative collection. It is not too much to say that the collection owes its existence and almost all its development to George Scharf. Possessed of an eye of remarkable accuracy, of an extraordinary talent for testing likenesses, and of a still more extraordinary memory (which he habitually aided and kept in order by a vast series of sketch books), he had also two other highly important gifts. He was a student of history and literature, and he was, till physical infirmities came upon him, ready and eager to travel that he might extend his knowledge. In many great houses he had been an honoured guest for forty years, and his catalogues made long ago are still in essential points the authorities on such collections as that at Woburn Abbey and that which used to be at Blenheim. His historical knowledge was considerable—witness the elaborate and really learned letters on the "portraits of Mary Queen of Scots," which were printed from his hand at the time of the Tudor Exhibition. In the formation of such exhibitions his help was invaluable; he, as a member of the committee, was the general referee and court of final appeal in questions of a disputed attribution. But his life's work was the National Portrait Gallery. He watched it from the beginning; he was primarily responsible for the purchases made and for gifts accepted or declined, although, of course, the nominal responsibility lay with the board of trustees—a body chosen rather on grounds of eminent respectability than as likely to contribute much expert knowledge. It was in a great measure owing to Mr. Scharf's often urged plea of the dangerous nature of the old gallery at South Kensington that the portraits were moved some years ago to Bethnal Green, until a new gallery could be provided for them, a difficulty which, as is well known, was solved by the munificence of Mr. Alexander, who is said to have given something like 100,000% towards the building now on the point of being completed.

When Mr. Scharf reached his seventieth year, in 1890, remarkable and unexpected testimony was borne to his merits, and, indeed, to his indispensableness. By the new Treasury

minute he would have been compulsorily retired; but it was generally felt by the trustees and others in authority that, in the state of transition in which the affairs of the gallery then were, it was highly desirable that he should remain. Accordingly, a very strong memorial was sent in by the trustees, accompanied by letters from Mr. Gladstone and other leading men, which made it plain that in their opinion Mr. Scharf's gifts and qualifications were absolutely unique. He accordingly remained, though it was plain to any one who met him at exhibitions or in auction-rooms that his physical disabilities were growing very rapidly. His curiously unwieldy figure was a perpetual difficulty to him; every winter he was in imminent danger of dying of bronchitis; but he still fought on till his resignation only a very few months ago. He had been made a C.B. in 1882, and on his retirement he was made a K.C.B. and a trustee of the Portrait Gallery, the information of the Queen's intention so to honour him being conveyed in a most appreciative letter by the Prime Minister.

As we recently announced, Sir George Scharf is succeeded as director of the National Portrait Gallery by Mr. Lionel Cust, assistant keeper of the prints in the British Museum.

EXPLORATION IN PALESTINE.

DURING the winter months, when excavation becomes difficult or impossible at Jerusalem, Dr. Bliss received the sanction of the committee to undertake a journey to the Land of Moab, including the examination of Medeba, Kerak and other places of historical interest beyond the Dead Sea. Dr. Bliss had the special advantage of a letter of recommendation from His Excellency Hamdy Bey, the well-known director of the Museum of Constantinople. He was received most cordially by the Governor of Kerak, and was afforded the fullest permission to measure and make plans of buildings, to copy inscriptions, &c. After a journey of very great interest he got back to Jerusalem on April 2, and at once resumed the work of excavation. A preliminary report of his journey has been received, and full details will follow later. Dr. Bliss has discovered a previously unknown Roman fort and a walled town with towers and gates like the interesting town of M'Shita. The committee have appointed Mr. Archibald Campbell Dickie, architect, to go out and assist Dr. Bliss in the work, and especially in drawing plans, sections, &c. He has already arrived in Jerusalem. The excavations are costly, and funds are much wanted for their continuation.

PRIVATE HOUSES AS HOSPITALS.

IN Dublin the Vice-Chancellor gave judgment on the 17th inst. in the case of the Earl of Pembroke v. Mr. Graves Warren, Mrs. Elizabeth Shekleton and Mrs. Perry, which was argued during the last sittings. The Earl of Pembroke sought for an injunction to restrain the defendants from carrying on the business of an hospital in the house No. 28 Fitzwilliam Square, in breach of a covenant contained in a lease of June 27, 1822, from the then Earl of Pembroke to Clement Codd. The lessor's interest in the premises was vested in the present Earl, and the lessee's interest was vested in Mr. Warren, under whom the other defendants were sub-lessees. The covenant enumerated several trades or businesses which should not be carried on in the house, and concluded with the words "or any other offensive or noisy trade, business, or profession whatever." Lord Pembroke was the owner of the ground on which the house in question and the other houses in Fitzwilliam Square were erected; and he formed the plan of letting it for the erection of private residences with an enclosed pleasure ground, and in 1813 he obtained a private Act of Parliament, under which a body of commissioners was formed for the management of the square, and invested with the power of taxing the inhabitants for the payment of the necessary expenses and regulating the use of the grounds. All the leases, he believed, were similar to that in the present case, and the lessees were to erect the houses at their own expense. The entire nature of the lease in question and the circumstances under which the letting was made were, in his (the Vice-Chancellor's) opinion, strongly in favour of the existence of an intention on the part of the lessor that the houses should be private residences. The present case depended on whether an "hospital" came within the general words, "or any other offensive or noisy trade, business, or profession whatsoever." The object clearly was to prevent, as far as possible, the houses in the square from being converted to any purpose that might be offensive to or annoy the neighbourhood or depreciate the value of the property. The Vice-Chancellor then referred to the authorities bearing on the case, and to the affidavits made by residents in the square, medical men and others, from which it appeared that as soon as Mrs. Perry's intention to transfer the private hospital which she had previously conducted in a house in Harcourt Street to the house in Fitzwilliam Square was known, the residents in the

square and the commissioners protested against it and called on Lord Pembroke to interfere. Mrs. Perry was fully aware of the covenant contained in the original lease before she opened the house as an hospital on February 16 last. The affidavits of Messrs. North and Battersby proved that the use of the house as an hospital would seriously depreciate the value of the property of which it formed part. Admittedly the patients intended to be received in it would include surgical, medical and hysterical cases, and although the defendant had given evidence to show that the utmost care would be taken to exclude infectious cases, medical men who had given evidence for Lord Pembroke had stated that, in their opinion, it would not be possible to do so. He was of opinion, after a full and careful consideration of the whole case, that the act of the defendants, Mrs. Shekleton and Mrs. Perry, in setting up this hospital was a breach of the covenant in the original lease and should be restrained. He should therefore make the order for an injunction, but it should not come into operation until June 1, in order that the defendants might have an opportunity, if they desired it, of taking the opinion of the Court of Appeal on the case, and also to give Mrs. Perry time to make other arrangements for the carrying on of her business. He would reserve the question of costs.

TESSERÆ.

The Progress of Mediæval Architecture.

IN the architecture of all building nations, logical deductions follow one another with fatal severity. One step forward can never be the last, one must always go on; from the moment that a principle is the result of reasoning, it at once becomes its slave. Such is the spirit of the Western nations; it comes out as soon as the society of the Middle Ages begins to be conscious and to organise itself; it could not be checked, for the first man who founds a principle upon a course of reasoning cannot say to reason, "Thou shalt go no further." The builders in the shadow of the cloisters recognised this principle from the time of the eleventh century. One hundred years later they were no longer the masters of it. Bishops, monks, nobles, commoners, had they wished, could not have prevented the Romanesque architects from producing the architecture termed Gothic; the latter was only the predestined consequence of the former. Those who pretend to see in Gothic architecture, entirely secular, anything else than the emancipation of a nation of artists and artisans, who, having been taught to reason, reason better than their masters, and with the forces put into their hands carry them in spite of themselves very far from the goal that at first they wished to reach; those who believe that Gothic architecture is an exception, a caprice of the human mind, have certainly not studied its principle, which is but the rigorous application of the system inaugurated by the Romanesque constructors.

Sculpture in Pediments.

The practice had obtained among the sculptors and architects of Greece, in a very early period of the art, of introducing groups of statues to occupy the triangular space above the porticoes of the temples. The description in Diodorus Siculus of the sculptures on the pediment of the Temple of Jupiter at Agrigentum, representing at one extremity the Battle of the Giants and at the other the taking of Troy—the Twelve Labours of Hercules on the fronton of the Temple of Hercules at Thebes, by the hand of Praxiteles—the Calydonian Boar Hunt, described with so much detail in the 8th book of Pausanias, on the Temple of Minerva Alea at Tegara—those in honour of Bacchus and Apollo, on the two frontons of the Temple of Apollo, at Delphi, by the hands of Praxias, the pupil of Calarnis, and of Androthenes, the pupil of Eucadmus, both of them Athenian artists—but above all the magnificent Temple of Jupiter at Olympia, all these instances present a strong body of evidence that a building of the character of the Temple of Minerva at Athens would not have been left by Pericles with a bare pediment, and if Phidias did place any sculptures there it can hardly be doubted that they were amongst the most distinguished works of that artist and of his pupils. No subjects of ancient fable are more frequently alluded to in the poets and historians of Greece and Rome than the contest between Minerva and Neptune, the birth of the former and the battle of the Centaurs and Lapithæ. One instance of this nature bearing an immediate allusion to the present subject may be adduced from the 6th book of Ovid's *Metamorphoses*. The poet is relating the contest between Minerva and Arachne for the honours of the loom. The goddess is appropriately described as tracing upon her tapestry her former contest with Neptune for the honour of naming the capital of Greece. The subject of the tapestry is the same with that of the statues upon the temple. The goddess herself is represented producing, as the utmost effort of an imitative art, the same picture which already adorned her own temple in her own city.

English Brass.

Queen Elizabeth, in 1565, granted by patent all the calamine in England and within the English pale in Ireland to her assay master William Humphrey, and one Christopher Shutz, a German, and, as the patent sets forth, a workman of great cunning, knowledge and experience, as well in the finding of calamine as in the proper use of it for the composition of the mixed metal called latten or brass. With these patentees were soon after associated some of the greatest men in the kingdom, as Sir Nicholas Bacon, the Duke of Norfolk, the Earls of Pembroke and Leicester, Lord Cobham, Sir William Cecil and others, and the whole were incorporated into a society, called the Society for the Mineral and Battery Works in the year 1568. Mines of latten, whatever may have been at that period meant by the word, are mentioned in the time of Henry VI., who made his chaplain, John Bottwright, comptroller of all his mines of gold and silver, copper, latten, lead, within the counties of Devon and Cornwall; yet we are disposed to think that the beginning of the brass manufacture in England may be properly referred to the policy of Elizabeth, who invited into the kingdom various persons from Germany, who were well skilled in metallurgy and mining. In 1639 a proclamation was issued prohibiting the importation of brass wire, and about the year 1650, one Demetrius, a German, set up a brass work in Surrey, at the expense of 6,000*l.*, and about 8,000 men are said to have been employed in the brass manufactories which were established in Nottinghamshire and near London. Yet Sir John Pettus, in his account of royal mines, published in 1670, observes that these brass works were then decayed, and the art of making brass almost gone with the artists. But though the art was then almost gone, yet it was never, after its first establishment, altogether lost, for about the year 1708 we find that there were brass manufacturers in England, and that they presented a memorial to the House of Commons, setting forth several reasons for continuing the brass manufactory in this kingdom, and soliciting for it the protection of Parliament. In this memorial they stated that England, by reason of the inexhaustible plenty of calamine, might become the staple of brass manufacture for itself and foreign parts; that the continuing the brass works in England would occasion plenty of rough copper to be brought in, and make it the staple (in time) of copper and brass; that the Swedes had endeavoured to subvert the English brass manufacture by lowering the price of Swedish brass wire, inveigling away workmen and other means. In compliance with the purport of this memorial, an Act of Parliament was passed in the same year by which the former duties payable on the exportation of copper of the produce of Great Britain, and of brass wire, were taken off, and these articles were allowed to be exported free of duty. In 1720 it was remarked that this nation could supply itself with copper and brass of its own produce sufficient for all occasions, if such duties were laid on foreign copper and brass as would discourage their importation, and at the same time encourage the sale of their own metals.

The Domestic Chimney.

The strongholds which were erected about the period of the Conquest consisted of several storeys, and their roofs were used as a terrace for defence, thereby rendering the central hearth and opening impracticable; but as it was necessary to provide some exit for the smoke, the fireplace was made in the wall, and terminated in a loophole on the outside; this was an important step towards the construction of the chimney. Conisbrough and Rochester Castles furnish examples of this contrivance, which prevailed, without much variation, from the twelfth to the fifteenth century. Until the latter period the chimney, properly so called, appears to have been little known in England, or indeed in many other parts of Europe. The ancient Romans seem not to have been acquainted with it; and there is no trace of it in Italian houses up to the fourteenth century, by the middle of which it had become common at Venice, for an inscription over the gate of the school of Santa Maria della Carita states that in the year 1347 a number of chimneys were thrown down by an earthquake. We learn also from Muraton that in 1368 a prince of Padua, on making a journey to Rome, took with him masons to make a chimney at the inn at which he put up, "because in the city of Rome they did not then use chimneys, and all lighted the fire in the middle of the house on the floor." But, as Mr. Turner remarks, in seeking to ascertain the antiquity which should be assigned to chimneys, facts are often at variance with the statements of respectable writers. Existing remains prove that perpendicular flues were constructed in England in the twelfth century; yet Leland, writing in the sixteenth century, speaks with surprise of a chimney in Bolton Castle, which he says was "finiched or Kynge Richard the 2 dyed." One thynge I much notyd in the hawle of Bolton, how chimeneys were conveyed by tunnells made on the syds of the walls betwixt the lights in the hawle, and by this means, and by no covers, is the smoke of the harthe in the hawle wonder strangely conveyed." We can only suppose with Mr. Turner that the

principle of the modern chimney was understood long before the construction itself became general. The cost of remodelling the house would in very many cases prevent the improvement. In drawings of the time of Henry III., chimneys of a cylindrical form are represented rising considerably higher than the roof, and orders to raise the chimneys of the king's houses are frequent in this reign. Nevertheless, it was still the general custom even in the fourteenth century to retain the hearth in the middle of the room. When the wood was fairly ignited the smoke would not be great, and the central position of the fire was favourable to the radiation of heat. This method of warming the hall was continued long after fireplaces with chimneys had been erected in the smaller apartments. By the reign of Elizabeth the advantages of the new system were so well appreciated that ladies in their visits to their friends, if they could not be accommodated with rooms with chimneys, were frequently sent out to other houses, where they could enjoy the luxury.

Fuseli's Aphorisms.

Some enter the gates of art with golden keys and take their seats with dignity among the demi-gods of fame, some burst the doors and leap into a niche with savage power, thousands consume their time in chinking useless keys and aiming feeble pushes against the inexorable doors. He who pretends to have sacrificed genius to the pursuits of interest or fashion, and he who wants to persuade you he has indisputable titles to a crown, but chooses to wave them for the emoluments of a partnership in trade, deserve equal belief. Distinguish between genius and singularity of character; an artist of mediocrity may be an odd man; let the nature of works be your guide. Know that nothing is trifling in the hand of genius and that importance itself becomes a bauble in that of mediocrity—the shepherd's staff of Paris would have been an engine of death in the grasp of Achilles; the ash of Peleus could only have dropped from the effeminate fingers of the curled archer. Genius may adopt, but never steals. All mediocrity pretends. Sensibility is the mother of sympathy. How can he paint beauty who has not throbbled at her charms? How shall he fill the eye with the dew of humanity whose own never shed a tear for others? How can he form a mouth to threaten or command who licks the hereditary spittle of princes? If you wish to give consequence to your inferiors answer their attacks. Michel Angelo, advised to resent the insolence of some obscure upstart who was pushing forward to notice by declaring himself his rival, answered, "Chi combatte con dappochi, non vince a nulla:" who contests with the base loses with all. Genius knows no partner. All partnership is deleterious to poetry and art—one must rule. Art among a religious race produces relics; among a military one, trophies; among a commercial one, articles of trade. Modern art, reared by superstition in Italy, taught to dance in France, plumped up to unwieldiness in Flanders, reduced to "chronicle small beer" in Holland, became a rich old woman by "suckling fools" in England. The colours of pleasure and love are hues. The invention of machines to supersede manual labour will at length destroy population and commerce, and the methods contrived to shorten the apprenticeship of artists annihilate art. "Sineret se plebeculam pascere," said Vespasian to the artist who had contrived a machine to convey some large columns with a trifling expense to the Capitol, and rewarded him without accepting his offer. Expect no religion in times when it is easier to meet with a saint than a man, and no art in those that multiply their artists beyond their labourers.

Public Buildings in India.

The Madras Government proposed the erection of the Lawrence Asylum in 1863-64, at a probable cost of 18,000*l.*, and commenced it without plans or estimates, which were six times called for by the Government of India, and were, when at last (1867) received, found to amount to more than five times the sum originally named, it being at the same time stated that 13,000*l.* had already been expended on "preliminary work." The Secretary of State in 1867 censured the Madras Government for having, "in total disregard of the most familiar rules of the Public Works Department, incurred an expenditure greater than any Local Government could sanction on mere preparations for a further and much greater expenditure, which make the work one beyond the sanctioning power of even the Government of India." He declined to consent to this excessive expenditure, and ordered the substitution of a less expensive project. His peremptory order produced a revised estimate which, together with the expenditure already incurred on preliminary work, the Government of India sanctioned. The whole sum thus sanctioned was 52,000*l.*, but the sanction was so much waste paper, for in the following year (1870) the Madras Government showed an expenditure of 83,000*l.*, stated that this would not nearly suffice, and forwarded a new estimate amounting to 118,000*l.* The Government of India refused sanction to this estimate and stopped the works. The Bombay Government in 1865-66 proposed to build a Government House

near the city of Poona at a probable cost of 35,000*l.*, and this sum was granted by the Government of India "on the express instructions" that the amount should not be exceeded. Two years later the Bombay Government forwarded estimates amounting to 96,000*l.*, and in doing so told the Government of India that "the work had already progressed too far to render any stoppage possible with a view to any material revision of the design." The Government of India "severely animadverted upon" these proceedings, and at once reported them to the Secretary of State, but would not order any stoppage of the works "in consequence of the inconvenience which would have been occasioned to the Governor of Bombay." The Secretary of State then expressed to the Bombay Government (March, 1868) his "entire concurrence" in the censure passed by the Government of India, and his regret that the control over the expenditure of public money, by law imposed upon that Government, should have been "practically set at naught." This censure had merely the effect of bringing into stronger relief the determination of the Bombay Government to set all control at naught, for work called "subsidiary" went on without sanction until the expenditure had risen to 155,000*l.*, and then it was stated that the account would be closed, but this closing did not put an end to the expenditure.

Roman Glass Mirrors.

The Romans, before the time of the Younger Pliny, not only used glass instead of gold and silver for drinking vessels, but they knew how to glaze their windows with it, and they fixed it in the walls of their rooms to render their apartments more pleasant. Now a piece of flat glass fixed in a side of a room is a sort of looking-glass, and if the stucco into which it is fixed be of dark colour it will not be a very bad one. And hence the Romans could not fail of having a sort of glass specula in use, but this, though admitted, does not come up to the point; the question is whether they covered the posterior surface of the glass with a metallic plate. It has been observed that the Romans knew how to make a plate of gold and quicksilver. It appears from Pliny also that they knew how to beat gold into thin leaves and to apply it in that state both on wood and metal. There is, too, a passage in Pliny from whence it may be collected that the Romans began in his time to apply a coat of metal to glass specula, and that this coat was of gold. The passage occurs in the very place where Pliny professes to finish all he had to observe concerning specula. An opinion, says he, has lately been entertained that the application of gold to the back part of a speculum renders the image better defined. It is hardly possible that any one should be of opinion that a plate of gold put behind a metallic speculum could have any effect in improving the reflected image, but supposing Pliny (whose transitions in writing are often abrupt) to have passed from the mention of metallic to that of glass specula, then the propriety of the observation relative to the improved state of the image is very obvious. If we suppose the Romans in Pliny's age to have simply applied some black substance to the back surface of the glass, or even to have known how to put tin behind it, yet the observation of the image being rendered more distinct by means of gold might have been made with more justice than is generally supposed. Buffon is of opinion that a looking-glass made with a covering of gold and quicksilver would reflect more light than one made in the ordinary way with tin and quicksilver, and hence Pliny's expression, "*Certioorem imaginem reddi auro appposito aversis*," will be accurately true. Alexander Aphrodisius flourished towards the end of the second century; he wrote several works in Greek, and amongst the rest two books of problems. One of his problems is this, "Why are glass specula so very resplendent?" The only part of the answer which we are concerned with is, "Because they besmear the inside of them with tin." The Greek word does not clearly point out the manner in which the operation of fixing the tin upon the glass was performed. Pliny uses a Latin word (*illitum*) of exactly the same import as this Greek one when he speaks of copper vessels being tinned, and as in that operation tin is melted and spread over the surface of the copper, there is no difficulty in supposing that the tin may have been, in the time of Alexander Aphrodisius, melted and spread over the surface of the glass when previously heated.

Thomas Hope.

The author of the "History of Architecture," "The Costume of the Ancients," "Anastatius" and other works, travelled in early life over various parts of Asia, Africa and Europe, and, having acquired a facility of drawing, brought home a large collection of sketches, principally of the architecture and sculpture of the different scenes through which he had passed. Soon after his return to and settlement in London he wrote and printed "A Letter, addressed to F. Annesley, Esq., on a Series of Designs for Downing College, Cambridge," in which he notices some of the countries he visited and the architectural

objects he examined as a justification of his motives for criticising the series of plans, elevations, &c., then submitted to him. These criticisms were so poignant and condemnatory of Wyatt's designs that they were rejected, and Wilkins was afterwards employed to commence the college. Purchasing a large mansion in Duchess Street, Mr. Hope devoted much time and study, not only in finishing and fitting up the interior from his own drawings, and partly in imitation of the best specimens of ancient and modern buildings in Italy, but made designs for the whole and for the furniture of the house. Consisting of a picture-gallery, a statue-gallery, drawing-rooms, dining-rooms, cabinets for vases, &c., which he had collected in his travels, this house became an object of popular and fashionable attraction. The drawings which he had made for his furniture, &c., he afterwards published in a folio volume, which led the way to a complete revolution in the upholstery and interior decoration of houses, and also called forth the splenetic comments of the *Edinburgh Review*. Whatever ridicule a literary critic might attempt to cast on the work and on the pursuits of a private gentleman thus engaged, it may be said to have proved truly innocuous; whilst the effects of Mr. Hope's publication and example have been extensively beneficial. They gave occupation, at the time, to many young and aspiring artists, they roused the young to emulation and employed and remunerated the skill of others advanced in life. The genius of young Chantrey was called into action and excitement, whilst the more mature talents of Flaxman were honourably employed. Many artisans as well as artists were awakened to exertion, and were also brought out from the haunts of obscurity and comparative wretchedness and placed in the daylight of patronage and respectability. Mr. Hope declared that he frequently traversed obscure alleys, lanes and courts to find out and employ men of skill and talent in their respective pursuits. "In forming my collection and in fitting up my houses," said Mr. Hope, "my object has neither been an idle parade of *virtù* nor an ostentatious display of finery. I have observed with regret that most persons employed in our manufactures, or in furnishing our habitations, are rarely initiated even in the simplest rudiments of design, whence it has happened that immense expense has been employed in producing furniture without character, beauty, or appropriate meaning." "The Costume of the Ancients," 2 vols. 4to, consisting of 130 engravings in outline, was mostly illustrated from Mr. Hope's own drawings.

The Hour-lines of the Ancients.

The hour-lines on the sundials of the ancient Greeks and Romans correspond to the division of the time between sunrise and sunset. An example of these hour-lines occurs in an ancient Greek sundial forming part of the Elgin collection of marbles at the British Museum, and which there is reason to believe had been constructed during the reign of the Antonines. This dial contains the twelve hour-lines drawn on two vertical planes, with one inclined to each other at an angle of 166 deg., the line bisecting that angle having been in the meridian. The hour-lines actually traced on the dial consist of such portions only as were requisite for the purpose the dial was intended to serve, and these portions are sensibly straight lines. If these lines are continued through the whole zone of the rising and setting semi-diurnal arcs, they will be found to be curves of double curvature on the sphere. The lines indicating the third and ninth hours of the ancients are found by the bisection of all the rising and setting semi-diurnal arcs, commencing from the southern point, where the meridian cuts the horizon, and proceeding till the line reaches to the first of the always apparent parallels, which being a complete circle meets at the end of its first quadrant. At this point the branch of another and similar curve is continuous with it, namely, a curve which in its course bisects another set of semi-diurnal arcs, belonging to a place situated on the same parallel of latitude as the first, but distant from it 180 deg. in longitude. Continuing to trace the course of this curve along its different branches, we find it at last returning into itself, the whole curve being characterised by four points of flexure. If the describing point be considered as the extremity of a radius, it will be found that this radius has described in its revolution a conical surface, with two opposite undulations above and two below the equator. The right section of this cone presents two opposite hyperbolas between asymptotes, which cross one another at right angles. This cone varies in its breadth in different positions of the sphere, diminishing as the latitude of the place increases. The cones, to which the other ancient hour-lines belong, are of the same description, having undulations alternately above and below the equator, but they differ from one another in the number of the undulations, and some of them require more than one revolution to complete their surface. The properties of the cones and lines thus generated may be rendered evident by drawing the sections of the cones on the sphere in perspective either on a cylindrical or on a plane surface.

NOTES AND COMMENTS.

LITHOGRAPHY in London is only recognised as one of the useful arts; in Paris it is esteemed as having as much claim to be esteemed a fine art as etching, or as the best work in black and white. DELACROIX, DECAMPS, FRANÇAIS and other famous painters were glad to employ the process, and many artists continue to imitate them. As a consequence, finer lithographs are produced every year in Paris than elsewhere. It is therefore right that the centenary of the art which occurs this year should be celebrated in Paris, although ALOYS SENEFELDER, the discoverer, was a native of Prague. It is proposed to hold a great exhibition of lithography in the galleries of the Champ de Mars from August until the end of November. Ministerial patronage for the undertaking has been secured. In consequence, the finest examples in the public collections can be obtained, and many amateurs have also offered the choice of their portfolios. On the committee are several painters and other artists.

It is intended to arrange the immense antechamber, which resembles a guard-room, on the first floor of the Ministry of Foreign Affairs in Paris as a sort of museum. Various objects will be shown having a relation to the transactions of the department. In addition to historic documents it is expected that a collection of medals will be obtained which are memorials of various events, as well as commemorative paintings, tapestries, pottery, engravings, &c. The room is lighted by an immense window, which opens on the Seine. It is to be filled with a scene from the life of Cardinal RICHELIEU, executed by a new process. The artist, M. ALFRED BETTAMIER, employs red, blue and yellow glass. He tones the colours by acids when necessary, and he obtains his effects by superimposing the pieces, a transparent cement being used. He claims to be able to obtain harmonies of colour which are not practicable by the ordinary process, and the experiments have secured the approval of good judges. There are no lead lines to break up the picture, and in consequence there can be freedom of treatment. Many supposed improvements in glass-painting have been set aside when their novelty ceased to attract, and it has yet to be proved whether M. BETTAMIER's process, however excellent it may be for producing gradations of colour, will make more satisfactory windows than the paintings on immense sheets of glass which the Italians have sent to exhibitions, and which are like very luminous window-blinds.

THE miller who brought and won an action against FREDERICK THE GREAT for interference with his property was probably not braver than the honest Queensferry merchant and his wife, whose action against the Prime Minister has been decided in the Outer House of the Edinburgh Courts. Lord ROSEBURY wished to erect a memorial hall for the benefit of the people of Queensferry, and to obtain a site purchased a house in the High Street of the royal burgh, which has become interesting through the Forth Bridge. It was alleged that he interfered with the plaintiffs' boundary-wall and with their gable, both of which they maintained were their property absolutely. In other words, neither wall nor gable were supposed to be in the same category of mutual ownership as party-walls. The judge decided that the gable was at least mutual property, but his lordship considered that from its height and the use which was made of it on one side and from the position of the chimney-stack, the "skew" and the way the tiles were bedded in the "skew" on the memorial hall, while the slates of the plaintiffs' house were only brought as far as the face of the wall, all seemed to show that the gable was Lord ROSEBURY's property and that the plaintiffs' had only in it a servitude or easement over the gable. As regards the boundary-wall it was decided to be mutual property, and therefore there was no right to open doors in it. All the parties in the suit may claim to have been victorious. Whether the opening of the doors in the wall does not involve grave consequences has yet to be determined, and also how the costs are to be divided. Sticklers for Scotch equity would say that a case of the kind should be allowed to drag its slow length along many a session. It resembles the Queensferry case we read

of in "The Antiquary," which the innkeeper described as "a ganging plea that my father left me, and his father afore left to him. It's about our backyard—ye'll maybe hae heard of it in the Parliament House, Hutchinson against Mackitchinson; it's a weel-kenn'd plea; its been four times on afore the fifteen, and deil onything the wisest o' them could make o't, but just to send it out again to the Outer House. O! it's a beautiful thing to see how lang and how carefully justice is considered in this country." The High Street gable case ought to be of still more importance and it should be honoured accordingly. There are debatable points in it on which all the wealth of the merchant and his wife might be expended.

It is not often there is any tribute of respect paid by clergymen or laymen to the memory of an architect. On that account the words employed by the Rev. Canon AUSTEN at a vestry meeting of St. Hilda's, Whitby, are the more remarkable and deserve to be recorded. The church was designed by the late R. J. JOHNSTONE, of Newcastle-on-Tyne. The Canon said it was one of the special privileges of his life to have under his charge such a noble edifice. Everyone admired it and every succeeding generation would appreciate the magnificence of the structure. People came to Whitby from far and near in no inconsiderable numbers for the express purpose of looking at and examining the church, and all expressed themselves to the effect that it was the work of a great mind. Recently two gentlemen, who were experts, and who from their official position were able to speak with confidence and authority, had examined the building, and they spoke of Mr. JOHNSTONE's work in that church in terms such as any man might be proud of. It was a church which for design and execution could not be surpassed, and brought Mr. JOHNSTONE to the top of the tree in his profession. It was Mr. JOHNSTONE's last work, and he expended a great amount of his strength and energy upon it, and in future years it would be pointed out as one of the best examples of the Gothic style of ecclesiastical architecture there is in this country. Every architect who has seen St. Hilda's Church will admit that Canon AUSTEN's praise was not exaggerated.

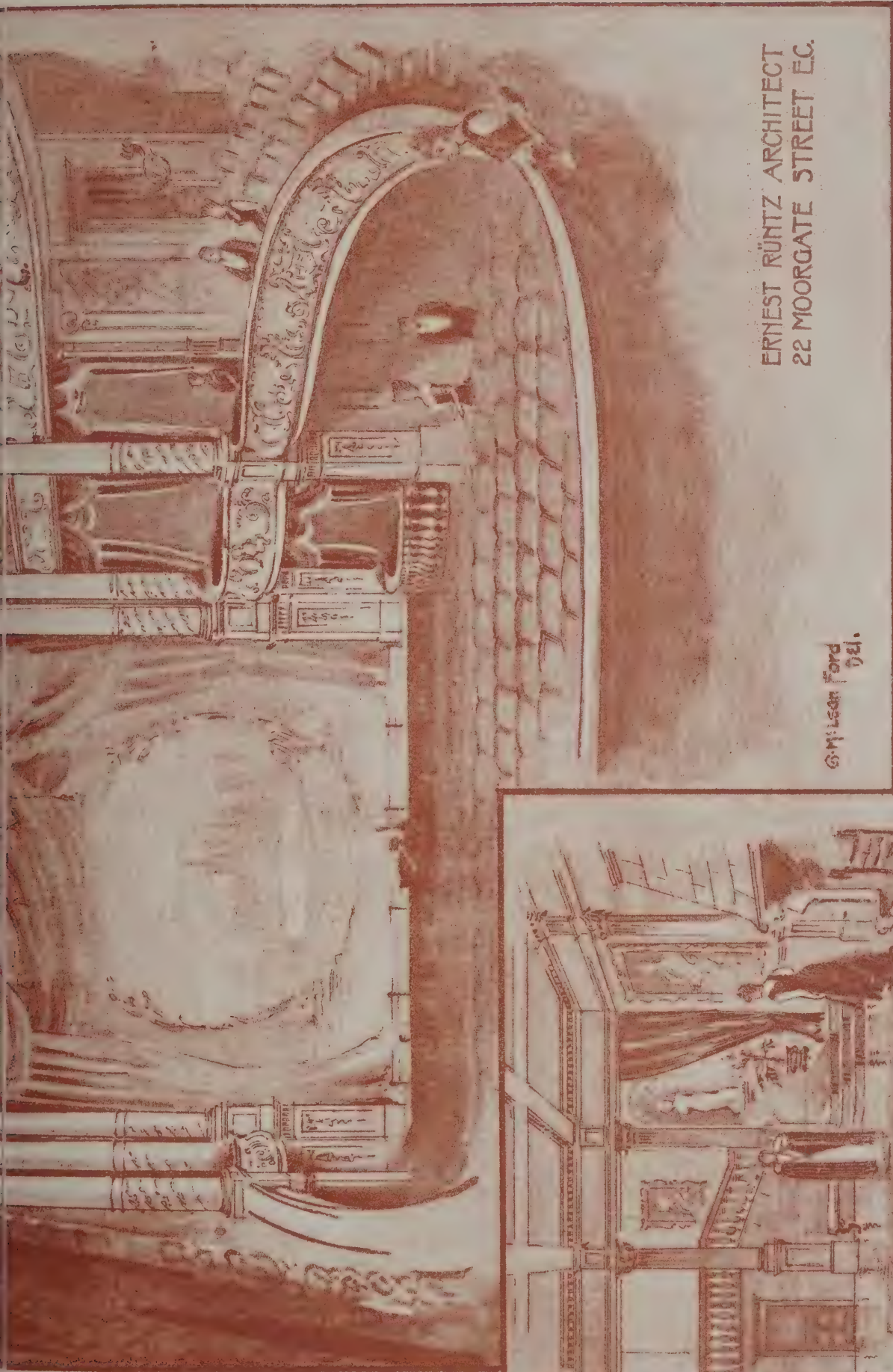
THE Governors of the Glasgow and West of Scotland Technical College, having had their attention drawn to the success of the courses in architecture and building construction conducted by Mr. GOURLAY, have recognised the desirability of both recognising this success and strengthening the department by raising the lectureship into a professorship. Mr. GOURLAY, having submitted that he was willing to devote his whole time to the work of the department and to conduct day classes in architecture, a chair of architecture and building construction has been created, and Mr. GOURLAY was appointed as its first occupant. The distinction was well merited, for we have often had to note the success of the architectural and building classes. One of the Professor's first duties was to conduct the students over Glasgow Cathedral on last Saturday, and to explain to them in the building many points which he had referred to in his lectures during the session which is now drawing to a close. The students evinced much interest in what they saw. Attention was also drawn to the various Renaissance monuments in the cathedral and churchyard.

THE "Architect's Certificate Forms" and "Architect's Order Forms for Extras and Additions," published by Mr. SAVORY, of Cirencester, have several advantages. Certificates and orders are numbered, and every one can be thus accounted for. Past payments can be shown. The builder's receipt is also found on the same page as the certificate. The foils are sufficiently ample to allow of duplicate entries. There is also an index-form in each book. The order forms will enable an exact record to be given of extras and additions. As certificates and orders are always liable to be produced in law courts it is well to have them prepared in a way that will satisfy judges and jurors as well as clients. It can be claimed that the new forms will sustain that sort of test successfully.

The Architect. April 26th 1895.

NEW
THEATRE ROYAL
CAMBRIDGE.

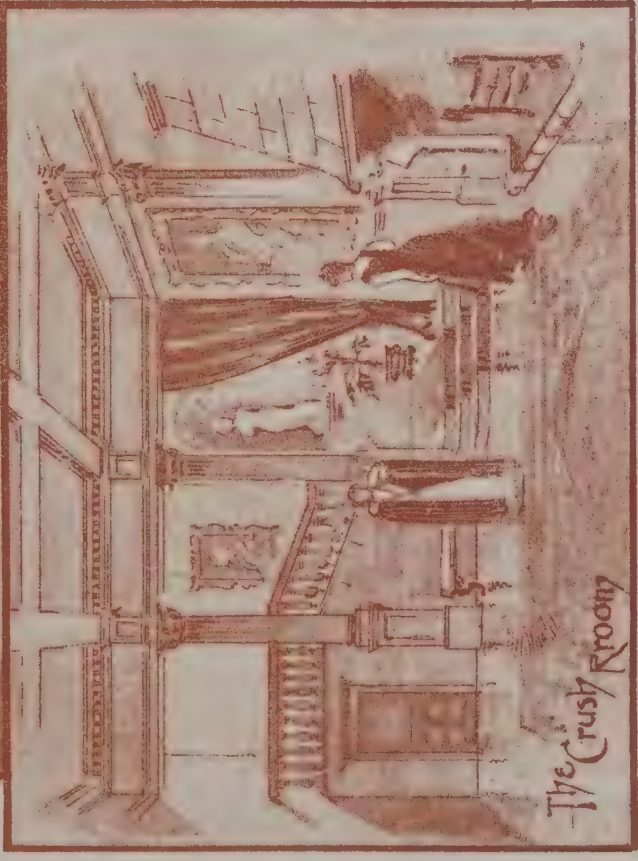




ERNEST RÜNTZ ARCHITECT
22 MOORGATE STREET E.C.

G. Milson Ford
Del.

INK. PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, PETER LANE, E.C.



The Crushy Room



PHOTOGRAPHED BY BEDFORD LEMERE & CO

April 26th 1895.



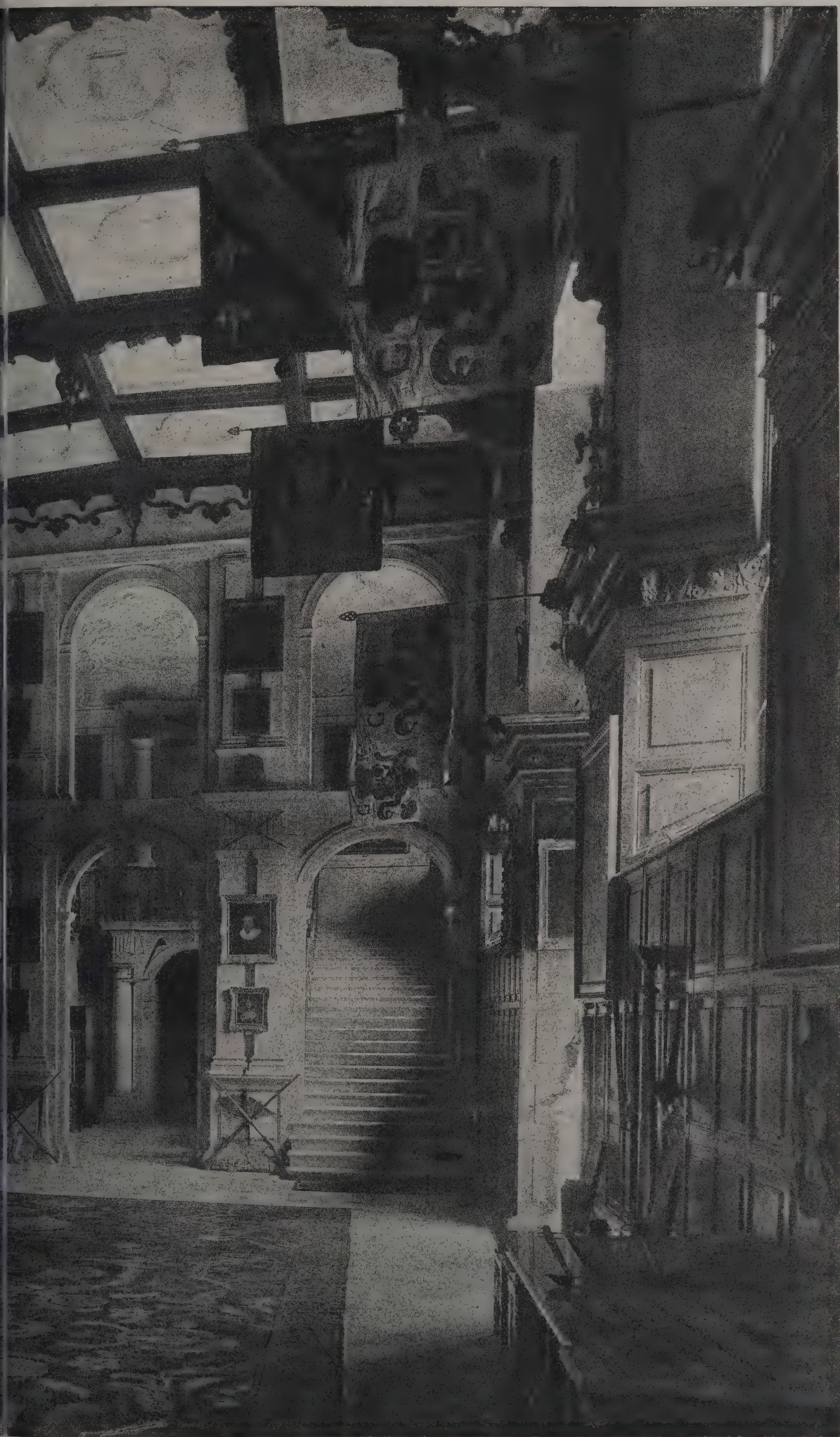
INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

NGNIDDRY, N.B.
chitect.



PHOTOGRAPHED BY BEDFORD, LEMERE & CO

April 26th 1895.



1895 PHOTO SPENCER & CO. 15 EAST HERRING STREET, FETTER LANE, E.C.

POLEY END, ESSEX.

ILLUSTRATIONS.

NEW THEATRE ROYAL, CAMBRIDGE.

THE present theatre was opened to the public in November, 1882, and has continued under the management of its founder, Mr. W. B. REDFERN, to provide accommodation for touring companies visiting Cambridge up to the present time. The Theatre Royal was adapted by Mr. REDFERN for its purpose at a time when dramatic performances were not allowed to be given during term time, except on rare occasions at the Guildhall, and, thanks to careful and judicious management, the theatre soon became recognised as worthy of support and encouragement. The late Duke of CLARENCE, while a student at Trinity College (and then known as Prince EDWARD), was a regular patron of the theatre, and both dons and undergraduates, together with the townsfolk, have continued to attend the performances in large numbers. Many a past member of the University will look back with kindly recollection upon the building which in a few weeks will have ceased to exist.

The growing demand for theatrical entertainments has led Mr. REDFERN to convert the theatre estate into a limited company, with the object of pulling down the old building and erecting a theatre of modern type, with all the latest possible improvements, and affording accommodation for a much larger audience, embracing the middle-class population hitherto uncatered for.

The new building will accommodate upwards of 1,400 people, special provision having been made in the interest of the undergraduates and University audience. There will be pit and stall area, dress circle and gallery, with ten boxes. The stage will be 64 feet across, and have a depth of 38 feet. In the rear will be nine spacious dressing-rooms, cut off from the main building, and with separate emergency exits.

The approaches from St. Andrew's Street are to the pit and gallery, and there is a separate entrance for stalls and for grand circle and boxes, the two latter leading into large crush-rooms, with which the usual offices communicate. Three saloons are provided, two on the area level and one on the first tier. Care has been exercised in arranging the numerous exits, of which there are no less than ten.

The old theatre will be pulled down in the early part of June, and it is anticipated that the new building, of which Mr. ERNEST RÜNTZ is architect, will be ready for occupation immediately after Christmas next, as the plans have received the approval of the Cambridge Town Council.

GOSFORD HOUSE, LONGNIDDRY, N.B.

HALL, AUDLEY END.

IT is believed that Audley End was commenced in 1616, and when completed it must have excited extraordinary admiration. Some of its novelty must have been worn off when PEPYS saw the mansion in 1659-60. He relates how "the housekeeper showed us all the house, in which the stateliness of the ceilings, chimneypieces and the form of the whole was exceedingly worth seeing." Seven years afterwards the Secretary again visited Audley End, and the effect of time on his mind as well as on the building is suggested by what he wrote in his Diary:—"The house indeed do appear very fine, but not so fine as it hath heretofore to me; particularly the ceilings as I always took them to be, being nothing so well wrought as my Lord Chancellor's are; and though the figure of the house without be very extraordinary good, yet the staircase is exceeding poor." In 1669 Audley End received COSMO III., Duke of Florence, with his suite. In the account of the Duke's travels there is the following description of the place:—

Descending into the valley below by an easy acclivity, we came to a spacious avenue planted with elms of considerable height, which terminated at the mansion. The entrance is into a quadrangular court; the sides are surrounded by porticoes of stone which, extending with perfect regularity to the distance of several bowshots, enclose a large meadow. The balustrade which runs round the court is formed on the one side of the letters which comprise the following words, "Sapi-entia est in consilio fortunam semper habere," and on the other with those of the motto belonging to the arms of the Order of the Garter. The interior of the house consists of many apartments, well propor-

tioned and judiciously disposed, and of a well-lighted gallery ninety paces or more in length, having a ceiling of stucco adorned with arabesque and walls lined with wainscot, which is the custom in all houses of the English nobility, as a protection against the cold. The architecture of the palace, although it was built sixty years ago, is nevertheless not regular, but inclines to the Gothic mixed with a little of the Doric and Ionic. The materials of which it is composed are brick, the ornaments of all kinds are splendid and entirely of stone, and the roof of lead. Upon the roof is a gallery, in the midst of which rises a small cupola containing a clock, the sound of which proclaims to a great distance the magnificence of this vast fabric.

Although more than two centuries have elapsed since the foregoing description was written, it is still applicable, for Audley End has been less altered than many buildings of the same age.

SOCIETY OF ARCHITECTS.

A MEETING of the Society took place on Tuesday, Mr. E. J. Hamilton, president, in the chair. The nomination was announced of Dean Farrar, D.D., as hon. member of the Society.

Mr. HENRY LOVEGROVE read the following paper, entitled

Housing the People in London and the Provinces.

Mr. Lovegrove at the outset remarked that the subject was a vast one, and important enough as a question of decent habitation for labourers in a village, but more so in the vast province called London. Legislation, he said, has done much to improve the dwellings of the people, but there is a limit, as if regulations are made too stringent it would be impossible to supply shelter for the poorer classes at all.

Firstly, a few words about the people, beginning as I shall do when considering their dwellings at the bottom and working upwards. Improve the dwellings of these poor wails, the extremely poor, but what of the people themselves? Go and see them in their wretched homes, often one room, and that a kitchen in the back addition of a house originally built for one family. The mother is dirty and untidy, the children are filthy, the bed in the corner is unfit for occupation, the walls and ceilings are nearly black, and the father if at home is a miserable dejected creature, looking little better when away, as if you meet him in the streets he is usually very dirty, slouching along smoking a short pipe, and should he perchance ride in a tramcar or other public conveyance in which he cannot smoke, he amuses himself by expectorating every few minutes to the great discomfort of his fellow-passengers. Now these people being as I have briefly described, and as I frequently see them in my official round, we may well consider what can be done for them, as they would make the best model dwellings filthy in a few weeks. People of this class swarm in many districts in London, and being so plentiful it is a marvel that our Government allows this country to become the sink of Europe, by admitting without question hordes of foreign paupers more disgusting in their habits than the native article, and more likely to break the law, as the records of Worship Street and the Thames Police Court will show, a large portion of the business being connected with the foreign element. Shelter must be found for the lowest and poorest, and the nearest available appears to be a house which, like its fellows in the same street, was originally constructed for one family, with one water-closet of antiquated pattern in the yard and one small sink. In this house three or four families congregate, and as a result the death-rate is very high, and weakly children grow into men and women wanting in stamina. These people are too poor to pay for decent rooms in model dwellings, and it appears impossible to deal properly with them as regards the provision of suitable homes.

We next, he said, have to consider a better class, the wage earning, and it has been the fashion for several years past to build so-called model dwellings for their accommodation. One great mistake has been the pulling down of a number of small two-storeyed dwellings, often with long gardens, and the erection of lofty structures of four or five storeys, so close together that the light is insufficient and the sunlight is unknown. This covering of every inch of land will be prevented in the future by the London Building Act, 1894, which requires that any plans for model dwellings not fronting a street must be submitted to and approved by the County Council, a most excellent regulation. For the erection of blocks of dwellings the land must be cheap, and the return for the investment will be much less than on small houses, large companies with ample capital and long experience being unable to make more than 5 per cent. on the capital. Many dwellings erected by ordinary speculators have been anything but model in their arrangements, indeed it is a wonder that the speculating builder ever touches them, as the average money-lending solicitor will not make the advances so essential to keep the jerry-builder on his legs. The provision by public

bodies of well-planned and well-built dwellings would add very much to the rates, as the income from the rents would not cover the interest on the money expended, and desirable as it may seem for public bodies to undertake such work, the trader and professional classes must be considered, as upon them the heavy rates really press, the rich man, with his large income, not feeling the extra, while the class below cares nothing for rates, theirs being paid by the landlord, who can only get the value of the house, no matter what his outgoings may be by way of rates. But, at whatever cost to the ratepayer, something must be done, especially where large areas are cleared for public improvements. A general rule cannot be laid down to place the provision of dwellings in the same category as the erection of public baths and washhouses, technical schools, public libraries and similar structures for the use and entertainment of a people growing in education and culture. All these things, while necessary or desirable, should fall on the public purse; it ought not to be necessary, as is proposed in Wales, to rob an ancient church of its property for such schemes.

Passing for a moment from the consideration of model dwellings, we consider the usual two-storeyed house, four rooms in the main building and one or two rooms in the back addition. Houses of this type are built in the cheapest possible way; the whole of the walls are one brick thick, the timbers are of the smallest possible scantling and there are many discussions with the district surveyor concerning the use of bats, and of old mortar rubbish for mortar to lay the same. The planning is utterly bad, the frontage much too narrow, the whole being arranged as if for one family. There are many instances of each floor being arranged as a separate dwelling, so that there are no squabbles as to the right to use a common kitchen. Some years since I planned a number of houses two storeys high, each floor complete, and they were built by contract, costing nearly 50 per cent. more than a speculative builder's price, but the superior arrangements and fittings secured good tenants. It must be remembered that the speculative builder employs anybody who can work, so is not troubled by that curse of these days—the trades unions and their tyrannical dictation. I cannot help thinking that small blocks, each to contain six complete dwellings, would pay well if erected in a suitable locality. There would be less of the barrack appearance about them, and not so many stairs to climb.

During the last few years a new departure in the planning of terrace houses of the rental value of from 40% to 50% per annum has proved a great success. Mr. Knightley called attention to them. I had previously seen some erected and shortly after was able myself to put the idea into practical shape. Instead of the back room of the house being placed so that it is darkened by the back addition, the drawing-room is placed in the back addition, the back room in the main building being the kitchen, the space between the back addition of this and the adjoining building being enclosed and covered with a glazed roof to form a scullery. It must be obvious to anybody who has seen many houses that it would be much better if basements could be entirely dispensed with and a wider frontage given, so as to dispense altogether with the ugly back additions, and if the so-called gardens could be a few feet longer, so much the better for the tenants.

The requirements of the London Building Act as to areas at the rear of buildings, the 10 feet clear space and the much discussed angle of $63\frac{1}{2}$ degrees, will be of immense benefit to the people of London. When a rental of from 45% to 60% is reached the builder must be careful to build the right kind of house or his success will be doubtful, as these tenants are very particular; many have good taste and require a miniature mansion. There must be no downstairs rooms, generally called a half-basement; the hall must be tiled, and stained-glass in low quality glazing must give style if not exactly beauty. If the house is what is usually known as double fronted so much the better. The plans exhibited show a very popular kind of house. I know of one estate on which houses similar in plan but inferior in elevation have sold before the first floor joists have been fixed.

I shall deal but briefly with houses of the value beyond 60% per annum, as such people can usually select their residential locality, and can often purchase a house. The same remarks apply to the many blocks of flats for the middle and upper classes. It seems odd that houses of any size cannot be built to let at a remunerative rental, and I have myself proved by a costly experiment that houses built by contract after tender will not sell for what they cost. They must be built in large numbers in the cheapest possible way. Kindly bear in mind the fact that I have come in as a stop-gap, and had to make my notes in a very short time with many other matters pressing. We shall, I am sure, watch with much interest the development of any movement which will assist in the ever-increasing difficulty of providing proper and decent homes for all classes, at prices within their means. We have seen dwellings on a large scale erected by the Industrial Dwellings Company, the Peabody Trustees and others, and we

await the completion of the several schemes now in progress under the control of the London County Council, especially as to the cost per room or at per foot cube, taking into consideration the extra conveniences which may be provided in addition to mere dwelling-rooms. Many provincial towns have made fair progress in the provision of dwellings for the wage-earning classes, but rural districts are still badly off, the sleeping accommodation in labourers' cottages being deficient, and owing to the impoverished condition of the farmer and the squire there is no money to spend on improvements.

A discussion followed, in which the President and following gentlemen took part:—Messrs. G. H. Guillaume, B. R. Tucker, J. R. Manning, W. Allport, H. G. Quartermain and C. A. Bassett-Smith.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute of Architects was held on Monday evening, Mr. Penrose, president, in the chair.

The Use and Abuse of Marble for Decorative Purposes.

Professor AITCHISON, A.R.A., alluded to the various kinds of stone classed as marble, and referred to the distinctive qualities and beauty of that material. The Greeks seemingly chose it mainly on account of the perfection to which it could be worked and the delicate modelling it would express, and the Italians followed in their footsteps. Coloured and variegated marbles were in high favour among the Romans. Enormous quantities were used by them. The country-house of the Gordiani in one single portico had 200 columns, and in the same villa were three basilicas having 100 columns each. The greater part of the marbles used in the palaces, churches, &c., of the Dark Ages and early Mediæval days were taken from the ancient Roman buildings. In modern times many of the quarries which supplied the ancients have been rediscovered and new ones have been opened. The great drawback to the use of flowered marble for columns that bear weight was its liability to flaws and defects, and the shafts should first be tested by the hydraulic press. With regard to the internal use of marble in England it looked and felt cold in winter, and when buildings were not warmed it condensed the damp. Marbles mainly formed of carbonate of lime were useless externally, as the polish rapidly perished. The use of marble for decoration was to colour harmoniously by means of a particularly beautiful and specially coloured material. The finer flowered sorts had in their colouring every sort of motive and caprice that could astonish and charm. The Professor then described the colours of different marbles and referred to the imperishable coloured decorations to be obtained by inlaying. Monumental colour was as hard to get as monumental form. The safest course was to adhere to one colour, or to some strong contrast of two colours, such as black and white, dark purple and white or dark green and white. Black and white for columns, balustrades and walls had a dignified effect, but the white should greatly predominate, or the effect would be too funereal. If an effect of richness, magnificence, or gorgeousness, or of delicacy or loveliness were required, the same rules held good in marble as in painting. For a white or a light ground, with colour interspersed, the other colours should be very light, or bright colours in small pieces; while for a dark or low-toned ground white or very light tones should be sparingly used. The Professor then laid down certain maxims as to the employment of flowered marbles, and recommended for study in the use of coloured marbles the Pantheon, St. Mark's at Venice, St. Sophia and other buildings, describing the effects there obtained by different schemes of colour treatment. Such use of marble, however, should only be attempted by those who possessed the rare gift of being able to harmonise colours, and had perfected that gift by study, observation and trial. The Professor concluded by referring to a "Vision of Paris," by M. Charles Garnier, and expressing the hope that it might be realised in London.

Mr. William Young, who followed Mr. Aitchison, said that his remarks, based upon his own experience and observation as a working architect, would be confined to the use of marble in interiors. The employment of that material, which had been almost entirely absent in English architecture, had developed enormously in recent years; but the question presented itself, Did we always use it in the best way and in the right place? The true use of marble meant something more than merely lining walls with slabs of that material, set in courses marked off by horizontal and vertical joints after the manner of the marble wall-papers with which the walls of the passage and stairs of every ordinary house used to be covered. In marble as in other materials the architect should follow a certain order and scheme to bring out his design. The labour of the hewer, the sawyer and the polisher revealed the beauties of marble; thought and skill must be added to make it beautiful in architecture. To explain his meaning the author referred to the arrangement of the marbles represented in Mr. Alma-Tadema's

picture *The Roman Bath*. For use in a large way marbles should be few, but well chosen. With three or four different marbles handled by a master there was nothing within the range of architectural art, from simplicity to magnificence, that the architect could not accomplish. In selecting marbles for columns, arches, &c., it was sometimes exceedingly difficult to get the particular type wanted to insure perfect harmony. Instances within the author's own experience were cited. Columns should be constructive, and not planted on for decoration; if possible, they should be monoliths. Square pillars should be solid marble, and not brick cased with marble slabs jointed to imitate solid masonry. The marble on walls, where solid blocks would be useless waste, should be so treated as to show that it was a lining. Ordinary box-marble chimney-pieces, consisting of slabs of marble placed one in front and one on each side, as though to give the appearance of a solid block, the author considered not to be a true use of marble, and not architecture. With regard to the question, Should colour follow form? the author was of opinion that there was much sound truth in Mr. Ruskin's dictum that colour should be visibly independent of form, although in actual work it was found that colour, as a rule, must follow form. There were, however, exceptions. Instances and reasons in support of both views were shown and explained by the author by the aid of photographs of existing buildings, and the conclusion arrived at that a true and intelligent medium should be observed. The author next discussed the question *where* to use marble. If the *where* was wrong, the *how* could never be right. One thing was certain: marble had not been used in the present day where it ought to have been used. Largely employed in clubs and restaurants, in fish-shops and shop-fronts, in our churches marble was conspicuous by its absence. It would be well if modern architects would endeavour to see their work as their successors would see and criticise it with regard to the use of marble. A forecast of such criticism the author would try and put before them by imagining himself at a meeting of architects in the year 2395 to hear a lecture on "The Use, Non-use and Abuse of Marble in the Architecture of England at the End of the Nineteenth Century," in which the hypothetical lecturer deals with the lavish use of marble in palaces, club-houses, mansions, halls of amusement, &c.; its abuse in drinking saloons, &c.; its non-use in Government buildings, where it would appear to have been prohibited by law; and—strange anomaly—its complete absence in the churches of the period, where only dingy brick and plaster were found, and sometimes a cheaper kind of stone sparingly used.

Mr. BRINDLEY (Farmer & Brindley) then read a short paper, being notes he had prepared.

Mr. ALMA-TADEMA proposed a vote of thanks to these gentlemen, which was seconded by Mr. G. Simonds, sculptor, and the hour being late, the proceedings terminated by passing the vote unanimously, which was acknowledged in a few words by Mr. Aitchison.

A NEW RACE IN EGYPT.

ON the 17th inst. a lecture was delivered before the Edinburgh Royal Society by Professor W. M. Flinders Petrie on "A New Race in Egypt."

The Professor began by describing the district which he had been exploring. It was about thirty miles north of Thebes on the western side of the Nile, between two stations known as Negadeh and Ballas. The Nile Valley was a gigantic trench cut through a plateau of limestone. On an examination of the plateau near Thebes, which was 1,400 feet above the present level of the Nile, they found the top of it strewn with the remains of paleolithic man. Hitherto the remains of these flint-workers had only been known in Egypt among the lower gravels. It was, therefore, matter of great interest to find that the top of these great cliffs of limestone were really the home of the paleolithic man at a period when the Nile, swollen by the great rains to which this region had been subjected, rolled in a mighty flood eight or nine miles in width and over 100 feet in depth. Examples of the flints found on the plateau were thrown on the screen by means of the limelight, and were shown to be of the same shapes as were got in the drift in Europe, viz. leaf-shaped and triangular, but whereas those got in the gravel were rounded by the action of water and by rolling, those on the plateau were perfectly untouched and perfect, just as they had left the hand of paleolithic man. Smaller flints were also found of a later period bordering on the neolithic age. That was one point which had been cleared up this year at the place they had been staying. He went to this place because he had seen there the remains of an untouched small Egyptian temple and town—untouched so far as antiquities were concerned. On clearing away the remains he found it had been dedicated to the god Set, the worship of which had been proscribed because the god represented the spirit of evil. In earlier days the Egyptians worshipped the gods Set and Horus, who were

brothers; but latterly, for the reason stated, Horus alone was worshipped. This continued until the eighteenth dynasty, or about 1550 B.C. In this temple was found a sculptured slab with a symbolical representation upon it of the god Set, with the head of some mythological animal giving life to the king. Nothing was found of the late Greek occupation, but the Professor remarked that the finding of this town called Nubt or Ombos explained an obscure passage in the fifteenth Satire of Juvenal. Another town known as Nubt was rendered by the Greeks as Ombos, now Korn Ombo. But it was this recently found Nubt-Ombos which Juvenal refers to in his fifteenth Satire as being next to Tentyra, for Dendera is the nearest city to this on the north. The satirist described the rivalry between the two places, so that the inhabitants of one felt a profound horror for the temples and idols of the other. Beside the classical interest of it, the town was of great value as preserving the remains of many successive ages. At the bottom of it was pottery precisely like that found in northern Egypt of the fourth dynasty. Above it was pottery the same as that of the twelfth dynasty, and above that pottery like that of the eighteenth and nineteenth dynasties in northern sites. Hence there is proof that the varieties of style already traced were not merely local but extended widely over the country. Pictures were shown of vases and various implements which were found under the foundations of the temple, the date of which was referred to the time of Thothmes III., and the Professor gave an interesting statement on the significance of such implements being put into Egyptian tombs and under the foundations of temples. The pottery in question, found in successive layers, he further explained, had been of great importance in another respect, inasmuch as it had enabled them in some degree to confirm their views of dates in ancient Egyptian history, which they were endeavouring to spell out from pottery found in other parts of Egypt. But the strangest result awaited the explorers here. Not a quarter of a mile from this Egyptian town lay another site of a town. In that not one potsherd was like those of any of the periods seen in the Egyptian town. And, *vice versa*, not a single sherd like those in the strange town was to be found in Nubt. The two were "remoter than a star" in all their remains, and if the new town had been found in Syria or Persia no one would have supposed it to be connected with Egypt. Not only was a town found, but also a series of cemeteries of this same new race, and altogether nearly 2,000 graves have been completely excavated, every object noted in position, and everything preserved and marked. To accomplish so much in two or three months fully occupied five explorers. Professor Petrie had with him the Craven Fellow, Mr. Grenfell; the former Mexican explorer, Mr. Price; and an Aberdeen student, Mr. Duncan; while Mr. Quibell was working another part of the district on behalf of the new organisation of the Egyptian Research Account. The result of this thorough exploration was most strange and inexplicable. In this great number of graves not a single Egyptian object was found—not one scarab or cartouche, not one hieroglyph, not one piece of usual funereal furniture, a head-rest or a kohl-pot, not one Egyptian bead, not one god, not one amulet, not a single piece of Egyptian pottery, such as was found abundantly in the neighbouring Egyptian town. And not one body was mummified or buried at full length; all were contracted, with the knees bent up to the arms. The position was always with the head to the south and the face to the west. There were no traces that the bodies were embalmed. The tomb was an open trench with wooden beams, with the earth thrown in over the body, and corresponded in many respects with the graves found by Schliemann in Mycenæ. The extent of this race is shown by their characteristic objects having been found abundantly as far north as Abydos and as far south as Gebelen. This is a district of rather more than a hundred miles in length, opposite to the Great Oasis and the Western Oasis, which would give access to it across the desert from the west. The age of this people was the next problem, and, little by little, fact after fact limited their epoch, until we can definitely say that they were between the seventh and ninth dynasties, or about 3000 B.C.; and they probably were the people who overthrew Egyptian civilisation at the close of the old kingdom, and so produced that dark age of the seventh and eighth dynasties, when the Egyptians seem to have been narrowed and oppressed by disaster. The whole credit of this dating is due to the Egyptian Research Account, as Mr. Quibell fortunately had in his region a mixture of Egyptian tombs of the old kingdom and middle kingdom, along with those of the new race, and the inter-relations of these tombs solved the questions.

The ascertained facts about this new race may now be sketched. Their physiognomy was fine and powerful, without any trace of negro prognathism. Their stature was remarkable, some being over 6 feet high, and the great development of their legs points to their having been a hill race. The skulls were those of a race of people with well-developed heads, capable of great things, with thin hooked nose, high forehead, great

strength of eyebrows, straight teeth and without any trace of the negro about it. The women had long wavy hair of a brown colour, and of it some specimens in a fine state of preservation had been found. From a carved ivory found in one of the tombs they were able to tell that the men wore long pointed beards. The whole appearance corresponded to what Professor Sayce and others had recognised to belong to a Libyan-Amorite type. In the graves were found large numbers of red vases full of the ashes of wood, which had evidently been burned at the funerals. There was no trace, however, that the bodies themselves had been cremated. These ashes, Professor Flinders Petrie said, were evidently the remains of burnings, and he recalled how in the Old Testament it was mentioned that there were "great burnings" at the funerals of some of the Jewish kings, a custom which had evidently been borrowed from their Amorite neighbours. There were scratchings on these vases, but no hieroglyphics. Going on to discuss the date of the remains, Professor Flinders Petrie showed how they must be subsequent to the fourth dynasty. In the sloping passages to the Egyptian tombs of that period they found that graves of the new race had been dug. They must, therefore, come after that first great period of Egyptian civilisation. Above the graves of the new race, again, were found remains of the twelfth dynasty, so that they must place the date of the new race between the fourth and sixth and the eleventh and twelfth dynasties. It was likely that they were contemporaneous with the seventh, eighth and ninth dynasties, and were in all probability invaders—in some ways as civilised as the Egyptians themselves—who had swept into the country, had expelled the Egyptians from these parts, and with them had held no relations or commercial intercourse. They might put the date of this invasion at 3000 B.C. In going on to illustrate on the screen and to describe more minutely the "finds" made in the tombs, the Professor showed pictures of two rudely-carved female figures which, he said, resembled the megalithic figures found in Malta, and which were in his view not Phœnician, as was thought, but belonged to Libyan civilisation. A striking feature in the case of this race was that the head had been severed from the body previous to interment; and sometimes on the top of the vertebrae was placed a dish with the head again set upon that. In one grave where four or five bodies had been interred they found a row of stone vases with a skull and a vase alternating. Another peculiarity was that the bodies had been cut up before death, and the arm and the thigh bones had been broken and the marrow extracted—a strong evidence that if the race was not cannibal they practised ceremonial cannibalism, the custom being to eat some part of the body so that the virtues of the deceased might pass into the living. But we must not for a moment suppose that this implied an ignorance of all civilisation. In many lines—pottery, flint-working, bead-making—these people were the equals or superiors of the Egyptians.

Art and Civilisation.

The arts were well advanced in most ways. But in two directions there was a remarkably low level; no writing was known beyond personal marks, no trace of hieroglyphs is met with, and drawing and sculpture were in a very rude condition. Metal, however, was well known; copper chisels, or rather adzes, show that woodwork was familiar, and traces of finely-carved bed frames with bull's feet were found; copper needles also showed that sewn garments were used; and copper harpoons were imitated from the form in bone. Flint-work was far more highly developed than by the Egyptians; the forms of the knives differ from any of the Egyptian race, and the exquisite machine-like flaking of them shows the highest skill. We now know that the finest examples known—in the Ashmolean and Pitt-Rivers Museums at Oxford—belong to this people. Stone-working was also a favourite art, many beautifully formed vases of all varieties of stone having been found, from the soft alabaster to the hardest syenite. All of these are entirely wrought by hand without any lathe or turning process. Figures of animals and other forms of slates are commonly found, and were used to grind malachite upon by means of brown jasper pebbles. This colour was probably used for painting the eyes, as among the earliest Egyptians. Beads were skilfully made of hard stones, and many were glazed, but the forms were always un-Egyptian. The clear crystal beads with a coloured glazing are now known to belong to this race. In pottery these people excelled. The exquisite colouring of the red vases, showing every shade of crimson, with brilliant black tops, produced by being burnt in the ashes, is more rich than in any Egyptian ware. The forms are varied and often fanciful, but generally graceful and true. And yet every piece was made entirely by hand; the potter's wheel was completely unknown. This shows how great a break had been made from the old arts of the country; for if any of the men of the old kingdom had been retained, even as slaves, the wheel could not have failed to be used among a people so devoted to pottery. Few tombs contained less than half a dozen vases; many had twenty or

thirty, and one even eighty. Some of the pottery was coloured a rich crimson red, which was produced by a hematite glaze; some of the vases had a black band round the lip. Other pieces had a buff body colour with red painted lines. Among the forms the double vase appeared; others were in the form of birds; some of the larger pieces had handles akin to those found on the Amorite pottery of Palestine, and there were ornamental slates upon which, with a burnishing pebble, the people ground malachite to make green paint. This they used for the eyebrows instead of the black paint of the Egyptians. On one of the large vases was a rude representation of a boat, with cabins and oars, from which it was implied that this race knew something of the sea, though this vase, with some others of polished black ware, akin to the black ware of Italy, was evidently not home-made but imported. About 100 stone vases had, in all, been found in different material, all hand-made, and, like the pottery, of graceful form. Their flint implements, it was also pointed out, were of great beauty and delicacy, and copper and bone adzes and harpoons and ivory pendants had been found. The race knew and venerated the dog, for in one of the cemeteries a grave in which seventeen dogs had been buried was found. Summing up, Professor Flinders Petrie said the race evidently did not come from the south, as they had no affinity with the negro, and there was a strong presumption that they did not come from the north into Egypt; for from the fourth dynasty there had been continuous civilisation at Memphis, the capital of the country. They must, therefore, have come from the east or west. The probability was that they came from the west, as the district they occupied was opposite the western oasis, from which any invading race would naturally march eastward. Seeing that the remains had much in common with that of the Amorites in Syria, his hypothesis was that both were of the Libyan race inhabiting the north of Africa, who, about the period of the close of the sixth dynasty, threw off two great branches, one of which found its way into Syria, and the other marching westward subdued this portion of Egypt of which he had been speaking, had destroyed the inhabitants, but had been unable to make their way further north on account of the determined front presented to them from Memphis. But the remains of both the people and their works must be thoroughly studied, and further research made for other settlements of theirs, before positive conclusions can be drawn. Here, at least, we have an entirely new and unsuspected factor in the most important civilisation of the ancient world.

THE SILCHESTER EXCAVATIONS.

THE labours which were undertaken by the Society of Antiquaries at Silchester, and which have now been carried on for five years by Messrs. St. John Hope, Fox, Jones and Stephenson, have during the past season been fruitful of valuable and unexpected results, and it may fairly be said are amassing for us materials for the reconstruction of the history of Great Britain during the Roman occupation. The various objects found and the plans and drawings of the city now in process of reconstruction may be seen at the rooms of the Society of Antiquaries, Burlington House. In previous years the forum and basilica, an ancient temple and what is believed to be a Christian church, an inn, baths, houses of different classes of society, and many interesting artistic remains rewarded the explorers. The plan of the city and the lie of its streets were traced with considerable exactness of detail, and the distribution of the inhabitants and the degree of civilisation and comfort which they had attained could be conjectured from the remains. Last year's excavations, which were begun on April 30 and continued, with an inevitable break for harvesting, until October 18, involved the thorough examination of six and a half acres, including the southern half of Insula IX., the two Insulae X. and XI., and a triangular Insula XII. lying to the north of Insula X., against the city wall. In the four Insulae excavated, with the exception of the irregularly placed house of the corridor type, and possibly of a second south of it, which were referred to in last year's report, only one other house has come to light, which lies on the southern edge of Insula IX. and abuts on the main street of the city. The only important architectural remains are a medium-sized capital and base of a Doric column of good character, which had, in a spirit of vandalism, been used for building material, and a large and fine slab of Purbeck marble. Other objects were, of course, unearthed in metal, bone, glass and iron, including a gold ring of good design and a fine piece of pierced bronze-work, and a number smaller than usual of fragments and whole pieces of pottery, especially of the coarser kinds. Every year brings its small contribution of coins, but last season far outstripped the others, and a hoard was disclosed hidden in a black earthenware vessel in Insula IX., consisting of 253 silver denarii of various dates, from Mark Anthony to Septimius Severus—a range of about 250 years—

and almost every reign was represented by one or more coins. Of these, 48 were retained as treasure trove by the British Museum, and the remainder are to be deposited at the Reading Museum with the other finds from the ancient city. The latest date on any of the coins is one of the earlier years of Severus (193-211 A.D.), from which the approximate date of secession may be conjectured.

But the most important discovery, to which it is believed that archaeological research affords no parallel in these islands, is that of a number of furnaces, obviously of an industrial character and of various sizes, some of them being circular and others oblong. They were found partly within and partly without a series of rectangular enclosures or buildings. Twelve of these buildings have been uncovered, all of the same type, and twenty-one hearths, twelve circular and nine oblong. It is believed that these buildings and their adjuncts were devoted to the dyeing industry, and this conjecture is made probable by the large number of wells discovered, one of which was of peculiar and unusual construction. A plan is exhibited of one of these circular furnaces, and it is found to correspond exactly with a dyeing furnace at Pompeii, of which the sections are shown on the wall. The circular furnace was, there is every reason to believe, used for dyeing. But there are a number of others with a straight flue, which are supposed to have been intended for drying. At Pompeii the climate made drying-rooms unnecessary, and nothing has been found there corresponding with the straight-flued furnaces. There are also traceable a number of rooms which, it is presumed, were intended for the storage of goods and materials, and open spaces with no remains of flues which may have been used for bleaching grounds. It is thought that these furnaces belong to the later period of the city, and the traces of successive occupation lead to the conjecture that the richer inhabitants left the district in which this industry was carried on and migrated eastwards. The theory is strengthened by the discovery *in situ* of a number of querns for hand-grinding the madder roots used for dyeing purposes.

It need hardly be added that an earnest request is made by the committee for funds. The annual expenditure is between 400*l.* and 450*l.*, of which wages absorb about 300*l.* and the rent of the land 35*l.*, whereas the subscriptions scarcely exceed 300*l.*, and the fund is in debt to its treasurer, Mr. F. G. Hilton Price. In the coming year two more Insulæ—XIII. and XIV., adjoining the west gate, south of the main street—will be attacked, as they are known to contain interesting remains, and it is also hoped that Insulæ V. and VI., underlying the pasture east of the forum, may be taken in hand. Altogether, about forty out of the hundred acres within the walls have been excavated, and the committee anticipate that, at the present rate of progress, several more years' work will have to be done before all the treasures and knowledge buried in the soil have been revealed. It is to be hoped that the claims of our own country may not be forgotten in the enthusiasm about the perhaps more brilliant, but not more instructive or valuable, discoveries in Egypt or the Levant.

Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

BEGINNING PRACTICE IN THE THIRTIES.

THE difficulties which await young architects at the beginning of their professional careers are not the creations of our time. A paper which appeared in 1834 reveals that when there were few competitors for practice it was no less difficult to secure clients. The style of the writer may be old-fashioned, but what he says was evidently derived from experience:—

To what base uses we may return!

The sketches of a travelling architect are far more likely to exhibit the poetry of his art than those of an architect in practice; at least in these days of penny wisdom, when a man had rather forfeit all the acknowledged rules of proportion between solid and void than pay the tax upon a sufficiency of windows of sufficient size. Only consider for a moment the early career of a young architect of aspiring mind and lively imagination. He has hitherto been employed first as an office student and afterwards in the pleasing occupation of a tour through all the brighter scenes of classic celebrity. Having studied at home the volumes of Palladio, Wilkins's "Magna Græcia," Stuart's "Athens" and Denon's "Egypt," he hurries away on wings of eager expectancy, tangibly to enjoy communion with those revered objects whose essentials of beauty and proportion have been already made known to him through the media of description, and the graver Italy opens to him her rich treasure

of miscellaneous art; Sicily points proudly to Agrigentum; he weeps at the sight of the Athenian Acropolis, and, on entering the sepulchral cell of Theseus, exclaims,

If it were now to die
'Twere now to be most happy!

forgetting at the moment that he has yet to wander with the Nile amid the astounding ruins of mighty Thebes. He now contemplates the massive splendours of Latopolis and Tentyra; swells with honest pride at the evidences of man's intelligent power as afforded by the Propylea of Edfow, Luxor, and Philæ, teems with a still increasing spirit of emulation, and paraphrases the vengeful proclamation of Lear:—

Aye, ye proud monuments,
I will afford such rivals to you all,
That all the world shall—I will do such things—
What they are, yet I know not; but they *shall* be
The wonders of the earth.

He returns home—to the scene of his future practice, or, at least, of his future hopes. Not so unreasonable as to expect immediate employment, he is content for a time to "build castles in the air;" that is, to suspend his professional imaginings in the atmosphere of the exhibition at the Royal Academy. It is true his designs for "royal palaces," "triumphal entrances," "national mausoleums" and "senate houses" (if admitted into the exhibition-room) gain him but little credit; and it is, perhaps, with some degree of chagrin that he sees the great mass of the spectators pass over his 40 square feet of pictured paper as they would over the variegated surface of a Turkey carpet; but still, people may not understand drawings, they have yet to see his designs in palpable material, shadowed and coloured by nature. Then shall they rightly judge, and in this consideration he forgives that present want of sagacity which regards as insipid the architectural room, and pounces with "lynx-eyed" fervour upon the cabinet of miniatures. Besides, his productions are addressed to the intelligent few, whose report will in reasonable time have a due effect upon the many, and bring him honour and employment. With this "few" it is not his good fortune to meet, though pretty constant in his attendance, hoping personally to experience the sweets of unprejudiced approval. Still, he cannot be always there, and it is therefore a freak of fortune that all the good things uttered of him are spoken behind his back. This, according to Shakespeare, only makes them "of more price." His talents are, no doubt, appreciated, while his modesty remains free from offence. This is delightful. When professional power and philosophical acumen are thus united happy indeed is the mind in which they conjointly act.

My hero is now established in an office. The brass-plate on his door announces his vocation, and name, street and number being advertised in the Academy catalogue, he hourly expects a call from some fascinated man of judgment, who may safely conclude that the author of a "royal palace," "triumphal entrance," "national mausoleum" and "senate house" must needs be more than competent to the erection of a country mansion or chapel-of-ease. Thus, as you will perceive, gentle reader, he is not unreasonable in his expectations as a young practitioner. He knows that commissions of hundred thousand pounds value are not "plentiful as blackberries," but that gentlemen are constantly building mansions, and that chapels-of-ease are in unprecedented request. He therefore prepares a series of sample designs, including all the varieties of the horizontal Greek and perpendicular Gothic. Doric porticoes, Ionic vestibules and Corinthian drawing-rooms are placed in striking contrast with Saxon porches, florid altar-pieces and crocketed spires; plans, sections and elevations strew his side-table, and the riches of his travel glow resplendently from his walls. Hush—a step—knock, knock. The twopenny postman. A letter from—his mother. "My dear Son,—Your father and I have just seen our friend, Mr. Fullmoney. We told him of your progress as a student and of your promptitude for practice. He has not yet seen your drawings in the exhibition, but he expresses a desire to see you, as he thinks of giving you a job. We have heard of his intention to build, and the supposition that he will do so is most reasonable, since he has lately given fifty thousand pounds for a fine estate on which there is nothing but a shabby old farmhouse, and we know his intention to reside on the property. Lose no time in calling upon him. Show him your drawings and your journal, and talk to him about all those wonderful things which may give him pleasure, but which are somewhat above the comprehension of your poor dear father and your ever affectionate mother,

SARAH SONPROUD."

To be sure 'tis not pleasant for a man who has traversed Italy, ascended the Acropolis, and marched in state among the wonders of Nubia, to sit waiting half an hour in the cold, on the polished oak bottom of an old citizen's hall chair. The powdered footman might have asked him to walk into some unoccupied parlour, with a fire and newspaper to prevent shivers and tedium. However, he'll catch it when his master knows whom he has abandoned to the exclusive contemplation

of hat-pegs and oil-cloth. Yet he sent in his name—a name well known to the proud cit. By the marbles of Pentelicus, but this is wondrous strange.

He is at length summoned into the library, when old Fullmoney throws balm on his hurt mind by hoping he has “not waited long,” by fearing he must have “found it cold,” and by telling him finally he is “happy to see him.”

“Well, sir, your parents speak wonders of you. You have recently returned from your travels? and which do you like best, England or France?”

“Why really, sir, I know little of France, the mere entrance-lodge to the vast domain of continental art. Besides, sir, it was not my part to cultivate any partiality for soil or climate, people or their laws and customs. My sole motive, sir, was the attainment of professional erudition, and in Italy —”

“Oh, you’ve been to [stirring the fire] Italy, have ye?”

“Yes, sir, and thence through Sicily and Greece.”

“Greece, too, have ye?” [Ringing the bell.]

“Yes, sir, and thence to Egypt.”

“John, more coals.—To where, sir?”

“Egypt, sir.”

“Indeed. Did ye see any crocodiles?”

“Why, sir, they are frequently to be seen, but I was so taken up with inspecting the numerous temples.”

“Aye, in search of mummies, I suppose. Curious mummies those at Bullock’s Museum, eh? What have you there?”

“A few of my drawings, sir, made upon the spot, and laid down to actual measurement. This, sir, exhibits a restored elevation of the portico of the Parthenon.”

“Aye, just like the front of the India House. Very pretty. What’s this?”

“The Pantheon, sir.”

“It looks to me like the Coliseum, as they call it, in the Regent’s Park—very pretty. What’s this?”

“The Lantern of Demosthenes.”

“A lantern, eh? It’s like a spice-box. Where did they put the candles? Very pretty. What this—a turnpike lodge?”

“No, sir; the Temple of the Winds.”

“Indeed! well, it does somewhat resemble a chimney-pot. What’s that, standing all alone there in the fields?”

“The Temple of Theseus.”

“’Twould make a pretty cowshed. Well, sir, I must look at the remainder another day; and now to business.”

The feelings of the young architect during the foregoing colloquy can be fully understood by those few alone who professionally, or as amateurs, have studied ornamental architecture in its details. They who entertain any feeling for the art in a general sense would, of course, be sufficiently disgusted; but to the young professor, who reveres the smallest moulding in the least important example of antiquity, such a laceration of forms adored must prove no less than ghastly. However, the prospect of a job aids the endurance of the offence; and there is further comfort in considering that the new country mansion will address itself, not merely to the eyes of the ignorant Fullmoney, but to the informed beholding of his visitors and the passing stranger. What a portico will he have! What a vestibule and staircase! How choice and appropriate shall be the decorations! How massive and firm the construction!

The patron thus develops his purpose to the expectant professor:—“Now, sir, you have possibly heard of my having lately purchased an estate near ——. The park is most beautiful, rich in noble timber and commanding in situation. Everything in short is admirable except the house, which is indeed a mere remnant of the old mansion, and has been for some years back occupied by a farmer. Here is a plan of it, taken by my carpenter. You see, sir, how extremely inconvenient it is in almost every respect. The dining-room too small; the other a passage-room. Then, sir, it’s very much out of repair. There’s no closet of one particular sort (you understand me, sir) and too many of the other sort. In short, sir, after considering the matter over and over again, and taking the advice of a friend, I have come to the determination of ——. What d’ye want, John? Excuse me, sir, for a moment while I exchange a few words with my solicitor.”

During the patron’s absence our young professor fills up in his imagination that blank in the conclusion of Fullmoney’s address occasioned by the footman’s message. “Yes, sir,” thinks he to himself, “you have come to the determination of pulling it all down, and of building a new mansion, suited to the beautiful park you have so justly extolled. You have come to the determination of mistrusting your own judgment on matters of taste and of trusting to me for the provision of a good and handsome residence, with all the appendages and superior conveniences, the character and beauty, that should distinguish the man of fortune, and preside among a park of oaks. You have come to the determination of —”

At this moment re-enters the patron:—

“Well, sir, as I was saying, I have come to the determination of putting the whole in habitable repair, and of making one or two little alterations, which will, in effect, prove to be very great improvements. Now, sir, these are my ideas on the subject. First, knock down the end of that useless closet, so as to make a way from the dining-room to the kitchen without going through the drawing-room. Secondly, knock a hole through the stone wall at the end of the dining-room, and put a thin partition flush with the outer face, by which we may get a recess for my sideboard, and thus virtually enlarge the apartment. Thirdly, poke a little window into the outer wall of this closet upstairs, and fit it up as the required convenience to which I have before alluded. Fourthly, put the entire house into repair and give the old work two coats, and the new work four coats of common oil paint.”

Spirits of Memnon, Ictinus and Phæax, shades of Vitruvius, Buonarrotti and Wykeham, hover around me in merciful protection, or rather give me the benefit of your wings and bear me up and away, where even

the birds dare not build,

Nor insect’s wing flit o’er the herbless granite.

Are we then after a course of mighty preparation for emulating the gigantic splendours of ancient art; are we then (fraught with a swelling ambition which o’erflows our continent of modesty); are we, most placid Lady Patience, to be subject to the climax of being smothered in the destruction of a lath and plaster partition? or employed partly to amend, but chiefly to perpetuate the clumsy blunders of an ignorant country carpenter? “Base,” indeed.

II.

AUSTRIA. — I must pocket up these wrongs,

Because —

BASTARD. Your breeches best may carry them. — KING JOHN.

Yes, though loss of patience may be sufficiently troublesome, still more so, as John says (not Plantagenet, but Gilpin), would be the “loss of pence;” and, therefore, full money must be borne with. I should, perhaps, have concluded my last by saying that the old gentleman dismissed me with a most gracious promise that he would “drive me out some day in his gig” to see his estate, and to confer upon the spot touching the important alterations he had in contemplation.

“And,” said a quiet worldly experienced friend of mine, “you really must come down from your high imaginative flights, and consent to labour for a time in the trenches of your fortune’s edifice, remembering that there is often a close analogy between the progress of moral and of physical things. Thus, to address your professional understanding, I might render some useful directions for the establishment of an architectural practice, by a parody on the specification you would afford for the proper erection of a patron’s house.”

Digger, &c.

To dig out and wheel away all loose notions of self importance down to the solid of your understanding, and to blast (not by profane but by legitimate explosion) whatever rocks of prejudice may rise against you in the mind of your would-be employers. Excavate for and form drains to carry off the superfluities of your youthful imagination, and leave ample space for the footings of your existence on the basis of public opinion.

Mason.

Foundations of your substructure to be formed of plain sound evidences from the quarry of practical knowledge, firmly bedded in the advice of more experienced information, and grouted every third course with a sufficiency of penetrating supervision. Carry up the walls of your superstructure to such an altitude as the solidity of your basement will allow, so that no settlements in the former shall betray the insufficiency of the latter. Wherever the strength of solidity is to be interfered with by the open work of fancy, turn inverted arches of provisional and precautionary care. Construct all flues round the circular cores of upward purpose, so that any occasional fire in your patron’s temper may be carried off in smoke. The whole of the masonry to be laid in mortar well compounded of one-third good intentions and two-thirds executive power. The outside face of all walls to be cemented with a pervading expression of cheerfulness, which if all preceding directions be observed, will not belie the facts concealed.

Carpenter and Joiner.

Roof to be framed with king and queen posts; staunch principles (principal rafters), and a binding beam, that may serve at once to render firm the body of the building, while it forms a part of its protective covering. The whole to be strongly bolted together with well-tempered determinations, so that the slating which is to cover the whole may be adequately supported in its opposition to the winds and the rains of fortune’s tempests. Partitions of sufficient scantling to show the existence and distinct importance of

the numerous departments of architectural science. Floors of competent strength to bear the pressure of your knowledge in each department. Decorative joinery and necessary fittings as may be admissible or requisite throughout the building, to evince your coexistent feeling for the elegant and the useful, with a due supply of locks, bolts and bars, to prevent the inroads of dishonesty or impertinent curiosity.

Plumber, Painter and Glazier.

Provide and fix all required pipes of a sufficient bore to prevent the stagnation or settlement of "fortune's rain" as aforesaid, and turn as much of it as possible into a benefit, by collecting the same into a well-lined cistern, whence it may be again transferred into various departments of home service. Paint the whole of your joinery, &c., in true and honest colours, and varnish the same with a view to poetical fascination—not immoral deceit. Glaze the whole of your lights with the best crown glass, so that your loyalty may remain unobstructed, your domestic comfort preserved and your professional prospects undimmed.

Slater.

Cover the whole of the roofs with sound lady slates, nailed on good heart laths, and, secure in its strength, enter into the mansion which your integrity has built for you.

Thus ended my friend's "specification and particulars of sundry works to be done in the erection and completion of an architect's professional fame;" and as he gave it to me, then an incipient, so do I bequeath it to others, with a ready allowance as to the ease of drawing up a code of good advice and the difficulty of following up the contract. How came Portia to be so architectural in her moralisings? "If to——"

But the glorious Shakespeare suits every argument with fitting illustrations; nor could architecture be better employed than in designing such an edifice as in its erection would show how deep was our love for his moral excellence and how lofty our admiration for his transcendent powers as a creator of airy beings and as a painter of mortal life. Mercy upon us, what an antipodean transition! From Old Fullmoney to William Shakespeare! Let me look back at my text:—

AUSTRIA. "—— I must pocket up these wrongs,
Because ——"

BASTARD. "—— Your breeches best may carry them."
—KING JOHN.

And the young aspirant to architectural practice, who is also obliged by circumstances to look after the garniture of his pocket, will meet with "wrong" enough to inflame his pride. Not, however, that any wanton wrongs will, of course, afflict him—though, indeed, it were well he should be prepared even for these—for the architect comes into more decided collision with the vulgar many (I do not speak of the poorer and more uneducated classes) than any other follower of the fine arts. It argues not any invidious and vituperative spirit in individuals to say that he is to be bullied by committees, ridiculed by the press, and censured even by men of taste. The first will destroy the original simplicity of his plans, the second will laugh at him for not maintaining it, and the third (ignorant of all preventive and compulsory circumstances) will find him guilty of professional error wherever he has been goaded into sorrowing obedience. The history of Sir Christopher Wren is a sufficient evidence to all this. Few of us, however, can suffer wrongs so perplexing as his, for few can pretend to talents so meriting universal admiration, to disinterested zeal so deserving of reward, to moral worth so eloquent in appeals to our love. See his life as detailed in the "Library of Useful Knowledge," that you may the more immediately estimate the caution, "put not your trust in princes."

Again, I must declare against any accusation of bitterness on my part or of wanton unkindness on the part of patronage. It is merely a duty to warn the heedless aspirant of those "man-traps and spring-guns" which Queen Mab and mischievous Puck have set in the "premises" of architectural practice. The times may come when he will have less to fear, when sympathy shall be pervading and good taste general; but if human nature be "not critical" she is "nothing." Let each man in his individual calling do his best to enlighten the public so as to render it critically just in its feelings and expressions; but let him also during the work of reformation quietly "pocket those wrongs which his breeches best may carry."

The Class for Architectural Modelling at the Royal Academy Architectural School has terminated for the session, and a series of eight demonstrations will be given by Mr. Stannus each Thursday evening, from six to eight, commencing May 2, on sub-panelling and ceiling-design.

ARCHITECTURE IN COLOMBIA.

IN no place in the world has Spain so elaborately lavished its knowledge of architecture, writes Mr. Caracristie in *Stone*, as it did in Colombia in colonial days, before the great Bolivar unyoked the people from the plough of tyranny. But however great may have been their adornments of churches and convents they have never reached the height of architectural perfection to which the Chibchas nation rose in the early part of the Christian era. Those Indians who occupied the savannah of Bogota, a great tableland, nearly sixty miles long and fourteen wide, rose to the greatest height of civilisation—a civilisation perhaps higher than that of the Incas of Peru and the Aztecs of Mexico. So wonderful and complete was their temple, so vast in extent were the buildings by which it was surrounded, that when the Spanish conquerors arrived and beheld it they were dazed with stupefaction. The spirit of vandalism of Spain was never so fully manifested as when the ignominious torch touched the altar of this edifice. The fire that followed is said to have lasted three months, and in the words of an Indian of this country, "the roar of the tiger ceased not during this period and the condors slept not; neither did the sun shine upon the lands of the Chibchas; for their god was about and swore the downfall of Spain." The spoils from this edifice, in gold alone, amounted to a heap so high that two horsemen riding around it could not see each other.

The very soil on which I am writing this moment was the site of this temple, and the cathedral of Santa Fe, which is just before me, is partly built of its ruins. Bogota has many historical associations, and while we might go from New York to China in a shorter time than it takes to come to Bogota, yet in the early days of the conquerors Colombia took a great part in the theatre of wars which swept South America from ocean to ocean; and it has to-day the spirit of progressive enlightenment which shall make it one of the great nations of our western hemisphere.

The great facility and ease with which stone may be quarried in the neighbourhood would make its use very cheap were it not for the want of roads and transportation; yet many houses are built of a light buff sandstone which is easily worked, durable and cheap. In fact the whole of Colombia abounds in beautiful buildings and ornamental stones, especially marbles of the finest kind; but these latter have not yet been worked, although a company has lately been organised in Bogota to work some deposits which are said to exist near the city, and which I shall examine in a few days.

This abundance of building stone to which I refer has made it possible for the Spaniards to build beautiful churches which have withstood the power of the elements and time.

The greatest piece of stonework on the American continent is the "great wall" of Cartagena which surrounds the whole city, and is so wide that twelve men can ride side by side on it. These walls, constructed of a porous limestone resembling coral, were built by the celebrated engineer Arebalo at a cost of 56,000,000 dols. The labourers employed were Indians, who were so ill-treated that often when caught in their native fastnesses and brought to Cartagena they killed themselves rather than submit to the harshness of slavery. About a mile from these walls was built one of the prettiest forts in the world at a cost of 10,000,000 dols. This was known as "San Felipe," and nothing remains of this building but a picturesque heap of ruins. Between this fort and the cathedral of Cartagena is a subterranean passage which goes under the sea a distance of three-quarters of a mile. This is now so filled with bats, snakes and debris that I found it impossible to descend into it to any distance.

Among the beautiful structures of South America may be named the church of San Juan de Dios, in Cartagena.

The buildings of Barranquilla are more modern and offer nothing for the student of architecture, while the cathedral of the city of "La Cienaga" is very picturesque and ancient. Strange as it may seem it is the only building in the city which one would care to look at.

Santa Marta, the ancient rival of Cartagena, but now only noted for the splendid varieties of bananas which are produced in the surrounding country, also offers much valuable material for the student of ancient architecture.

Medelline and the other cities of interior Colombia offer but very little of interest, while Panama has among its ruins some beautiful pieces of work.

Bogota is a beautiful city, and while it lies amidst the luxurious splendour of equatorial America, its altitude above the sea-level (8,500 feet) gives it a climate of perpetual spring. Among its wonderful structures may be mentioned "La Capilla del Lagrario," which contains an altar 35 feet high by 20 feet wide at its base, all of which is built of polished turtle-shell and inlaid with mother of pearl. This building is finished in the interior with ebony, mahogany, rosewood and other woods equally as rare and beautiful. The ceiling is gilded and carved, and presents an appearance of richness seldom seen in any

other part of the world. The cathedral, too, is a wonderful stone structure with the interior richly adorned with the most wonderful works of modern and ancient times. A Virgin that is found in this edifice has besides gold, rubies and emeralds, &c., over 700 rare and pure diamonds. Its value is unknown and it is in itself one of the most wonderful works of the world.

The great San Franciscan convent, Bogota, too, is one of the wonders of South America. The altar which is found in it is a work of magnificent art and is truly worthy of special note.

In the town of Monqui is a beautiful church and convent built by the Spaniards, which contains a celebrated picture of the Virgin of the Rosario painted by the Emperor Charles V.

From an architectural point we have much to learn from the ancients, and a collection of Colombian buildings would do honour to any of our cities of the United States.

PERSIAN TILES.

A **SPLENDID** Persian section has been steadily growing in the Edinburgh Museum of Science and Art under the fostering care of General Sir Murdoch Smith, whose long connection with this interesting Oriental country is, says the *Scotsman*, a guarantee for the excellence of the exhibits from it which find their way into the museum. It is of especial importance to all interested in decoration, whether in connection with the art of the jeweller and silversmith, the potter, the maker of carpets and curtains, or the decorative printing of paper or textile fabrics. One group of exhibits in this new section consists of examples of the old lustre ware of Persia dating from the eleventh century, later work about the sixteenth century, and of present-day pottery in the shape of decorative tiles of various descriptions and for different purposes. The craftsman whose name is attached to this last-mentioned group is that of Ali Mahomed, a potter who was known to General Sir Murdoch Smith in Ispahan, but who is now located in the capital, Teheran. They are not equal in beauty to the older work, but they are exceedingly good, and show that the feeling for art is by no means extinct among the craftsmen of Persia. Half a dozen large tiles for the sides of a fireplace have just been placed on exhibition, and it is to refer to them more particularly that this paragraph is written. In the end of last year a gentleman interested in all artistic matters in the city was in the museum with the director, and was greatly struck with the excellence of the modern Persian tiles. He inquired about the artist, and was informed that he was a craftsman of Teheran. "Could such tiles still be had?" "Yes," the director thought, "they could if Ali Mahomed was still alive." It appeared on inquiry that this craftsman was still at work in the capital of Persia, and an order was placed with him for tiles to line the sides of a fireplace. Only the sizes were given; all the rest was left to the artist. The tiles reached Edinburgh the other day intact—a marvellous thing in its way, when it is stated that they had to be brought from Teheran 800 miles on the back of mules over the most wretched mountain roads to Bushire on the Persian Gulf, where they were shipped. The designs represent *al fresco* scenes, and the colours approximate to those of the old tiles, the rich blue of the country being the basis, with greens and yellows in various tints for the details. In one there is a festive scene which might be taken from the "Decameron;" in others there are representations of the chase. The figures worked in relief are daintily and spiritedly drawn, and a fine decorative spirit pervades the whole treatment of the designs. The prices at which these tiles can be obtained seem most moderate, and suggest an excellent field for an enterprising syndicate opening a trade direct between Edinburgh and Teheran. The tiles which have just been described will be removed in a few weeks to adorn the fireplace of a billiard-room in a country mansion in the north of Scotland.

SCHOOL BUILDINGS.

Edinburgh.—A new Board school has been opened at Brunsfield. The entire building is heated by steam pipes, and is ventilated by mechanical means. A Blackman air-propeller, driven by a steam-engine, extracts the vitiated air from the various classrooms. The school, designed by Mr. Robert Wilson, the Board's architect, is in style an adaptation of French Renaissance. The front elevation, about 158 feet in length, is relieved at each end by two projecting gables. In the upper part of these gables are semicircular panels, on which are carved the Scottish arms and the city arms. In the lower part of these gables are pieces of sculpture, the one representing elementary education and the other technical education. From the centre of the roof there rises an ornamental *flèche*, in which is hung the large bell. The total cost of the school buildings is expected to be 27,300*l.*, which is not considered excessive considering the size of the school and the

complete way in which it has been equipped. The contractors for the different works were Messrs. Kinnear, Moodie & Co., and the heating and ventilation have been carried out by Messrs. Mackenzie & Moncur.

Uldale.—A new National school has just been opened. It is built of red freestone dressings from Aspatria quarries, mixed with a lighter-coloured sandstone from a local quarry, the effect of the blending of the two shades of colour being lightsome and pleasing to the eye. The main schoolroom is 37 feet by 20 feet, and provides accommodation for eighty scholars, mixed—a good many more, it is said, than there are at present in the parish. All the windows are fitted with Leggott's patent fasteners. The floor is of wooden blocks, the walls inside are cemented, and the ventilation is on the Boyle's Climax system. The building is slated with the best Buttermere slates with red Staffordshire ridges. There is ample playground to the rear of the school, the boys and girls' playground being separated by a wall about 6 feet high. The contractor for the whole of the work was Mr. J. H. Routledge, Mealsgate. Mr. A. W. Johnston, English Street, Carlisle, was the architect.

NEW BUILDING.

Balmoral Hotel, Edinburgh.—Extensive additions and alterations have recently been made at this building, consisting of a very fine new dining-room, 55 by 53 feet, assembly or dining-room, 58 by 27 feet, writing-room, thirty visitors' and ten servants' bedrooms, lavatories, remodelled kitchen and serving rooms, new American "Otis" elevator, remodelled bar and restaurant, &c. The work has cost over 9,000*l.*, and has been carried out by Mr. J. Macintyre Henry, architect, Edinburgh.

CHURCH BUILDING AND RESTORATION.

Arbroath.—The memorial-stone of the restored parish church of Arbroath has been laid. The old church was accidentally burned down in November, 1892, and is now being restored from plans by Mr. J. J. Burnet, A.R.S.A., Glasgow.

Morecambe.—The foundation-stone of a new Roman Catholic church has just been laid. The church has been designed by Messrs. Pugin & Pugin, of Westminster, and will consist of a chancel, nave and an aisle on the left side. Accommodation will be provided for between 200 and 300 persons, at an estimated cost of 3,000*l.* The contractor is Mr. Charles Walker, of Preston.

GENERAL.

Mr. Henry Moore's picture, *Hove-to for a Pilot*, has been voted the best seascape in the exhibition of the Glasgow Institute of Fine Arts.

Mr. J. W. B. Rooke, C.E., has been appointed surveyor to the Swaffham Rural District Council out of forty-two applicants.

The **Committee** of the Church Building Society have sanctioned the appointment of Mr. R. Norman Shaw, R.A., as president of the committee of honorary consulting architects, in the place of Mr. Ewan Christian, deceased, and two vacancies on that committee are to be filled up by Mr. T. Graham Jackson, A.R.A., and Mr. C. H. M. Mileham.

The **Annual General Meeting** of the members of the Art Union of London was held on Tuesday. The first prize was won by Mr. R. J. Fentiman, and one of 50*l.* by Mr. H. E. Johnson. Forty additional prizes were awarded, one a bronze statuette of *The Warrior*, and the others ranging in money value from 10*l.* to 35*l.* South Australia, New Zealand, Canada, Germany and New South Wales were all represented in the prize list.

The **Ordinary Meetings** of the Institution of Civil Engineers during the present session will not be held, owing to rebuilding of the premises. For the special meeting on May 2 and the annual general meeting on May 28, the Royal United Service Institution will be used.

Mr. Charles Dyall, curator of the Walker Art Gallery, Liverpool, has issued his report to the arts committee on a visit of the deputation to the London studios. He says the deputation found much that was gratifying, especially the cordiality of their welcome and the ready response to their invitations. They also found that the reputation of the Liverpool exhibition was in no way diminished, but that the Walker Art Gallery was regarded as an important factor in the art interests of the country.

The Architect.

THE WEEK.

THE decision which was given by Mr. Justice DAY and Mr. Justice WRIGHT on Wednesday in the appeal case *LAVY & UPJOHN v. London County Council*, is important. The appellants are the owners of one of those houses in the City Road which still have forecourts; in their case it was about 38 feet in depth. It was separated from the roadway by a low brick wall and iron railing. The owners endeavoured to obtain permission to build upon their forecourt, but the County Council refused. A hoarding was then erected for advertisements, but on the demand of the Council it had to be removed. The low wall, which was not more than 2 feet or 3 feet in height, was replaced by another 11 feet high. It was considered as an erection beyond the general line of buildings in the street, and which required the consent of the Council. After a summons was taken out the superintending architect decided that the line of building corresponded with the front of the house. When the owners, after adjournments, came before the magistrate, he ordered the demolition of the new wall as a structure in front of the general building line which was erected in spite of the County Council. It was contended that the magisterial judgment was irregular, as there was no decision of the architect to go upon. The appeal was, however, dismissed. It was considered that as before the case was heard by the magistrate the architect's decision was approved by the appellate tribunal, it was a final decision. But that point in the opinion of their lordships was immaterial. As to the contention that the wall was not a structure, their lordships held that it must be a building, structure or erection, and the appeal was accordingly dismissed.

THE consequences of the failure of the Bouzey embankment are so calamitous, they should arouse water companies and municipal authorities who have charge of water-supplies from that excessive confidence in the superiority of English construction which may lead to danger. A special examination of every large impounding reservoir should at once be made by an independent specialist. We have unfortunately evidence enough that we do not enjoy an immunity from danger. The bursting of the Dale Dyke reservoir, by which about three hundred lives were lost, should be enough to convince responsible parties without further corroboration. When dams are torn asunder, or are made to slide, the district must be desolate in which the loss of life is not appalling. The failure of the reservoir at Johnstown, in the United States, was the cause of the sacrifice of 9,000 lives. In a district that would be closely populated the loss would be greater. The dam at Bouzey, which collapsed on Saturday morning, was not an old work, for it was not finished until 1884. It was strengthened in 1888-89. Unlike some English examples, it was a masonry dam. The foundations were sunk to about 30 feet below the bottom of the reservoir, and rested on firm rock. There were, it is said, no indications of its weakness—at least since 1890. But it is not unlikely that the additions for strengthening the dam did not form a homogeneous mass, and a very slight opening to admit water sooner or later will bring ruin. While the French sufferers merit the sympathy of the world, their fate should compel people in other countries to ascertain whether their reservoirs are secure.

In the form of contracts for new schools and enlargements ordered by the London School Board there is the following clause:—"The contractor shall furnish each week to the architect a statement in writing showing the work and materials executed and supplied since the date of the preceding statement, if any, in respect of which the contractor may hereunder be entitled to payment as extras, and the price charged for every part of such work or material, and in the case of work to be paid for at cost price together with 10 per cent. on such cost price, such statement shall be accompanied with or shall be supplemented by such vouchers as the architect may require. And no work or materials otherwise chargeable as extras which shall be omitted from the weekly statement furnished

next after its execution or supply, or in respect of which no statement shall be rendered for the space of eight days next after its execution or supply, shall be paid for as extras by the Board." The works committee of the Board are of opinion that in the case of variations on the contract the architect of the Board should have the power to decide whether such variations should be allowed as day-work or measured up and valued at the rates in the priced bill of quantities. They accordingly recommend that the following words be added to the above clause:—"In the case of variations where day-sheets are rendered by the contractor and signed by the clerk of works, it shall be within the discretion of the architect to decide whether these works shall be allowed as day-work or measured and valued at the rates in the priced bill of quantities deposited by the contractor as provided for in clause 15."

THE following recommendations by Messrs. OSWALD & HANSOM on drawings submitted for prizes offered by the Northern Architectural Association are worth the consideration of committees of similar societies:—"We think that in future the Association should give more definite instructions as to the size and character of the drawings to be submitted. The size of sheets need not, we think, exceed half a sheet of double elephant paper. Sketches, whether in pencil, ink, or colour, should be submitted as finished on the spot, without being touched up afterwards; and should be of distinctly architectural, not merely picturesque, subjects. Measured drawings should be accompanied by the rough sketches and notes made on the spot from which they are compiled. The importance of plotting dimensions on the spot, including joints, cannot be overrated. It is practically impossible to achieve accuracy in any other way. Work of this kind should never be hurried over, and the finished drawings should show the very best draughtsmanship the competitor is capable of, preferably without shadow lines. As to the sketches, it may help the young draughtsman if we point out as models for his guidance the sketches of the late GEORGE EDMUND STREET, R.A., which were probably as fine and as practical as any ever made, virile in style, and free from all picturesque trickery."

THE annual meeting of the Iron and Steel Institute will be held on Thursday and Friday in next week, at the house of the Society of Arts. Mr. DAVID DALE will preside. One important function will be the presentation of the Bessemer Gold Medal to Mr. HOWE, of Boston, U.S.A. He will read a paper on "The Hardening of Steel." Among the other papers to be read will be the following:—"On the Manufacture of Steel Projectiles in Russia," by Mr. SERGIUS KERN; "On Metal-mixers as used at the Works of the North-Eastern Steel Company," by Mr. ARTHUR COOPER; "On Tests of Cast-iron," by Mr. W. J. KEEP; "On the Iron-ore Mines of Elba," by Mr. H. SCOTT; and "On the Effect of Arsenic upon Steel," by Mr. J. E. STEAD.

IN America the Southern Chapter of Architects, at the last convention, adopted the following resolutions:—"Whereas, the architect is in effect the trustee or agent of his client, and in that capacity shall endeavour to serve the client to the best of his ability, and to secure for him (the client) the full value received of the work under his charge; and whereas, it has been suggested to this convention that some material men have been tendering to architects commissions to secure the sale of their materials, the acceptance of which is contrary to our code of professional ethics; therefore, be it resolved that we, the Southern Chapter of Architects, condemn such methods as dishonourable and to be discouraged by all legal and honourable means. We further consider all material men, and others, resorting to such methods, as unworthy to hold business relations with members of this Chapter. Resolved, that after the board of directors shall have received sufficient proof of such practices or attempts, it shall notify the secretary, giving him the names of the parties transgressing, which names the secretary shall thereupon transmit to each member of this Chapter. Be it further resolved, that these resolutions be published, printed and distributed for the general information of material men, architects and the public at large."

ARCHITECTURE AT THE ROYAL ACADEMY—I.

THE 200 drawings which are hung in the architectural room this year represent fairly well the condition of business. The majority are dwelling-houses. In a builder's eyes the most important work on the walls is the design for Christ's Hospital Schools at Horsham, by Messrs. ASTON WEBB & E. INGRESS BELL, but as the works are not yet started it cannot be considered as an actuality. Public, that is, Government buildings, are absent, and the only costly municipal building which appears is the Darlington Town Hall, by Messrs. CLARK & MOSCROP. The design by Mr. W. H. BEATTIE for the new hotel and offices of the North British Railway Company in Edinburgh must have been very welcome to the Academic hangers, for it at least suggests the expenditure of a great sum of money. The drawings of churches do not betoken a very large outlay. In spite of the drawbacks which are imposed by economy, the collection is interesting, and if a few of the ordinary visitors to the Academy could be induced to visit the room, which is not likely, they would see much to attract them, for after all Domestic architecture appeals most strongly to the popular mind.

Among the houses there is as yet not much show of novelty. Mr. R. NORMAN SHAW has again appeared, but the Hallams, Surrey, resembles houses which he designed several years ago. He gives no sign of inaugurating a new era. The collection begins with a Design for a Town House, in Renaissance style, by Mr. FRANK D. COOPER; but the majority of the class are country houses. Mr. A. C. BREDEN shows one rather dull in colour. A House at Sutton Coldfield, by Mr. ERNEST NEWTON, is rather boldly treated, for while on one side of the entrance half-timber work is used, on the other side the windows are curved bows, so large that walls of another kind become necessary. Freeby Manor, by Mr. HARRISON, is rather large, and the half-timber work is properly treated. Mr. R. WILLOCK's Angle of a Country House might be a portion of some ancient example. The new Picture Gallery in Sir FREDERIC LEIGHTON's house is Italian, and is lighted by a dome. The walls have a green ground, and the door is in black. The Music-room in the steamer *Tantallon Castle*, by Messrs. NIVEN & WIGGLESWORTH, and shown on two drawings by Mr. PENNELL, has lightness of effect, and is, therefore, better adapted for a vessel than some designs which have appeared, and might have been intended for work on *terra firma*. The design for the Decoration for a Morning-room, in wood and majolica, by Signor FORMILLI, is very rich in colour, and it is a pity the whole of one wall at least was not shown. There is dexterous skill in applying colour in the two designs for ceilings by Mons. BOEKBINDER, the bedroom being as quiet as is desirable. Mr. E. GOLDIE shows a fine hall at Ashorne Hill House, with a gallery; part, at least, seems old work. The additions by Mr. COLLCUTT to Coldharbour, Liphook, make of it a charming residence, the interest of which was increased by the disposition of the garden. Mr. B. BINYON has a satisfactory wing and porch for Aldermaston Court, Berks. Earlsall, Fife, has been restored by Mr. R. S. LORIMER, and forms a group which should tempt many Scotch proprietors to have ruins treated as skilfully. Mr. VOYSEY's House at Colwall is simple but quaint, his desire being to make the woodwork harmonise with the green slates. The farmhouse at Brickendonbury appears in a very small drawing and is treated in a picturesque way by Messrs. COX. We should like to have seen a drawing of Mr. HALL CAINE's house at Peel. The entrance, by Messrs. SCOTT & MORRIS, might be part of an early Norman church. Shireoak, Headingley, by Mr. F. W. BEDFORD, is a very quiet country house that is in keeping with its position. Teith View, near Douné, N.B., is in a different style, but is also adapted to local conditions. The Premises in Uttoxeter, by Mr. W. T. WALKER, display more massiveness in the pilasters and mouldings than is usually adopted. The Garden Pavilion on the Edge of a Lake, by Mr. D. KENNEDY, seems to be an academic exercise in Italian, but it would make a satisfactory structure. The Free Home for the Dying, by Messrs. YOUNG & HALL, shows a block arranged round three sides of a square, and is as devoid of ornamentation and other vanities as such a place should be. The Bed-

ford Court Mansions, by Mr. A. F. VIGERS, is well adapted for its purpose. There is nothing commonplace about it and it is represented by one of the best drawings in the room. The Cottages at Ninfield, by Messrs. TREE & PRICE, are excellent examples of treatment in half timber. Messrs. ERNEST GEORGE & PETO are this year represented by two halls, Colworth, Bedford, and North Mymms, both very characteristic, the latter being the more important. The Marble Entrance-hall, Moorgate Court, by Mr. H. HUNTLEY GORDON, is effective and suggests the change which is coming over the commercial buildings of the City. The same architect has four designs for country houses in the style that now obtains most favour. In Duncombe Park Mr. W. YOUNG shows one of those Anglo-Italian mansions with which he succeeds. The arcaded wings are an efficient feature, but some proprietors would be likely to demur to their employment. The Staircase Hall, Gosford House, suggests the advantages of a pure Italian style for a mansion, for it is not only dignified, but it is less likely to run out of fashion than some other styles that are more sought after. In Little Missenden Abbey Mr. SETH SMITH continues to work in the spirit of the old remains. The Sundial, Whatton House, and the view of Leenside by Messrs. BREWILL & BAILY, show a mastery of old English work. The dial is one of the most interesting efforts of revival that has appeared of late years. The Dutch Library in a house, Glasgow, by Mr. A. N. PRENTICE, might have been imported complete from The Hague. Bearroc, Berkshire, by Mr. BELCHER, is one of the most important among the few large mansions which appear this year; it is in red brick, and is so arranged as to present many picturesque aspects. Mr. R. A. BRIGGS shows two views of a house at Oxted. The Gables at Harrow, by Mr. A. MITCHELL, is striking from the smallness of the windows. Another house at Harrow is more satisfactory, as there is no aiming at singularity. Among other country houses on the wall are some by Mr. E. T. POWELL, Mr. C. J. FERGUSON, Mr. C. J. BLUMFIELD and Mr. JOHN BROOKE.

The Summer Cottage, Isle of Wight, by Mr. ASTON WEBB, is suggestive of a similar work in which pride was said to ape humility. It has much interest as a design. The building is arranged so as to form a set of terraces, culminating with one on the tower. A great many delightful views are therefore accorded to the inmates. The wall near the sea is laid on a curve, and enhances the attractiveness of the house. There is a freshness about the treatment which just now, when stereotyped forms are so prevalent, is enjoyable. The Dining-room, by Mr. JOHN CASH, is shown on an excellent drawing in colour. The room is Old English in its treatment. The White Cottage, Caterham, by Mr. FEDDEN, derives much of its effect, at least on paper, from the contrast offered by the green outside shutters and the red tiles of the roof. Mr. HAMILTON GORDON's House at Folkestone is another admirable seaside residence; the porch especially is noticeable. There are other residences by Messrs. BEAZLEY & BURROWS, BEDINFIELD, CRESSWELL, KENYON and CAVE; cottages by Mr. T. PHILLIPS FIGGIS, additions to a house by Mr. BERESFORD PITE, and a mansion at Storey's Gate by Mr. BASIL SLADE. The Château de Buillon, by Mr. BRYDON, we suppose is somewhere on French soil, but it could not be more English in style if it were to be erected in Surrey. Mr. W. WALLACE contributes a large castellated mansion, Philiphaugh, Selkirk, which suggests the advantages possessed by the northern architects in having a style. Mr. SETH SMITH's drawing-room in Waxwell Farm, Pinner, is a cosy interior, the ceiling being kept low and the windows being marked by breadth rather than height. Messrs. DARBYSHIRE & SMITH's Galtee Castle, co. Cork, recalls some of Sir RICHARD MORRISON's large residences, in which variety was preferred to unity. Mr. BEATTIE's Hotel in Edinburgh should not be introduced among private residences. If carried out as shown it will be the most imposing block in Princes Street, and the unfinished copy of the Parthenon not far off, as well as other Classic buildings in the neighbourhood, must hide their diminished fronts when compared with it. Edinburgh is unable to compete with less admired cities in its hotels, and when a new one on the modern system was to be erected it was proper to give the exterior a character which could not be overlooked.

ASSESSMENTS.*

AS by natural equity or by compulsion every inhabitant of a State is expected to contribute to its expenditure, the fairest system of assessing the amounts would be by proportioning them to the incomes, or, as some would say, to the outlay of the inhabitants. Direct taxation has, therefore, many advantages to recommend it for general adoption. In principle it is simple, and if men were perfect it could be easily levied. But as long as they are unable to identify public interests with individual interests, they cannot be expected to sacrifice the latter. The men who in all ages have had most experience of the power of self are those who are concerned in the imposing and collecting of taxes. They were compelled to adopt measures which made them odious. The Hebrew publicans, the French *fermiers*, were only notorious examples of a class. What was possible in England is suggested by the conduct of the collector of the poll tax which gave rise to WAT TYLER'S insurrection. The universality of the objection to direct taxation is suggested by the number of countries with absolute governments in which a tax on income is not adopted.

Indirect taxation has therefore to be substituted. The poll tax, said MONTESQUIEU, is the most natural to servitude, the tax on merchandise is the most natural to liberty. Anyone who has observed the treatment to which women have to submit at the gates of a foreign town, in which the octroi local duties are levied on all merchandise that enters, will, however, agree in saying there is not much difference as regards personal dignity between the two classes. But without a scrutiny which is liable to become degrading there must be evasions of the duty to contribute. In England the every day scrutiny that is practised abroad would not be tolerated, and in consequence taxation becomes more onerous on all who have no wish or opportunity to escape their responsibilities. As MONTESQUIEU pointed out, much had to be sacrificed in England for the sake of liberty, and taxes were levied which were more burdensome than those imposed by despotic princes.

The difference in weight of burdens was more apparent than real. The foreign princes and their successors in modern times utilise many sources for obtaining money. In England they were always few. Let any ordinary man or woman count the ways in which he or she has to contribute to the revenue in the course of a year, and it will be found that in the majority of cases there is not a dozen of them. It is true the major part of the revenue is derived from indirect taxation, but if the amount for income tax and the rates levied on houses and lands are excluded, it will be seen that the indirect taxation is derived from no great variety of sources. Simple as are these facts, they are not sufficiently considered and turned to account. If, for example, the importance of rateable property in general as a source of revenue were understood, would not steps be taken to insure an uniform system, and one with fewer uncertainties than now prevail be adopted to ascertain the value of property? The massive volume which Messrs. BOYLE and HUMPHREYS-DAVIES have prepared affords in its pages enough evidence to demonstrate that such a consummation is desirable.

As there are nearly twelve hundred pages in their work, it would be impossible to give an adequate account of the contents. But they are justified in announcing that they have explained such principles as are at present in use in relation to the assessment of railways, docks, tramways, gas and waterworks, coal and other mines, electric-lighting works, manufactories and other hereditaments. There is also a complete digest of all the important cases.

The procedure for assessment which is now followed is derived from the Act for the relief of the poor which was passed in ELIZABETH'S reign. In most places the value of property is determined by an assessment committee of the Poor Law Guardians. It could not be concealed that such men would not be competent to deal with difficult problems. Accordingly the rental was taken as the standard. As the Act of 1862 expresses it, "The gross estimated rental for

the purpose of the schedule to this Act shall be the rent at which the hereditament might reasonably be expected to let from year to year." In the majority of cases it would not be possible to discover a more satisfactory standard. There are cases of rackrented property as well as cases which are let below their value, but we cannot always expect mathematical precision or uniformity of conditions in financial affairs. Taxes based on rent have the advantage of being easily calculated and collected. The percentage to be paid to the tax-gatherers can therefore be very low. As the French octroi duties, on the other hand, cost from 20 to 30 per cent. to collect, we can realise the advantage of our English ways.

If in the case of houses there was no more to be considered than the amount paid by a tenant to a landlord, assessing would be child's play. But houses have almost as many varieties in their assessable qualities as they have of other kinds. Consider the stately homes of England. Some years ago there was an outcry when it was discovered that palaces like Chatsworth and Belvoir were each rated on a rent of not more than 200*l.* a year. But the amount will not appear unjust if we remember that the then Duke of DEVONSHIRE, who was only a bachelor with refined tastes, declared that he could not afford to live at Chatsworth for more than a month in a year. The cost of keeping property of that kind in a becoming condition would be enough to deter the majority of people from becoming tenants at a rent of 200*l.* The method which JOHN STUART MILL recommends with grand mansions and in all cases where the occupier is the owner is as follows:—"A valuation should be made of the house, not at what it would sell for, but at what would be the cost of rebuilding it, and this valuation might be periodically corrected by an allowance for what it had lost in value by time or gained by repairs and improvements. The amount of the amended valuation would form a principal sum, the interest of which, at the current price of the public funds, would form the annual value at which the building should be assessed to the tax." MILL did not realise that at present the appointment of an expert who alone would be competent to undertake the calculations is merely optional. The duties fall upon assessment committees and overseers; and it is not imperative to call in a valuer. According to 31 & 32 Vict. cap. 122, the guardians may appoint some competent person to assist the committee, but in ordinary cases he could not prevent his valuations from being altered. Where an immense sum is at stake and a valuer of the highest class is called in, his figures would no doubt be respected, but most committees are fond of "cooking."

What is to be regretted is that so often architectural qualities are supposed to be of no account. We lately published the evidence before the committee of the House of Lords on "Betterment." It was explained by one of the witnesses that when he was valuing one of the Lambeth parishes he dealt with St. Thomas's Hospital as if it were a plain building. That was an advantageous arrangement for the governors, because the rates were diminished; but it was remarkable that not one member of the committee appeared to be amazed. Structural cost and structural value are not always identical, for a building may be erected to gratify a particular individual, and his taste may not correspond with that of other men. The authors put the case plainly when they say:—"No doubt a tenant would presumably give a better rent for a handsome house than an ugly one, and it may be that a public company or institution may derive pecuniary benefit from such an outlay, as it may act to a certain extent as an advertisement; but such an argument applies in but a small degree, if at all, to say the façade of Euston Railway Station, nor would a manufacturer care to give a higher rent for a cotton mill having the machinery silver-plated and the walls decorated with bas-reliefs by some celebrated sculptor, than for a mill, however commonplace, if it were capable of turning out as much work at no greater cost." The illustration it will be observed suggests something that has been stuck on a building or a machine, and in that way it corresponds with the notion that is prevalent in the courts. If plans had to be approved by judges before execution, we are afraid all buildings would resemble packing-cases.

We suppose it is only natural for people to depreciate the value of the property in order to enjoy diminished

* *The Principles of Rating practically considered.* By Edward Boyle, Barrister-at-Law, and G. Humphreys-Davies, F.S.I. Second Edition. William Clowes & Sons, Limited.

taxation. In the same spirit efforts are made to obtain entire exemptions from assessment for buildings. For example, it was hardly worthy of so wealthy a corporation as the Institution of Civil Engineers to endeavour to be put on the same footing as ragged schools, and no less strange was the effort of the Art Union to be classed as an institution for the fine arts exclusively. The authors say it is anticipated that the latter case may be carried before a higher tribunal, and it would be well for the council to gain an opportunity to prove how art is promoted by them. Of late years it has become more difficult to determine what constitutes an exemption. It has been held that a residence occupied by the chief constable and chief police officers within the precincts of constabulary barracks was not exempt. Government telegraphs are rateable in respect to local, municipal and parochial rates. In fact, the old doctrine that property occupied for public purposes was exempted is now entirely obsolete. The Mersey Dock Board and other local authorities are taxed for the light-houses under their control, while the lights in charge of the Trinity House are exempted. Many canals can claim exemption, but the same grace is not allowed to railways. A passage relating to builders' yards and other premises will suggest the ease with which anomalies creep into the assessment system.

Reference has already been made to land in the occupation of builders for the purpose of erecting new buildings, but, as in many other points in the law of rating, there are, owing to variations in the facts, many difficulties in the way of attempting to deduce from the decisions a clear and definite principle which shall be capable of application to each and every case. It is presumed that if a builder put up a workshop, as is often done, and put sawing and other machinery therein for preparing his timber for the house, no attempt would be made to rate him. If, however, another builder erected his shop and machinery elsewhere than on the site of the new buildings, and there prepared his timber and then carried it to the house, he would be assessable in respect to the workshop. This would seem to be unfair as between two men, as the beneficial occupation would be practically the same in each case. Take, for instance, some large public work like the Severn Tunnel. The contractor erects large workshops, with numerous workmen's cottages, schools and library, for no other purpose than to facilitate the construction. It cannot be doubted that the whole of these hereditaments would be rateable and rated. There appears, therefore, no reason why, if the property is of sufficient value to make the rate worth recovery, such property should not be rated. To avoid injustice, the overseers of a parish should take care to allow no undue extension of such immunities, but that directly the occupation appears to become sufficiently beneficial and permanent, the occupier shall be put on the rate-book.

There is consequently a contest between authorities and those who have interest in property. On one side attempts are made to lower the value and obtain immunities; on the other side, not only is it tried to keep up the valuation of the property, but ingenuity is exercised in discovering new sources of income in it. For instance, a public-house is likely to be rated at a higher sum if a good billiard-table is introduced. A new machine would be likely to increase the amount of the rates paid on account of the factory containing it. Mills that were not in use have been assessed as warehouses for the machinery they contained. The distinctions between the causes that enhance the value of property are so manifold, it is no wonder that so large a volume is needed for discriminating between them. Lovers of the good old times could make out an admirable case on the subject of rating. How different is the method now employed from that which was enjoined in the reign of ELIZABETH. In those days every parish was ordered to pay a certain sum weekly for the use of the poor, but no parish was to pay more than 6*d.* nor less than $\frac{1}{2}$ *d.*, and when one parish was considered with another the rate was not to exceed 2*d.*

Messrs. BOYLE and HUMPHREYS-DAVIES'S "Principles of Rating" is not merely indispensable for all authorities who have to deal with taxation, but it will be found interesting by students of political economy. Surveyors who may expect to be consulted about the valuation of property will find it to be a mine of information.

THE BOSTON PUBLIC LIBRARY.

THE enterprise which was displayed in giving the commissions to Mr. Sargeant and Mr. Abbey for paintings to adorn the Public Library in Boston, which have been exhibited, has had the effect of drawing the attention of Englishmen to the new building. The work which M. Puvis de Chavannes is now exhibiting in the Champ-de-Mars will have a similar effect upon Frenchmen. Means will, we suppose, be also taken to bring the building before Germans and Italians. We publish a couple of views of the Library from the *American Architect*. In the same journal the following criticism on it has also appeared:—

There is something amusingly childlike in the way and degree in which the Boston newspapers are glorifying the new public library building just opened to the public. If their statements are to be believed, never was so good a building erected, never was there so profound an artist as the author of the design, never were there wiser and more long-sighted men than the trustees who directed the arrangement of the building.

It is very nice of them to forget all the gibes and sneers that have been poured out on the library and those responsible for it, for never has there been a building which, as it developed, has excited more unfavourable comment both from those who do know "what is what" and from those who do not. We believe there is hardly a single feature of the building concerning which we have not heard some one speak disparagingly. The posts about the sidewalk kerb, of various size and pattern, some ornamented with checker-boards and broiled chickens, have afforded amusement to some, while the treatment of the southern façade with its lines starting off to go somewhere and never getting there, have amused others. Some have protested that the Guastavino arches would never hold up, while others deride the scrawny cresting. The scale and material of the sculptured panels above the entrance, and particularly the nakedness of humanity there displayed, have not escaped condemnation, while the huge elephants' trunks that serve as candelabra, and seem to threaten to snatch up and crush those who pass just beneath them, are generally disliked. The strange and sometimes rather illiterate jumble that has been made of the inscribed lists of literary and other celebrities can never be alleviated, and so it is regrettable that the excuse for a part of it, the anagram of the architects' names, was discovered. On the whole we much regret that this discovery was made, though it is said to have led to a discovery of a similar nature which revealed an attempt which, if it had been carried out, might possibly have stirred up an actual riot. Then, too, the general arrangement of the plan has been condemned without qualification by those who believe in the Poole theory of segregation. The amount of light provided for the different rooms was by some declared sure to be wholly insufficient, while others have scoffed at the idea of so small an interior courtyard, and protested that it should be glazed over and used as a reading-room. The form, material and colour of the external roof covering have been condemned by many, and the expense and makeshifts entailed by it have been criticised by those who profess to know about them.

The long and short of the matter is that the public library building has been a perfect boon to those who seek an object for semi-ill-natured criticism ever since it was started, beginning with the waste of 10,000 dols. on the first competition, the further waste of more public money in laying foundations for a building which was known to be a preposterous piece of imperfection and culminating with the appointment of an architect who was not a Bostonian.

We do not propose to discuss these various objections, nor do we intend to consider the building critically with a view to determining its derivation. The work is nearly done, the money has been spent more or less judiciously and the result stands, if not for all time, at any rate for the immediate future.

Looked at as a result, as a whole, we are disposed to find it satisfactory and to agree that, taking it on the whole, the money has been well expended, and that the accomplishment is worthy of admiration, perhaps less satisfactory than some other architect could have produced with the same outlay, but who can prove that?

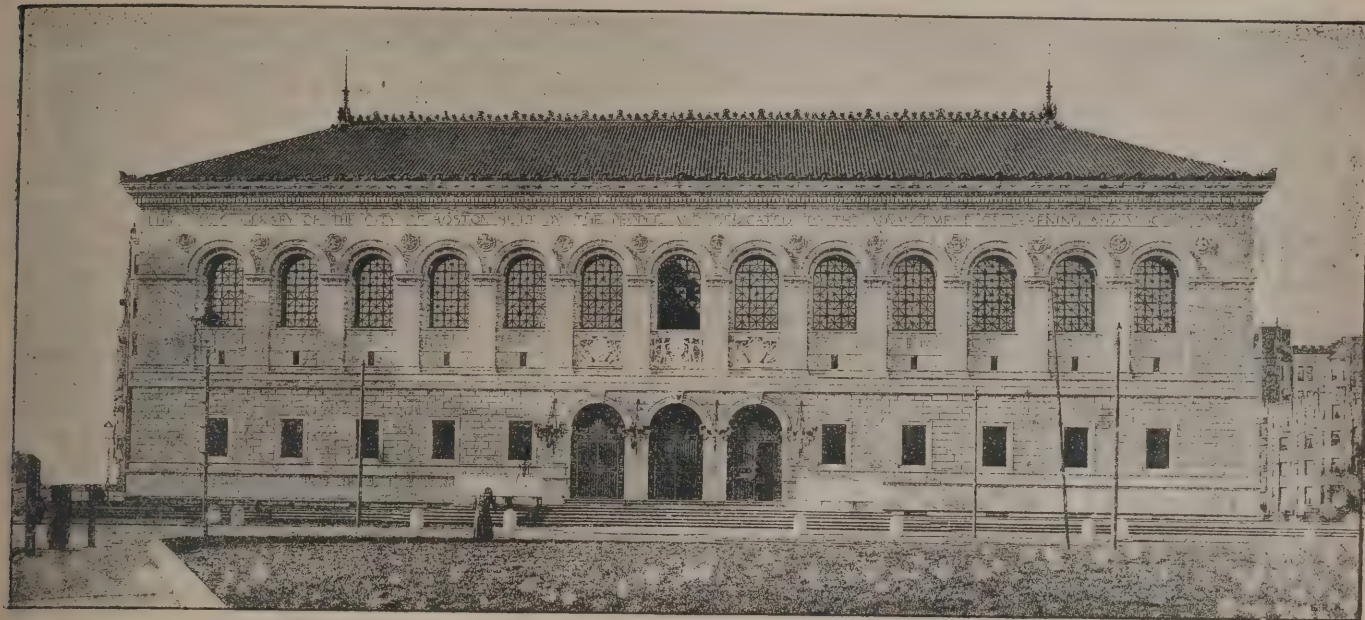
If, strictly speaking, there has been wasteful expenditure, we hold that on the whole the expenditure has been justified by the result. If the building is not above and beyond criticism, it is none the less the result of a more than commonly conscientious endeavour on the part of the architects, who rather than strive after successful originality have, from first to last, been content to adopt and adapt in their work those characteristics which have stood the test of time and earned the enduring approbation of men who are competent to pass judgment. One could wish there had been more of adaptation and less of adoption, for it is impossible not to feel that things might have been a trifle less hackneyed, without loss of abstract architectural merit. We do not believe that in the case of any given school of architecture the best work in that school might

Professor Hirschfeld, the German archæologist, died at Wiesbaden on April 19. He had charge of the excavations at Olympia during three years. The professorship of archæology in the University of Königsberg was assigned to him in 1879. Several important works were written by him.

not have been surpassed, or that it is beyond the range of possibility for a modern artist to carry the style on to a more advanced development.

There can be no gainsaying the extreme care, the con-

The experiment made at the Paris Hôtel de Ville, where artists of varied prejudices and different styles of work were employed, was not successful, though the ability of the men to whom the work was assigned should have assured success.



THE PUBLIC LIBRARY OF THE CITY OF BOSTON.

scientiousness, the painstaking endeavour that the architects have put into this work; they have been monumental, and if for no other reason than that work done in this way is a useful object-lesson, a considerable part of the outlay must be held justifiable. It is not possible to believe that the lesson will be without effect on other architects and other communities. If a result is to be good, time and money and understanding effort must be expended without stint, and as it is the fashion of the day in this country to believe that money is the only thing it is necessary to provide in order to secure a satisfactory result, it is small wonder that the actual results are so unsatisfactory as a rule. Clients are generally willing to provide the money, but they are rarely willing to grant time enough. Architects are amply able to spend all the money that may be provided, but there are not too many who know how to exert their efforts understandingly. It is rare indeed when all three requirements can be united and satisfied in a single piece of work.

Whatever may be thought of the exterior, and opinion as to the real merits of the exterior treatment is very varied, there is practical agreement by all that the effect of the interior is extremely good in so far as regards its architectural character. How far the applied decoration that is to follow will be successful in uniting the now somewhat disjointed parts into an harmonious whole can only be determined later. The final effect can hardly be guessed at, for the colour scheme is not disclosed and the part that colour is to play is so great that success, partial success or absolute failure in the work of the artist decorators may easily make or mar the whole. The reputation of the building as a work of architectural art is largely in their hands.

The reason, apparently, for the somewhat unsatisfactory result in Paris is that the work of the several artists is brought into too close juxtaposition, and as each man sought to make his portion more noteworthy than his neighbours, the result is a discordance and unevenness that is not pleasing.

Here in Boston the chances are somewhat better, the rooms are more isolated and each artist's work can better escape the jarring effect of an inharmonious neighbour's. Particularly is this the case with the staircase-hall, which is about as complete and independent a feature as a staircase-hall well can be. We confess to having some misgivings as to how far M. Puvis de Chavannes can succeed in making his treatment of the wall-panels harmonise with the strong rich colouring and high polish of the Siena marble of the staircase itself. For an artist whose aim is to decorate the wall-surface, to enhance the value of the wall as a structural necessity, and not consider it as a mere piece of blankness on which to present an arrangement of coloured pigments, we fear that the actual wall-space of the panels may be found somewhat inadequate. But if his treatment does not prove successful, the loss will be to himself and his work and not to the architects and theirs. No failure of the wall decoration, any more than the rather tame and ineffective lions of Mr. Louis St. Gaudens at the main landing, can prevent this staircase and its containing hall from being a satisfying architectural achievement.



ENTRANCE HALL, PUBLIC LIBRARY OF THE CITY OF BOSTON.

Bates Hall, while architecturally and structurally interesting, is an even more doubtful problem, for here the decorators have to decide how to bring into some sort of harmony the neutral and rather sad-coloured tints of the apartment and the harsh colour of the Nubian and verde antique marble door-finish on the west side.

The public is not yet ready to express an opinion as to how far the library is successful in its working, and though murmurs of dissatisfaction are heard, yet the fact that only a portion of the building is open to them leads the grumblers to express only qualified disapproval now, in the hope that when every department is in operation the causes of dissatisfaction will be found to have disappeared. At present the chief head of complaint is that, in spite of the elaborate system of pneumatic tubes, carriers and electric signals, and an enlarged corps of assistants, the actual distances are so great that a reader occupying a seat at the north end of Bates Hall is not served with even the rapidity customary in the old building.

A rather interesting incident transpired when the time came to move the statues and busts from the old building to the new, the Art Commission at this point suggesting that the placing of all public works of art was by law vested in them. As the president of the board of trustees of the library is *ex officio* a member of the Art Commission, there was no desire to gainsay the suggestion, and the Art Commission accordingly acted in the matter, and thereby established a very useful precedent which may be of utmost value hereafter.

TESSERÆ.

Reynolds's Experiments on Old Paintings.

IN his anxiety to discover the composition of the Venetian colours and to trace the system of laying them on, Reynolds is stated by Malone to have rubbed off the layers of paint from several valuable old pictures. Leslie doubts their value. "It is not credible," he says, "that he who told Northcote he would be content to ruin himself to obtain a really fine work of Titian could destroy an excellent work of any master. There is always an abundant supply of inferior old pictures, of the schools and times of all the great painters, in the hands of dealers; and as such pictures were painted with the materials in use by the best artists of their own time, it could only be such that Reynolds destroyed." Northcote, however, confirms the account of Malone, and says that the experiments were conducted at an immense expense. He remembered, in particular, that Reynolds once scoured down to the very panel a capital production of Parmegiano. Sir Joshua frequently restored damaged works of the old masters, "and often made them," says Northcote, "both in effect and colour vastly superior to what they had ever been in their original state." He retouched a ruined portrait by Velasquez of the son of Philip IV., "and to such purpose," says Leslie, "that few by Velasquez now look better." He painted a new background to a portrait by the same artist of a Moor blowing a pipe, "and with this, and some few other small alterations," says Northcote, "it became one of the finest pictures I ever saw." "These restorations of Velasquez," adds Leslie, "would, I am persuaded, amply compensate for whatever pictures he destroyed."

Old English Badges.

The badge that probably possesses the greatest local notoriety is the Pelham buckle, so well known on the estates of the Earl of Chichester, in the eastern districts of the county of Sussex. It may be found on nearly, if not quite, a dozen churches, on the old mansions of the noble family, and on their tenant farmers' houses. We pass by it as the sign of an inn, to find it again on the milestones by the roadside; we look over the hedge and see it marked on the broad haunches of flocks of genuine South Downs. John de Pelham, an ancestor of the Earl of Chichester, assumed this cognisance in commemoration of his having been present at the capture of the French king at the battle of Poitiers. Another badge, assumed from the same event, is that of the Earl of Delaware. It represents the crampit of a scabbard—the ornament at the end, which prevents the point of the sword from protruding—first borne by Sir Roger de la Warr. There can be little doubt that these two badges were originally the actual objects which they now pictorially represent, and had been part of the king's trappings torn from him in the desperate struggle of the different persons who claimed him as their prize. A peculiar description of badges worn by a few noble families were termed knots, being merely threads of gold or silver lace and parti-coloured silk, twisted and knotted into certain fantastic but distinct forms. When carried on stone this ornament frequently formed a continuous line of fretwork round a building. The Stafford, Wake and Bouchier knots are well known to antiquarians. Sometimes objects were chosen as badges which, from their designations bearing the desired sound, represented the name of the wearer. These symbolical puns upon surnames were known as rebuses. The comparisons of Mowbray, Duke of Norfolk, were embroidered with mulberries on that memorable occasion when he appeared in the lists "at Coventry, upon St. Lambert's Day." The badge of Arundel was a swallow—in French, *hirondelle*; that of Harrison, a hedgehog—in French, *herisson*. The rebus, however, was

mostly used by ecclesiastics, almost every bishop and abbot having one with which, carved on stone or painted on glass, they adorned their dwellings and the churches, colleges or other edifices that they erected, endowed or repaired. Many of these are still to be seen. The abbey-church of St. Albans displays in many places the rebus of Abbot Ramridge—the representation of a ram standing on a rocky ridge. In Abbot Islip's chapel in Westminster Abbey his name is represented in three different modes—an eye and a slip of a plant; a man slipping from the branch of a tree, and exclaiming, "I slip"; and the capital letter "I" beside the slip of a plant. The rebus of Prior Bolton of St. Bartholomew's, in London, was a bird bolt (an arrow) inserted in a ton; that of Bishop Middleton, the letter "M" in the middle of a ton. Alcock, Bishop of Ely, and founder of Jesus College, Cambridge, covered the most conspicuous parts of that building with the representation of a cock standing on a terrestrial globe, the latter being considered symbolical of "all."

The Neglect of Athens.

Till the year 1678 Greece was almost as much lost and unknown to Western Europe as Pompeii and Herculaneum. It is true, indeed, that more than two centuries before this time Ciriaco de' Pizziccoli, a native of Ancona, had visited the country in search of Greek inscriptions, of which he was such an ardent amateur that, being informed by a fellow passenger while he was on his voyage homeward of the existence of an ancient marble which had escaped his notice, he immediately left the vessel and went back eighty miles by land to examine it. But the "Itinerarium of Ciriaco," containing a brief account of his journeys in Greece and other countries, which he wrote at Florence in the year 1441, remained three hundred years in manuscript, and was first published at the same city in 1742. We have no account of any travels in Greece during the sixteenth century; and the only document from which we can glean any information concerning the then state of the country is a volume entitled "Turco-Græcia," published at Basle in 1584, and containing a history of the city and church of Constantinople during the fifteenth and sixteenth centuries, written by Greeks residing in that city, with a collection of letters from writers at the same place and of the same nation, addressed to Martin Crusius, a scholar of Melancthon, and professor of Greek and Latin at Tübingen. One of his correspondents, a native of Nauplia, assures the Professor that wisdom, science, arts, learning, valour, wealth, and all other good things, have departed from Greece, and that the Muses themselves have quitted Helicon and Parnassus, and have settled, he supposes, at Tübingen. The same writer reproaches himself for wasting words upon such a wreck as Athens. "Why," says he, "do I dwell upon the description of this place, which is like the hide of an animal that has been long dead?" From his conversations with another Greek, the Professor himself infers that Greece had ceased to exist in Greece and Athens in Athens. These and many other passages of this volume, in which the writers feelingly deplore the degraded and desolate condition of their country, would tend rather to discourage than to invite the curiosity of travellers, if the book attracted any notice at the time. But the letters are so dull in style and so barbarous in language, that few would be tempted to search for the little information they contain. From 1584 to 1678 we have still only two or three scanty notices of the condition of Greece, and these are so replete with fictions and absurdities that their authors could never have ventured to blunder, or to invent, with so much boldness, if they had not been assured that the ignorance of their contemporaries would secure them from detection. The following account of the Athenian Acropolis, which we find in a volume entitled "Archæologia Attica," by F. Rous, scholar of Merton College, published at Oxford, in 1671, could scarcely have been surpassed by Munchausen:—"This citadel now remains the succour and shelter of the barbarous Athenians, in which alone dwell janizaries to the number of seven hundred thousand, as Christophorus Angelo told me, and avouched it, I fearing lest he had mistaken the number."

The Serpent in Art.

In Francklin's interesting researches on the Jains and Buddhists he has given an interesting account of the "Serpent Worship." He observes that it was mixed with the Jewish ordinances; that the dragon, or great serpent, was worshipped in Babylon, in the reign of Cyrus, as recorded in the Apocrypha. Bryant observes that, in the orgies of Bacchus, the persons who performed the ceremony carried serpents in their hands, calling with horrid screams upon Eva, or the serpent. Thermitis, or Ob-oub, or Basileus, was the royal serpent of Egypt. The Cuthites had always some legends of a serpent. At Colchis, Thebes and Delphi the same worship prevailed. The serpent, according to Montfaucon, was a symbol of the sun; and Eusebius has observed that a serpent within a circle, touching it at the two opposite extremes, signifies the good genius, the Eudaimon of the Greeks. Vossius, in his 63rd chapter, on

"Pagan Idolatry," details the origin of the serpent worship, affirming that it commenced in Chaldea. Pythagoras brought the worship from Egypt to Greece, and thence it passed into Italy. The serpentine pillar of the Hippodrome, and the temple at Delphi, were erected in honour of Apollo, in commemoration of his victory over the great serpent Python. Esculapius, the Grecian god of physic, has a serpent emblem amongst his attributes. In Persia, Zoroaster, or Zerdusht, is represented as girded by a serpent; and in one hand of the figure, which represents the planet Saturn, is the serpent. In India the serpent Vasuka, whom the Surs and Assurs used as a rope in churning the ocean, is too well known to need description. In the time of Pausanias a statue of Minerva was to be seen at Argos made of marble, and which exhibited two serpents unfolded at her feet and protected by her shield. Colonel Francklin further notices that the serpent worship prevailed in Russia and other northern nations, and also in Mexico and Peru. Faber describes the Vitzliputuli, or deity of Mexico, as holding in his right hand a staff cut in form of a serpent; while the four corners of the Mexican ark terminated in carved representations of serpents' heads. Here also was the Cihnacohuatzi, or "woman of our flesh," who was represented with a great serpent. The Evil Being of the Goths is said to have had two children—death and an immense serpent, the latter of which wound himself round the whole globe of the earth. The Goths were a branch of the Cuthites, who came from the Indian Caucasus; and Thor or Woden is the Buddha of India, the great father of Scandinavian mythology, who dragged the serpent Midgard from the bottom of the sea. In Stonehenge the serpent Hu was venerated, and the circle at Abury enclosed two other circles, and was attached to an enormous snake formed of upright stones with a fourth circle for its head. This god is represented with wings. In conclusion he observes that it would appear that the royal sacred serpent of Egypt, the serpent Canophis or Cneph, as seen in the temples of Thebais; the serpentine deity of Persia as represented on the walls of Persepolis and at Nakshi Rustom; the serpentine devices of the Chinese; the globe and winged serpent of the Chaldean Magi; the great serpent Ananta Sesha Naga, and Vasuka, of Hindoo mythology; the Mexican serpent, and the Midgard of Scandinavia all spring from one and the same source.

Gothic Buttresses.

The whole northern buttress system is based on the grand requirements of tall windows and vast masses of light at the end of the apse. In order to gain this quantity of light, the piers between the windows are diminished in thickness until they are far too weak to bear the roof, and then sustained by external buttresses. In the Italian method, the light is rather dreaded than desired, and the wall is made wide enough between the windows to bear the roof and so left. In fact, the simplest expression of the difference in the systems is, that a northern apse is a southern one with the inter-fenestral piers set edgewise.

Old St. Paul's.

Are we to mourn with unmitigated sorrow over the demolition of Old St. Paul's? Of England's more glorious cathedrals none could be so well spared. Old St. Paul's had nothing of the prodigal magnificence, the harmonious variety of Lincoln, the stately majesty of York, the solemn grandeur of Canterbury, the perfect sky-aspiring unity of Salisbury. It had not even one of the great conceptions which are the pride and boast of some of our other churches—neither the massy strength of Durham, "looking eternity" with its marvellous Galilee, nor the tower of Gloucester, nor the lantern of Ely, nor the rich picturesqueness of Beverley, nor the deep-receding, highly decorated arches of the west front of Peterborough. Even in its immediate neighbourhood, though wanting a central tower and its western towers, not too successfully afterwards added by Sir Christopher Wren, the Abbey, with its fine soaring columns, its beautiful proportions, its solemn, grey, diapered walls—the Abbey, with its intricate chapels, with its chambers of royal tombs, with Henry VII.'s Chapel, an excrescence indeed, but in sufficient harmony with the main building, in itself an inimitable model of its style, crowned by its richly fretted roof—the Abbey of Westminster would have put to perpetual shame the dark, unimpressive pile of the City of London, Westminster modestly reposing in its lower level—St. Paul's boastfully loading its more proud, but more obtrusive eminence.

The Pnyx, Athens.

To form an idea of an Athenian assembly in the flourishing times of the republic, we must imagine the open space, the Pnyx, consisting of about 12,000 square yards, occupied by nearly 6,000 citizens seated in groups within it. In the presence of this vast multitude one man arises, he ascends the stone steps and takes his station on the pedestal, which is called the "Bema," at the centre of the perpendicular rock. He has before him not merely the 6,000 Athenians, but the city of

Athens. Lying at a little distance beneath him he beholds the Agora, filled with statues, and altars and temples, and he is thus brought into the presence of the great men of old, the heroes and the deities of Athens. Beyond it he sees the Areopagus, the most ancient and venerable tribunal of Greece; above it, on the right, is the Acropolis, presenting to his eyes the wings, the portico and pediment of the noble Propylæa; towering above them in the air, and looking towards him, is the bronze colossus of Minerva Promachus, armed with helmet, spear and shield, appearing from her proud eminence to challenge the world in defence of Athens; rising in severe and stately splendour to the right is the Parthenon, exhibiting its front of eight huge marble columns, surmounted with sculptured metopes and pediment, filled with marble figures of horses, men and gods, dazzling the eye with painting and with gold. Visible to the north, beyond the city and its walls, are the plains and villages of Attica, its cornfields, its olive-grounds and its vineyards lying in rural quietness, made more peaceful by its contrast with this stirring scene; further in the distance are the castellated passes of Phyle and Decalea, and in the horizon the high mountain-ridges of Parnes, Brilessus and Pentelicus. Such are the objects which the Athenian orator sees before him from this pedestal of stone. To his left is the road to Eleusis, the Sacred Way, which, passing through the beautiful suburb of the Cerameicus and by the groves of the Academy, and crossing the stream of the Cephissus, climbs over the western heights of Mount Ægaleos; visible in the rear are the two long lines of wall, which, running along the plain for nearly five miles, unite the city with the Piræus. There are the masts of vessels riding in the harbour, merchantmen bound for Pontus, Egypt or for Sicily; fleets which have gained for Athens empire and glory in distant lands—in the islands of the Ægean, in the peninsula of Thrace, and on the coast of the Euxine. Further to the left is the glorious Gulf of Salamis; on one side of it is the hill on which Xerxes sat to view the battle fought beneath him, and on the other is the Cape, where stands the trophy of Themistocles. Such is the scenery of the Pnyx, such are the objects which surround the Athenian orator as he stands on its Bema. In their presence he speaks. In dread, therefore, mixed with delight, inspired by such a spectacle, he proceeds to address his vast audience, like a general going to a battle, when he sees the flags and banners of his country's glory unfurled and streaming before his eyes. These objects are to the Athenian statesman and orator, standing on the rostra of the Pnyx, what his brave Epirotes were in after ages to Pyrrhus upon the plains of Italy. They are the wings which waft him to glory. They are also, if we may so speak, the levers by which he uplifts his audience, for they stir their hearts as well as his own. Let no one, therefore, wonder that in such a soil as this eloquence flourished with a vigour elsewhere unknown.

Scottish "Burghs."

The most perfect example of these remarkable edifices situated upon the island of Mousa, near to the mainland of Zetland; but many remains of them can still be traced both on the northern and western isles in Caithness and Sutherland, and on various parts of the north and west coasts of Scotland. They are nearly all formed precisely on the same plan, though differing considerably in size. The form is a truncated cone, occasionally slightly varied, as in that of Mousa, where the wall curves inwards till it attains a certain height, and then returns gradually outward again, apparently with the same design as the corbelled battlements of a later date, which enabled the defenders more effectually to annoy any assailant who ventured to approach the base. With this exception the exterior displays no ornamental projections or any provision for defensive operations, by means of window, loop-hole, or machicolation. The rude but very substantial masonry of the exterior is only broken by a plain, narrow doorway, which, from the absence of gate-posts, grooves, or any of the ordinary refinements of more modern architecture, it is not improbable was secured, when danger was imminent, by building it up with a pile of stones. Within the exterior cone a second cylindrical structure is reared, the walls of which are either perpendicular or constructed at an angle which, leaving a space between the two of about 6 feet at the base, brings them together at the top. Within this space between the walls a rude staircase, or rather inclined passage, communicates round the whole, and a series of chambers or tiers of interspaces, formed by means of long stones laid across from wall to wall, so as to form flooring and ceiling, are lighted by square apertures looking into the interior area. This central space is open to the sky, and the fact of the only light to the chambers and passages within being derived by means of apertures opening into it, seems to preclude the idea of its ever having been roofed. It is not apparent, however, by what means the occupants could obtain access to the ramparts, so as to resist an assault and prevent the walls from being scaled, though a sufficiently rude and simple wooden structure may have supplied this very obvious defect.

NOTES AND COMMENTS.

ALTHOUGH many inquirers have occupied themselves with the history of ALBRECHT DÜRER, that subject is unfortunately still incomplete. Happily, the gaps are incentives to research. The latest discovery is that DÜRER, about the year 1503, was occupied with wall-painting and ceiling-painting in the castle of Wittenberg. The room entrusted to him was known as the "geschnitzte Stube," probably because it was adorned with carving. Apparently the paintings remained until 1611, but after that time there is no record forthcoming which relates to them. The castle suffered during the Thirty Years' War, and afterwards during the Seven Years' War. It was not spared during NAPOLEON'S invasion. It now is used as a barrack. During the repairs and alterations DÜRER'S handiwork may have vanished. On the other hand, there is a possibility that a part of it may be found under the thick coatings of whitewash to which the castle was subjected. It is therefore proposed to appeal to the Emperor of GERMANY for permission to have some experiments tried in the most likely places, and as there is nothing unreasonable in the supposition that DÜRER'S paintings may be partially preserved, we may suppose that something will be done to clear up the doubts.

ART is undoubtedly advancing in the United States, and it would not be surprising if some of the cities endeavoured to rival those in Italy by patronising artists. In spite of the warning which the failure of the wall-paintings in London and Munich might be supposed to express, it was decided lately that the Congressional Library was to be enriched with wall-paintings. Commissions for the purpose were given to Messrs. BLACHFIELD, LA FARGE, VEDDER, GUTHERZ, SIMMONS, MAYNARD, KENYON COX and DODGE. The determination to undertake so much costly work must have a beneficial effect on many kinds of decoration. The position now attained by mural painters in America becomes evident when it is found that they have formed a Society. The aim of the founders is to promote the delineation of the human figure in its relation to architecture, whether rendered in pigment, stained-glass, mosaic, tapestry or other appropriate medium, and at the same time to foster the development of its ornamental concomitants. The members of the Society are not only to be qualified to depict an expressional figure composition in a given space, but also to plan and control the entire decoration of a building. There would be something of a revolt against the architect's office if the planning and controlling were insisted on, but we assume what will be done is to offer suggestions to architects. Mr. JOHN LA FARGE has been chosen for the first president of the Society. He has executed many decorative works, and some of his designs in the exhibition of the Champ-de-Mars this year have excited the interest of Parisians as well as his countrymen.

THE report of the Council of the Manchester Whitworth Institute states that the interruption of the original scheme by the removal of the great schools, besides other causes, has occasioned certain changes in the body of governors, rendering a revision and renewal of the list desirable. The Council consider that the provisions of the charter of the institute should be carefully revised. While the schools were still included within the undertaking of the institute, specifications were issued for proposed buildings on a comprehensive plan. Twenty-three designs were sent in, and Mr. WATERHOUSE, R.A., as referee, named those which appeared to comply best with the printed instructions and with the economic views of the Council, the plans and designs of Mr. J. W. BEAUMONT, architect, of Manchester. While contemplating the establishment of the full scheme of the Manchester Whitworth Institute as originally laid down, the aspirations of the Council had been buoyed up not only by hopes confidently held out to them of large contributions from friends, but also by the expectation of a substantial subsidy from the Corporation. The latter, of course, fell to the ground when the city took over the schools, and the former promises have not yet been fulfilled. The legatees of Sir JOSEPH

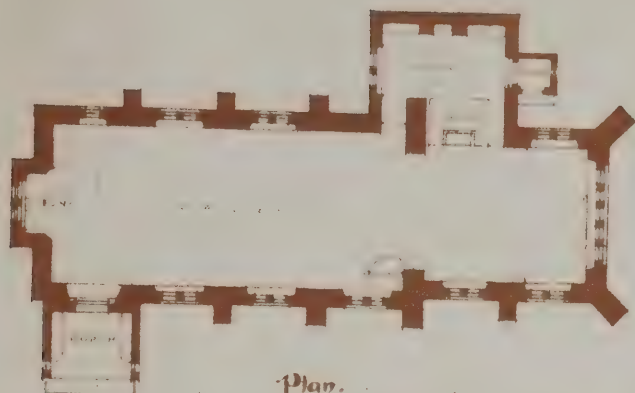
WHITWORTH have practically given to the Institute (exclusive of 60,000*l.* appropriated to the Technical School) a sum of 157,000*l.* They cannot be expected to give more. The guarantors of the Royal Jubilee Exhibition have given 20,000*l.*, and two donors 500*l.* each, for the purchase of works of art. The Council cannot, however, but consider that for the effectual development of the institute, even under its more compact scheme, the public will have to be invited to interest themselves, by donations and subscriptions, in its welfare. The Council have been able, by an endowment of 50,000*l.* from the WHITWORTH legatees, to arrange for the erection of galleries for the custody and exhibition of the gifts and purchases. The committee obtained and carefully revised the plans prepared by Mr. BEAUMONT for a simple and effective arrangement of a north gallery, 78 feet 6 inches by 32 feet 6 inches in width, on the north side of the park along Denmark Road, with a central gallery extending southwards 79 feet by 39 feet connected with it behind the present house, leaving the latter for committee-room, library offices, &c., and for future replacement by a principal building with its own important façade. The buildings are so arranged as to admit of extension when required. The galleries will reproduce in character the picture galleries which proved so effective in the Jubilee Exhibition. On July 27, 1894, the Council finally approved of the plans, and, having taken tenders, resolved to accept that of Messrs. R. NEILL & SONS, to build the two galleries and complete the necessary alterations in the house, for the sum of 10,264*l.* The contract was forthwith completed, and the works are now in progress and already indicate their character and extent. It is expected that the new galleries will be ready for occupation in the summer of 1896.

THE Governors of the Bow and Stepney Foundation Boys' School are about to add to their present school buildings a science department, and have selected, from a limited competition, the designs of Messrs. THOMAS & HOWARD CHATFIELD CLARKE. The additions will include a chemical laboratory, with preparation-room, a lecture theatre, physical laboratory and mechanical instruction-room. The additions will form a complete wing, in themselves, to the present building, and the elevation to the wing has been made to harmonise with the existing premises, which are situated in Tredegar Square, Bow. Messrs. THOMAS & HOWARD CHATFIELD CLARKE have recently completed the new chemical laboratories for the Cowper Street Schools, and also those for the Mercers' Company's School in Holborn.

WE are asked by Mr. STOKES to make it known that he has a few back volumes of the New Series of the "Sketch Book" still on hand, which he will be glad to dispose of for the following reasons: *i.e.* having completed the New Series, it is necessary to close the accounts, and in order to meet the last of the liabilities it is desirable to realise the only asset, viz. some twenty copies in all of the last three or four volumes. During the whole of the thirteen years over which the New Series has spread itself, the committee have always paid their way, but matters were cut so finely that, in order to settle the accounts, the whole of the volumes printed must be sold. "I think it is generally admitted," adds Mr. Stokes, "that the volumes of the 'Sketch-Book' are about the best value for the money that can be obtained anywhere. I therefore trust that when it is known that the sale of the last few copies of the Series will enable the committee to send a final cheque to the printers, there are many who will feel disposed to lend a helping hand. I should, perhaps, mention that each volume contains seventy-two plates, a title-page, and index, and is quite complete in itself. The price is one guinea, unbound, and we have copies of volumes 7, 8, 10 and 12. I shall be glad to send copies on approval if desired, but as the whole series can be seen at the British and South Kensington Museums, the Architectural Association, and the Royal Institute of British Architects, I trust I may receive nothing but orders (enclosing cheques), which shall be promptly attended to."



3rd 1895.



Y CHURCH.

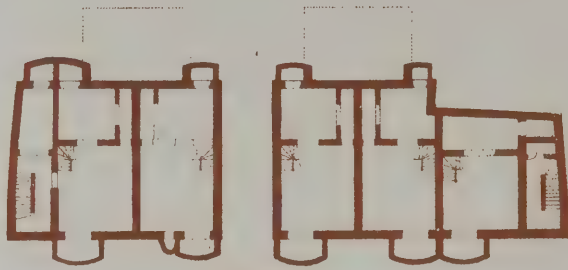
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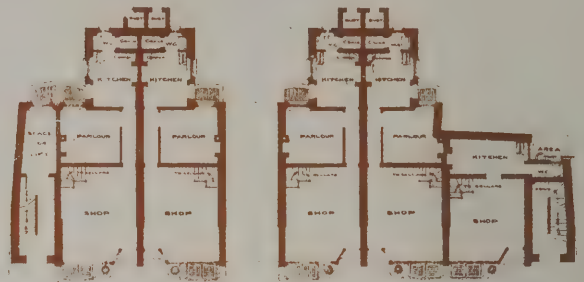
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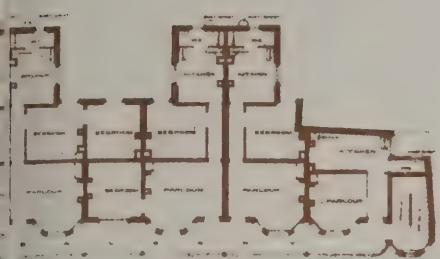


BASEMENT.



GROUND PLAN.





PLAN OF DWELLINGS.



ILLUSTRATIONS.

DESIGN FOR COUNTRY CHURCH.

SCREEN IN THE GREAT HALL, AUDLEY END, ESSEX.

SPA MANSIONS, BERMONDSEY.

THE block of model dwellings shown in the illustration stands on a site at the corner of Spa Road and Grange Road, Bermondsey. The building, which has a frontage of 106 feet, consists of basement, ground floor and four storeys, surmounted by a flat roof. The entrance is by a staircase on the extreme right and left, terminating in towers on either side. There is also a spacious lift for the purpose of taking up furniture, &c. The front of the building is set back on the first, second, third and fourth floors to admit of wide balconies, by which access is gained to the several dwellings. The ground floor is devoted to shops, of which there are five, and an archway in the centre leading to a courtyard in the rear to be used as a playground for children, &c. The staircases and balconies are of artificial stone. The floors are virtually fireproof, being of rolled iron girders filled in with coke breeze and cement.

The basement is devoted to cellars which are attached to the shops; also the lift, &c. On each of the upper floors are five suites of rooms, most of them unusually spacious, and each set is supplied with kitchen containing a kitchener, sink, copper and dresser, with a w.c., dust shoot, and provision for coals. Every room is ventilated into a shaft, and there is abundance of light everywhere. Windows are placed at intervals up the staircases; in fact, there is not a dark corner in the whole building. The tenements are arranged as if they were a number of cottages placed in rows of five, each row stacked one above another. The balcony represents a footpath, and the front doors open on to it, so that there are no hidden entrances, as all the doors face the street. The front room is supplied with a bay window, and each set of rooms resembles as nearly as possible an ordinary house. Every tenant, therefore, can sit at his window and either see the traffic in the street below or the extensive views obtainable over the neighbouring houses. While the building is one as regards its structure, every set of rooms is isolated as much as if upon the ground. The roof is cemented and is to be used for drying purposes. The building was erected by Mr. JOSEPH DOWN (the owner), with picked stock bricks, with red brick arches and label over same. The cornices to towers at eaves are also in red moulded bricks. The architect is Mr. JOHN JAMES DOWNES, of 11 The Parade, Lewisham.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening, Mr. E. W. Mountford, president, in the chair. The house list for the session 1895-96, as prepared by the committee, was read, Mr. Caröe being nominated as president. Mr. C. W. WHALL read a paper entitled

Painting, and its Relation to Architecture.

He said:—It was a very large and difficult subject at any time—one to which a single lecture could give but the barest and the baldest outline. The more so, when they were lately told by the President of the Royal Academy (in his speech at a recent Academy banquet) how deeply we must be struck with “the vehement and almost feverish strife of conflicting theories and opinions which is rife about us”—a description not overcharged.

I hope you go to picture galleries. I hope you go often. You will soon have them thrown open to you in lavish abundance, and I will speak my few words now with the view of your being able to use them as a sort of guide which may give you some small help in steering your course amongst the conflicting schools and systems.

First, then, let me make to you the probably disillusioning announcement of my firm conviction that the one great, peculiar, characteristic virtue pertaining to the art of painting is the deft and exquisite laying on of paint. Small, simple, half contemptible as this may seem, it is the only key to the study of the art of painting, and I want to direct your keenest attention towards it, in order that you may be able to search for this quality in pictures, and know it when you find it. I

cannot recommend you to begin your search for it in the exhibitions of to-day, but go to the National Gallery and look carefully at the drapery in Veronese's *St. Helena*, and try to realise the felicity of Ruskin's description of the painting of Veronese. I cannot find the quotation, but he describes it as consisting of touch after touch laid on with a balanced, trained and instantaneous skill similar to that of his finest fencing.

Look for yourselves and see the light come rippling down the edges of the folds, not in clumsy zigzags but in touches sensitively modelled from end to end, so that no two points of them are alike, and yet put there by a hand working at lightning speed, but with the same control with which the most perfect violinist pours out the cascade of his melody. Just look at the shape of each of the little touches of high light with which some sheen upon the silk dies away. Each is like the petal of a flower. Look at the shadows, liquid and deep; like shadow, you can look down into them as you look down into those of running water, the same transparency, yet mystery. See how the colours have been floated over one another in thin films with the most absolute knowledge of what effect the colour below will have seen through those veils, how each will operate upon each; and you will soon begin to recognise that this is an infinite science, that such a painter, like a great composer in music, out of the infinite numbers possible to him, fuses together by the flashing instinct of his genius in one vivid moment those which will make the harmony at which he aims. Do you think me too enthusiastic? That such a trivial thing as laying on moist pigment with a hog-hair brush does not call for all this warmth? Well, let me justify it by a contrast. Walk away from the Veronese and look at the painting in one of Landseer's pictures—and I purposely choose as example the cleverest work I can find to point out to you the difference between cleverness and genius.

With your eye full of the sweet tremulous iridescence of the *St. Helena*, where you cannot put a pin's point upon two bits of colour exactly alike (any more than you could upon the same thing in nature), look at the Landseer; a mass of opaque splashes, where you can tell to a hair's-breadth where a square inch of yellow ochre leaves off and one of Roman ochre begins. Look at the high lights, like chalk marks, and the “high darks,” like ink marks, and if you think that at any rate the hide of the dog is a triumph of skill, just go and look how Holbein paints fur in his picture of *The Ambassadors*, or in the portrait of Christina of Sweden, Duchess of Milan. Then take another look at the Veronese, and then go back to the Landseer; you will feel as if, after watching some graceful and skilful dancer, the rustling of silks and the sound of music, you had suddenly presented to you the vision of some country clown plodding in miry ways.

But now let us pause a little. You will be asking me, “What, then, do you mean to say that Landseer's work is all bad art, and of no use?” If I were to say such a thing I could not stop at saying it, but should have to include far higher names, and tell you that the art of Michel Angelo and Leonardo da Vinci was also bad and of no use, for in the sense in which Venice understood the word, and the sense in which I am speaking, neither of these men could paint. The same might be said in a less degree of Raphael, of Botticelli, and an aching void indeed would have been left in the world's story if the work of these men had been left undone.

Yet the history of the world has been ever full of mistake and perplexity; malicious fortune seems ever bent on putting the square man in the round hole and marring all our chances, and we need not, out of reverence for these great beings, refrain from asking ourselves why Fate did not permit Botticelli to complete the painting of the Sistine, and provide for Michel Angelo instead some tremendous cathedral front of sculpture which his hand would have been so much more able and so much more fain to do. But things being as they were, we may be thankful that those grand forms have been presented to us, though we may wish that they had been in marble instead of fresco. The peculiar virtue of sculpture is noble form as that of painting is splendid colour, but you are to note that there is always a special hand skill which goes with each, and is probably therefore inseparable from it, and is that on which it depends. In painting it is that swift sensitiveness of touch which I have tried to describe in Veronese, and Mr. Ruskin compares to fine fencing, and in sculpture the same thing is true. Nobody, I am sure, can look at a half-carved figure of Michel Angelo's without seeing that the toolwork there has been of a kind almost as perfect and unerring as the work of nature. And yet so distinct is the sculptor's peculiar virtue from that of the painter that the man who could do such work as this in marble was so poor a painter that if his painting had been spent on anything but the noblest forms it would have been simply insignificant—we need think no more about it—whereas we could not look at a single square foot of any fine Venetian picture upside down without seeing that it is the outcome of a skill and training and hereditary fineness of breeding which must give us constant argument for hope and faith in the dignity and perfect ability of the human race.

Those of you who may happen to have seen in any exhibition any of my own poor efforts in art will be surprised to hear me insist so strongly on this purely technical skill. I do not undervalue high ideal, exalted thought, fine allegory, poetic intention, religious fervour—rather, perhaps, by nature I am tempted to lean on them too much; but it is my duty to tell you the truth, which came neither quickly nor easily to myself, but which is all the more sure for its having been slow, that all these things, all these fair thoughts and aspirations and ideals, good as they are in themselves, are only of the nature of good intentions (and we know where *they* go) until they have shaped themselves into deeds worthy of them by fine craftsmanship. A work of art which appeals from manifest technical shortcomings to the lamely-expressed goodness of its purpose damages more than aught else can do the cause it pretends to advocate. Really earnest workers in the same arts who are in search of example and strengthening will submit it to stern testing and questioning, will find it a broken reed and throw it aside, and without pretending to any inspiration from like motives, will outdo it themselves, and pass it by until the world itself will at last discredit it, and the final impatient comment on it will be, "Yes, yes, yes, we know what you want to say, but show us what you can do."

The warning of these dangers, then, is needed—and especially by you; for the kind of painting which architecture draws into fellowship and co-operation with itself is (much to the honour of architecture) almost always of that kind which starts with high motives and deals with high themes. It is for this reason that I have been at such pains to point out to you the special technical and craftsmanly virtues of fine painting. I have brought these things, therefore, into sharp relief and contrasted them with those more mental and contemplative qualities which form so constantly the motive, and the expression of which is so often an ingredient in a work of painting.

But though I have brought them into contrast to show that they are two entirely different things and to show you their respective values and places, do not run away with the idea that they are therefore incongruous qualities which in any sense exclude each other, or between which there is in the nature of things any inevitable jealousy or contradiction. Thank heaven that is not so. It is theoretically possible, no doubt, that these things should exist in entire separation and that the art of a Veronese (retaining all its splendour) should spend itself on mean and trivial things. But if you spend a half-hour in the Dutch room at the National Gallery and then walk into the Venetian room, you will not only feel that you are in the presence of a totally different and immeasurably higher skill of the human hand, but that the same transition has lifted you also into an incomparably more lofty mental atmosphere and that you are in the presence of a much finer manifestation of the human soul.

Now it would be impossible for me, even if I were a fine painter, to give you a demonstration of the qualities I have been speaking of in a short lecture, and by artificial light. But there are certain things which I can show you by way of illustrating the resources of painting.

Here are a series of tints. I am afraid you cannot see them to much purpose by this light, but at any rate you can see that there is a good deal of variety between them—that this one, for instance, might be called purple, and this orange; yet they are only the results of two different ways of using exactly the same pigments. You would think, if you know little of colours, that a colour diluted would always be a fainter version of itself, that a colour strengthened would always be a stronger version of itself, and that, indeed, is the rule in colours modified by mixture. But in fine painting colours are modified quite as much by superposition as by mixing; and that is the process I have here employed in its two great forms—glazing and scumbling. Glazing you will easily understand as the superposition of transparent colour; it is at the root of all Venetian excellence and brilliancy. Scumbling is an unfortunate word, which always sounds like a bit of artistic slang, and has therefore time out of mind been used in trivial literature as the cognomen for a typical painter—"Mr. Scumble, R.A."—yet it is a fine process, though the word is awkward, and he who knows how to use it is so far forth a painter in contradistinction to the man whose whole method of procedure consists, as in innumerable instances too modern to be quoted it does consist, in the mere mixing of colour together, and who is familiar to us all under the name which, with an innate sense of fitness, was poor Charles Kean's invariable pseudonym for a painter in the pages of *Punch*, "our old friend 'Stodge.'"

These, then, are all examples of the effects to be obtained by the varied handling of one colour (a very modest one, burnt umber) and white. This, which I have ventured to call purple, is white thinly scumbled over a dark space of burnt umber. This which I have called orange is the exact reverse, burnt umber thinly glazed over pure white. Those between are varieties of the same process in the degree of the thickness and darkness of the two colours used, and you must at once recognise the fact that, seeing that any one degree of the white

can be modified with the whole gamut of the umber, and any one degree of the umber by the whole gamut of the white, you are in the presence of a problem which is practically infinite; and when we consider this extended to the use of a full palette of pigments, we can understand that the choice of harmonies is as inexhaustible as in the case of music, and that a true colourist in the mere manipulation of his materials exercises the same kind of regal command over infinity as the composer of a fine sonata.

Having shown you how much can be done with simple means, I wish to insist upon the vital importance of working with simple means until their limits are reached. It is a very good thing to have perfect tools to work with, but you do not need me to tell you that a man who cannot do anything without extensive paraphernalia cannot do anything at all. This dependence upon lavish means is, however, such a pestilent disease in all the arts of the present day that I shall spend a few minutes in emphasising the value of their simplicity. And I cannot do so better than by trying to illustrate my point by reference to your own art. I am sure you will approve me when I make the reflection that a man who cannot build anything presentable in brick will not mend his case by falling back upon marble. On the contrary, while in the former his dullness, being unassuming, may escape censure, the presumption implied in his dealing with a noble thing will most justly call it down upon him. It is a characteristic of all great art that it exhausts the means used, and the more elaborate these are the greater the difficulty of the problem. Now nothing depends so little upon elaborate means as fine painting. Give a painter who knows his craft half a dozen brushes and half a dozen colours and the whole world is his own, while every fresh pigment added to the palette is a fresh danger and chance of failure. I remember some years ago in one of our exhibitions a case showing the development of a coloured illustration in either the *Illustrated London News* or *Graphic* in all its stages, there being, if I recollect right, fifteen or sixteen coloured stones employed. The drawing was a dashing, clever thing enough. It was called "United Service," and represented two handsome young fellows, in the dress, respectively, of the army and navy, escorting down the stair from the ball-room a young lady in white. The first few printings which showed the tints of the flesh and the delicate pencil-like marks of the shading had positively an air of great refinement. One thought the Caton Woodville or the Overend halfway towards being a Whistler, a "song in stone." The warm tones were printed first, and there were some delicate saffrons (azaleas and so forth on the stair), working up through the white to flesh colour. So far all went well, and though none of the printings after the first four or five did anything but harm, still the thing remained in a kind of key, and even the red of the soldier's coat, vulgar as it made the print look, did not render it positively unbearable; that was reserved for the blue-black of the naval uniform, which came crashing down upon the thing like a brass band out of tune, and sent one away saddened to look at the next inanity in the catalogue.

Now this contained a great lesson, and a most important one for you, gentlemen, for that simple palette which I have been advocating brings as its natural result work painted in a key. Look at much of Burne-Jones's work—those cartoons which he paints in brown and steely blue—at his pictures, too, in the same tones, of *The Annunciation*, *The Fortune*, *The Merlin*, and the series of the story of Perseus, and tell me if they are not noble colour. And in a more delicate and dainty key look at Whistler, with his nocturnes of blue and silver, grey and gold, or what not, and (if he has not shaken the dust of this ungrateful country from his feet for good), go next time he holds an exhibition and (and this will be coming near home to you indeed) see how he decks his room, working up from the white of his woodwork through the pale fawn or lilac of the matings and distemper, the cool, neutral metal of the picture-frames, which are neither silver nor gold, to perhaps some warm russet in the upholstery, and a sudden blaze of gold and crimson on a glowing screen.

There is nothing I should think more necessary for you architects to bear in mind in using painting in conjunction with your buildings than this question of working in a given key, and I purposely directed your attention at the outset to that particular picture of Veronese, because it is so beautiful an example of it. And that curiously because it is an unfinished picture. That lovely over-robe of Venetian red was doubtless meant to be glazed with luscious crimson, and I must not refrain from the temerity of recording my opinion that it is better without it, that even the great Venetians were mortal and sometimes revelled in the wealth of their means and splendour of their powers with a luxury too unrestrained. Certain I am that Tintoret for this reason comes to me with a deeper appeal than even Veronese, and that of the latter his unfinished pictures, this *St. Helena* and *The Annunciation* in the Accademia at (is it Florence or Venice?—the angel has red drapery like that of the *St. Helena*) and the noble pictures in the Ducal Palace, at Venice, where he keeps to a key of white

and gold, are to me his finest work. And whatever question there may be about that, I think there can be none of the fact that in nine cases out of ten they would serve the purposes of architecture better than those which look like a parterre of flowers. So remember, gentlemen (no doubt you will find it quite easy), next time some patron introduces you to his favourite R.A. to decorate the mansion or the church that you have built, tell him what keys of colour will harmonise with your intention, and what pigments he may use; remind him that you are the master of the situation and that he must do as he is told. You will get some valuable or, at any rate, emphatic information on the relationship between painting and architecture, with a good stout hook to hang it on.

I have now said all I can to direct your attention to what I will call the proper specialty of painting as a craft—that which belongs to it and to nothing else. I believe that it is the most necessary thing for you to know in starting your study of painting, and all the more so on account of that which I have alluded to as so encouraging a fact in the present day—that the arts are seeking to found themselves on the fine forms of craftsmanship proper to each rather than on academic theories and vague forms of dreaming.

The tendency of the arts at present, then, is to specialise themselves; but is their tendency also, then, on that account to isolate themselves? One would fear it might be, and perhaps a search through the world of modern art would afford us some ground for supposing that it is. But I am certain that that would be as nothing to the arguments, growing daily stronger and stronger, for the opposite conviction, which has been cheering the heart of every craftsman and art-worker in the kingdom during the last few years with ever-growing appeal—a conviction that, in the searching after the special and individual excellences of each craft, is being in reality rapidly discovered the proper ground on which they can all unite. You, gentlemen, by your study of the noble art which you have chosen to be your life's work, are preparing to stand in the place where, by the nature of things, all these various arts, which are so rapidly coming together, must meet. It will be your safest guide, I believe, in that perilous and responsible position, to remember that they meet there in virtue of their common motive, beauty, and that their common passport to that enchanted ground is craftsmanship.

This age has been too much swamped and stifled by academic methods of study, and it is certain that for a long time yet much instruction must be given in this way (what, indeed, am I doing at this moment?).

Yet, side by side with your lectures and treatises, take every chance that offers of learning at the bench or on the scaffold, at the anvil or at the easel. Where you see work going on ask technical questions, which will do good to him you ask as well as to you; and take every opportunity of getting at the actual tools and the actual stuff.

But "the bearings of these observations" (to quote the immortal Bunsby) "lays in the application on 'em." And now that I have tried to give you a general clue to the subject by establishing some first principle, let us turn our eyes upon the field of modern effort in painting, and try to find our way. And none too soon, for, gentlemen, you probably know—if not, I am happy to tell you—that cabinet pictures are a drug in the market, and you will very soon have all the jarring schools clamouring round you for employment. Indeed, if I live for another twenty years, I shall not be surprised to see—I shall expect to see—and, need I add, I shall most thankfully rejoice to see—architecture the acknowledged leader, ruler and guide of all the arts in this country.

Looking at modern painting we find two main schools, the poetic and the realistic. They are not necessarily in conflict, but the critics have determined to consider them so, and have so talked about them and egged them on that the painters themselves, I think, have got confused, and we must consider the schools as opposed.

Let me quote a few sentences from modern criticism. They shall all be from the same number of the same art magazine—the most recent one, and, therefore, presumably up to date. In the *Studio* for May 1893, you will find all the following passages:—"Complete mastery over materials is, after all, not everything; in fact, from the artistic point of view, work only begins then . . . unless the feeling is true, the work fails to interest us. Herein lies the whole question of artistic production."

Again, "The world is too big, too grand, too serious to be ruled by technique." So far the idealists.

Now hear the other side.

"This idea that genius is everything and execution nothing is screwed fast into the skull of every Englishman."

"How very strong is the desire for the ideal in this country, since not even ridicule can crush it. For in what other country would people have dared show their taste for art as the aesthetes have done here during the last few years? . . . But these aesthetes, of whom the undoubted head is Mr. Burne-Jones, have rendered great service to the art of their country. In the

search for their puerile puzzles they have, in making their way, endowed England with a decorating art." (Burne-Jones's puerile puzzles.) Again, "The more an artist relies upon the intelligent use of his pigment, to the exclusion of the literary interest, the more he will vex those who are unable to follow him."

Lastly, in order to see how this disdain of fine thought and beautiful intention in painting operates in actual work, I will turn to a letter which appears in the same number of the magazine, signed by a portrait of the writer.

He is in Spain, in a half-ruined ancient castle, occupied apparently by peasants, and writes as follows:—"While M. aired his Spanish with the last representative of the family, I made a sketch of the place, and as I was doing so a shepherd brought in a sheep. Tossing it backwards on a bottomless chair, he cut its throat, while a woman held a bowl to catch the blood, to the great delight of a child, who dabbled its hand in the warm fluid and crowed with glee. This would have made a picture; the tone and gloomy colour of the thing was mighty."

"This would have made a picture." In the Scuola de San Rocco, at Venice, the mightiest man that Venice ever bore, Tintoret, has painted the whole poem of suffering and sorrow and disease, in order to glorify by contrast and by conquest the heavenly art of healing: and to place an emphasis upon his message which shall make it knock upon the coldest heart and duldest mind, and force an entrance by shock and by horror, lest perchance the gate open not to natural gentleness and love, he has not shrunk back or stayed his hand from showing us a scene which well might challenge question; for foremost among those miseries who surround the pool of Siloam waiting for the descent of the healing angel, and for the moment monopolising the attention of Christ himself, is a group composed of a young woman, gloriously beautiful, but lying in the lap of an old hag whose expression of cold and distressed perplexity, rather than sympathy or love, proclaim her venal and contemptible, and who calls the attention of Christ to the sufferings of her charge, to which it is impossible to allude.

Why did Tintoret paint such a scene? Did he say to himself, "It will make a picture?"

I will tell you why he painted it, and if you know his work yourselves, its unvarying majesty and highmindedness, you will hardly call me to question. He painted it (and nothing but such motive would ever have induced him to paint it or tolerate it) with high moral and instructive purpose, to show, for instance, that the most degraded is not outside the love of God, that the most despairing is not to be despaired of; he painted it to bring hope back to the hopeless and shame back to the shameless, by showing that no depth to which we can sink can sink us below the notice and healing of Love, and that the eyes of the Divine Physician are turned towards us, and not from us, by the violence of our malady.

Whenever the great minds of the past have treated of such things, this is the temper in which they have done it. The greatest men of all have never turned towards the seamy side of our life, or the world's life, by a natural inclination and preference, and never present evil, suffering or disease to our view except with some strong didactic intention.

But it is not worth while to spend much time in warnings against ugliness. Very little of the arts which have been betrayed into the aberration of seeking it has stood the test of time, and in the main it is true that to name the great works is to name the beautiful ones. Still, it is as well to remind you that old forms of painting are being much challenged now; new forms are being started, and people are liable to be carried away by the new at any time as the only right thing, and afraid of being called "old-fashioned" and behind the age if they do not. There is a disposition to-day to regard the conquest of difficulty as the only thing worthy of men's admiration. It is true that, whenever a man has done a thing that was hard to do, he has done good to the world—set a good example. But the doing of a difficult thing is not the whole of art. It is difficult to win a race, to conquer in a prize-fight, to climb the Matterhorn, to construct the Channel Tunnel or to build the Forth Bridge. Why is not the Forth Bridge a work of architecture? It is the largest building in the world, and the greatest triumph over difficulty that the science of building has ever gained. Why is it not a work of art? Simply because it was built without a thought of beauty, and because it is not beautiful. Nor is a painting worthy of the name of art unless it fulfils these conditions.

But what, then, of Hogarth's works, for instance, or those of Teniers?

There is certainly no intention to be beautiful. Do I dare to say they are not art?

I must not in these days, amid such strong conflict of opinions, say anything so calculated to bring my words into contempt. There is a beauty in the actual craftsmanship and fineness of handling in these works that must make them respected—there is the conquest of great difficulty and the evidence of much self-discipline and severe training which

must make these things a useful and valuable lesson to humanity, and justify their claim to a place in the stream of our progress. But having said thus much, I will tell you plainly that, if it were possible to suppose that those men and others like them had it anywise in them to have spent such fine skill on objects in themselves gracious, then their spending them as they did was one of those countless instances of mistaken effort and misapplied power which through all the ages have at times filled the history of the world with waste and with regret; and I will also tell you this, that I believe if Phidias or Pericles could stand, say, before the *Marriage à la Mode*, they would turn away from it as a very strange thing to look upon and a thing full of wonder, but by no means the work of a man who was "in truth taught of the Muses."

I prefer, however, to consider by reference to more modern work the problems and questions that press upon us, so I will return to the sheep-slaughtering scene, which our Impressionist friend says "would have made a picture." I am sure he would have made a very clever picture of it; but let me point out to you two very important things; first, that the greatest leaders, even in that phase of art we are discussing, never give in their works any justification for that disregard of beauty in all else than technique which has been audaciously put forward by certain painters and critics. Who ever saw Whistler (who towers head and shoulders above the rest), who ever saw Corot indifferent to beauty of sentiment or of form? I would never be for supporting an argument by a mere appeal to great names, but until some man as great as these arises to paint the horrible and the base, we may well go on our way unshaken in our old-fashioned notions of art.

The other thing I had to say comes nearly home to you architects.

It is this, that it would have never become possible for our tourist in Spain to have uttered of the scene he described, "This would have made a picture," had it not been for the lamentable divorce between the sister arts which has left the cabinet picture to become the isolated and irresponsible thing that it has, and so to fall into the position of a work produced throughout with the fact constantly in the mind that it will have to make its first appeal, and the one on which its immediate success or failure depends; from the walls of a glaring gallery, where it must scramble and jostle for precedence in a spirit of most unworthy rivalry, and that its subsequent history must be to be made a mere movable, and thus sink into the position of a counter in the speculations of the market-rigging and conscienceless dealer. And I think it must be owing to this that many of our painters for years past have been tempted to seek after something that will startle rather than something that will charm. And the reason why I am "happy" to tell you of the decline of the cabinet picture is not my objection to cabinet pictures as such, but only to cabinet pictures as this spirit has at present made them. I said it was the divorce between the arts which has led to this, and I think if you consider you will find it true, for surely any man building his own house with that culture and refinement which would be implied by his being interested in its architecture would *ipso facto* be so far educated as to wish to have nothing there but what would be a permanent source of reasonable and dignified pleasure and strengthening and repose; but, alas! we live in other men's houses. We are always "moving," or contemplating moving, somewhere else, and really, with everything here to-day and gone to-morrow, we take our dose of pictures every spring in the public galleries, and do not pause to consider them as having any permanent place in our lives, do not look to them for beauty or for solace, if for a few moments they spur our jaded souls by curiosity, or horror, or excitement. It is for you to help us in these matters by taking a lively interest in the union of the arts in which lies all our future hope, and by showing us the possibility of surrounding ourselves with seemly and beautiful things generally, and thus make it impossible for the beautiful plant of art, which spreads abroad its branches and puts forth its leaves in splendid and varied crafts, to make its only failure in that which is the crown and flower of all, by painting, which so lamentably misses its mark.

In the commencement of my paper I used all my endeavour to get firmly fixed into your mind the idea of the painter's special craft—the technique which, to some painters of the present day, seems to be the one thing needful. I also declared my belief that it was needful, that no one without it could claim to be a great painter; but I have been in the latter part of my address to you dwelling on the value and dignity of those other elements of beauty which painting is so eminently well fitted to express, and to neglect which is to resign a portion of its crown; and you will find that painters, as a rule, have valued this skill (if they lived at a date at which it was possible for them to know of it) in proportion as they were seekers after beauty—Raphael more than Michel Angelo, Bellini more than Raphael. They "loved that beauty should go beautifully." So also they were the decorators, and if I name those who in these days come nearest to having that quality—Burne-Jones, Watts, Albert Moore, Leighton, Whistler—you see at once

that I name the very men amongst painters best fitted to associate themselves with your art in the capacity of decorators. For in truth they are the seekers after beauty. Others may wish to be historical or dramatic or pathetic or domestic or (God help us) comic in their painting; they are bent on being beautiful; they seek that first; all the rest may be "added unto it."

Forgive me for dwelling at such length upon this point, which should be one of the commonplaces of art; it is astonishing indeed that the utterance of such a rudimentary truth should be needed, but we cannot go through any gallery of modern pictures without seeing that it hardly enters into the popular mind of the present day that art has anything to do with beauty; far less that it has everything to do with it. I can hardly point this out more clearly than by reference to the collected works of two recently-deceased artists exhibited simultaneously a short time back. The one a popular favourite through the whole of his career, crowned almost at its commencement with full academic honours. The other almost universally ignored and neglected.

It is not necessary for me to recall the catalogues of these two exhibitions to your memory item by item; when I mention the names you cannot fail at once to recall the general impression that the first consisted of scenes of violence, conspiracy, personal combat, personal challenge, court intrigue and low comedy in trunk-hose, and that the latter was one harmonious procession of gracious form and colour; that one contained nothing that was markedly and intentionally beautiful, and the other nothing that was otherwise. Is it superfluous, then, in me to call attention to the most rudimentary definitions of the purpose of art in an age which so arranges itself that John Pettie should for twenty years have held a position in which it became his duty, from time to time, to give his voice in judgment upon the works of Albert Moore?

Nor can we console ourselves with the thought that it is only this particular nation and this particular age which has so erred.

It is a curious fact in the history of the human race that it is always liable to have the highest motives corrupted, and the most magnanimous temper spoiled by being confronted with actual achievement of any kind, in however undesirable a direction.

A nation penetrated and informed with the love of beauty, and doing everything beautifully for the sheer love of it, will turn its back upon itself in a moment and disdain its whole past, when accidentally brought into the presence of some new dexterity, even though exhibited in a field not worth cultivating. It will at once relinquish the pursuit of all that it was seeking, and despise all that it was producing to follow some skill, not one-tenth as fine as its own, but which challenges to a competition by its being new. It is hardly too much to say that the petty mechanisms and realisms of European work, aye, and third-rate Brummagem work at that, have in the last forty years destroyed the arts of the East. And I cannot resist concluding with an anecdote which has its humorous side and which brings out this truth into somewhat strong relief.

I was going through Italy some fifteen years ago, studying chiefly the art of the thirteenth and fourteenth century. I had with me as companions two younger men than myself, who were following with younger, but I think not stronger, enthusiasm the teaching of Ruskin. However, I was sufficiently older to manage my enthusiasms more cunningly, and the consequence was that I was always poking fun at the other two. However, one of them, a dear young Scotch architect, now, alas! no more, had all the caution and pawkins of his race, and would generally grasp the situation at once, and give me as good as I brought.

I had long recognised in the art of Giotto the intense struggle of the man, and how, with all his powers, he must have longed for powers beyond them to do the things he must have dimly imagined possible, but knew not how to set about. I had thought, and trembled to think, what might have been the result could he have been suddenly brought face to face with the clever realisms of modern art; and one day, standing before one of his frescoes, I turned to my companions and said, "Look here, you fellows, to put it shortly, if Giotto could have seen Frith's *Derby Day* he'd have gone into raptures." I forget what gesture of impatience my enthusiast friend made, but the Scotchman just leaned an inch towards me and replied as soberly, "P-r-robably have given it to Dante on his birthday." Well, gentlemen, I think we need not contemplate so exaggerated a catastrophe as that, for I think—upsetting as I am sure the experience would have been to Giotto—there is one thing that would have kept him right, his architectural sense; but for that I can easily imagine him so misled by the plausible dexterity of that celebrated work as to forget that it was not beautiful, but I think the union of the arts which was so happily embodied in him must have led him to distrust it at once because it was not decorative.

Do not imagine that all I mean by "decorative" is the art which is usually now alluded to under that name. All the

finest art is decorative; Veronese no less than Giotto, and what can be more reposeful and perfect and "liveable" than an eighteenth-century room, with the rich warmth of Reynolds and the serene grace of Gainsborough, amongst its slender mouldings and its dainty white and gold?

Don't, above all things, be narrow, or imagine that I want you to seek for art that is very flat, with a brown outline round the faces and with no shadows; but what I do urge you to seek for is art where beauty has been the aim before realism, glorious colour before deceptive light and shade, and graciousness and sweetness, and dignity and repose, before dramatic fervour, show, excitement and fuss.

It is the cultivation of this temper in you architects that forms the one hope of us painters who, disgusted with the frivolity and ugliness of the bulk of modern work, have been struggling along the despised and neglected path of decorative art.

Upon you falls the honourable (but responsible) task of directing the accessory arts, and it is with a real joy that we see so many of you now seriously setting yourselves to learn them. You will find in doing so, even if you learn but one of them, the grounds for a sympathy with your brothers in art, to which you have hitherto been strangers, and by virtue of which you will find them working with you rather than for you, with the enthusiasm and joy which ever comes with sympathy. And depend upon it, when masonry, when timber and glass and metal and mosaic and sculpture and painting are each advanced to their own proper perfection and completion, and when, being so, they are brought under the direction of a master builder whose knowledge of and sympathy with their various excellences has largely helped to make them what they are, we shall soon cease to hear complaints that we have "no style," for, if once the various crafts were used in perfection and used in association, they would soon form their own right style, and being used in sympathy also, the characters which would be stamped upon each one, by virtue of its own perfect craftsmanship, would combine to form one harmonious style for the whole range of the arts.

I have thus endeavoured to make clear to you what I consider the great essentials of painting as an art, and the essentials of its relation to architecture. The two questions are almost inseparable and quite interdependent.

The doing well of what we have to do, the perfect and right use of our tools and our stuff, is the simple ground on which these arts meet—they can't come together at all except by the humility and common-sense reasonableness of that first step; but this once taken they can, hand-in-hand, pursue their common aim, and that aim is beauty. And in the pursuit of beauty they gain strength from each other, for all their past history shows that they have ever sought it most successfully when they have sought it in common; and I venture to think that, speaking generally, their past history also shows that the arts have ever attained the highest perfection of all when, even beyond the attainment of physical beauty, they recognised yet another motive still and referred all their efforts to the standard of a high and noble conception of the whole of human life, domestic, civic, patriotic and religious, in its completeness and its dignity.

You builders of our temples and our halls and our homes, you students of our ancient glories, help us to recover that lost inheritance. When you apply to us to join with you in your efforts, do so in this spirit, and let us together apply whatever we can win back of the felicities and dexterities of our noble arts in portrayal of things worthy of them—the great verities of life and being; in the reiteration of the unchanging voice of human aspiration, the affections of the heart that never grow cold, the thoughts that never die.

A vote of thanks was carried by acclamation to Mr. Whall for his lecture, and the proceedings terminated.

THE ART OF CASTING BRONZE IN JAPAN.*

THE art of casting bronze has been practised by almost all nations from very early times. In Europe, at a remote period, long before the dawn of history, we have numerous examples of the skill of primitive man as a founder of bronze. Weapons of defence and implements of the chase are the chief specimens of his earliest work; but later, when other wants arose beyond the bare necessities for his existence, we find, together with these, objects for personal adornment and domestic or ceremonial uses.

In Asia, the earliest practice of the art is shrouded in the mists of extreme antiquity. Certain bronze figures from Chaldæa are attributed to a period not later than 2,000 B.C., and although of very archaic form and rude execution, indicate

that the casting of bronze must have been followed in that country, even for many centuries before that remote date.

In Japan the founder's art has a much less antiquity; it does not extend back to these periods; in fact no remains of any metal castings, even of weapons of defence, have been found there, approaching in age even those of the early bronze period in Europe.

The Japanese do not appear to have migrated to the islands they now occupy earlier than perhaps seven or eight centuries B.C., and the aborigines whom they found there were totally unacquainted with the use of metals. Hence all objects of metal which have been discovered are Japanese, and are not older than that time.

The evidence afforded by tumuli and dolmens and the remains found in them of the early history and civilisation of the Japanese, demonstrates clearly that in prehistoric times there were two periods, which are more or less clearly defined by the progress which they made in the art of metallurgy, viz. a bronze and an iron age. The bronze age begins with the immigration of the race, and terminates about the second century B.C. The iron age then commences and extends to the present time.

It is worthy of note here that the bronze age and the first period of the iron age are also characterised by two distinct forms of sepulchral monuments, the former by barrows or simple mounds of earth, and the latter by megalithic dolmens and highly-specialised forms of chambered tumuli. There is no evidence whatever of a copper age preceding that of bronze, but contemporaneous with the early iron age, and up to the sixth or seventh centuries A.D., we find copper in more extensive use than bronze. Iron swords, trappings and bits for horses, decorated with thin sheets of copper coated with gold, are found in abundance, whilst objects of bronze are rare.

The Bronze Age.

The castings which represent the early bronze age in Japan consist solely of swords and arrowheads, the wants of the people then being evidently few and simple, and although objects for personal adornment were in use they were made exclusively of steatite, jasper, quartz or other stones. The swords are found in barrows or merely buried in the ground, and never along with objects of iron; the arrowheads, on the other hand, occasionally occur also in dolmens, associated with iron swords, and thus connect the bronze with the iron age. These bronze swords are undoubtedly the most ancient castings in Japan. They are simple two-edged weapons, resembling in form the short sword of the ancient Greeks. In some examples the blade is cast in one piece with the hilt, but in others with a tang, to which a hilt was subsequently attached. The mould was of stone, and was made in two pieces. This is the oldest mould for casting bronze in existence in Japan. It was found by a Japanese archæologist in use by some farmers as a hone for sharpening their sickles.

I was unable to obtain any fragments or even scrapings of these swords for analysis as there are but few existing, and they are highly prized, but a fragment of an arrowhead which I examined consisted of copper and tin, and did not contain lead as an essential constituent, and the swords are probably of the same alloy.

Early Iron Age (from about Second Century B.C. to about Sixth Century A.D.).

In my explorations and studies of the remains which occur in the ancient Japanese dolmens and chambered tumuli, I have always observed a marked scarcity of castings of bronze. Circular mirrors, small bells and arrowheads occasionally are found, but they form an insignificant part of the contents of a dolmen, the chief objects being swords, arrow and spearheads, horse furniture and other articles of iron, many of which are plated with thin sheets of copper, coated generally with gold and sometimes with silver. The bells, which are of the form called by the Japanese "suzu," are simple hollow spheres with a slit cut in the lower half, and contain a loose piece of metal or a small round pebble to serve the purpose of a tongue. They rarely occur singly, but are usually cast in groups on the edges of a flat support furnished with a hole and tang for attachment probably to a staff, or in some cases to the trappings of a horse; they appear also to have been used as ornamental appendages to garments and the hilts of swords.

The largest castings of the early iron age are curious bell-shaped objects which are of special interest from their form and archaic ornament. It has been conjectured that they are temple bells, but they present no points of resemblance to these or to any instrument or object connected with the ceremonies or observances of Buddhism, and are, in fact, of earlier date than the introduction of that religion into the country. Moreover, none show any signs of having been hung. A considerable number have been found—always buried in the ground—chiefly in Yamato, Kawachi, Totomi and the neighbouring provinces.

As early as 669 A.D. the discovery of one is recorded, and

* A paper by Mr. W. Gowland, A.R.S.M., F.C.S., F.S.A., late of the Imperial Japanese Mint, read before the Applied Art Section of the Society of Arts on Tuesday, April 23, 1895.

this was even then regarded as being of such a great antiquity that it was presented to the Emperor. The designs with which they are ornamented—the simple geometric line patterns common to many primitive races—are also evidences of their great age. They vary in dimensions from 1 or 2 inches to 5½ feet in height, those measuring 1 foot 6 inches to 3 feet being most common, and all are of extreme thinness compared with their size. Their exact use is still a subject of dispute among archaeologists.

Seventh and Eighth Centuries.

Two events of marked importance in Japanese annals, on account of their influence on the development of the arts and culture, occurred during this period. Buddhism, which had been introduced about 552 A.D., had been adopted as the religion of the country through the energy and enthusiasm of Prince Shotoku Taishai (593-621 A.D.), and a fixed capital and court had, for the first time in Japanese history, been established at Nara (709 A.D.). These two centuries form a brilliant epoch in the history of the art of bronze-founding, as in that of the sister arts of painting and sculpture. Numerous temples, some on a scale of great magnificence, were erected for the services of the new religion, and the skill of both native and foreign workers in bronze was specially enlisted for their decoration, as well as for the production of statues of the divinities of Buddhism and of vessels for the ceremonies of its ritual.

Stimulated and supported by the priesthood in their efforts to produce objects worthy of the services of the church, the bronze-founders achieved results in those early times which have not since been surpassed. Unfortunately, many of their works have been destroyed by conflagrations and in the frequent spoliation of the temples during civil wars, but a few have been preserved which are masterpieces of the art of the modeller and founder.

Many tales record the enthusiasm with which the founders of the time were supported by their patrons, and of the stubborn manner in which, after many repeated failures, they overcame the difficulties which beset them. The Empress Hoken (749-58) herself is said to have aided the founders in stirring the molten metal for a statue of a Buddhist saint, which was only completed after six unsuccessful attempts. The development of bronze-founding, and the encouragement of its artists, during this period was entirely due to Buddhism, and even for many centuries later the chief works of the art founders were executed for the adornment of its shrines. The survival of most of the older bronzes is also solely due to the ease with which they have been preserved in temples and monasteries by the priests of that religion.

Japanese records and traditions relating to the works of art of this epoch, whether of the painter, sculptor, or founder, invariably speak of the help afforded in their production by Korean or Chinese artists, and not a few of the ancient examples which survive are even attributed solely to them.

It is very difficult to determine how far these traditions relating to Korean artists are trustworthy, as no traces of similar works have been found in Korea itself; yet they all present such a close agreement on the point that we are almost compelled to acknowledge that if not perhaps true in the details they give of individual artists, yet broadly speaking they may be based on facts; and that the Japanese owe to Koreans, or probably rather to Chinese who may have come through Korea, the first great advances which they made in the casting of bronze.

Besides the influence which the neighbouring countries—China and Korea—had on the technique and motives of the Japanese bronze-founder, we have also abundant evidence of the influence of the art of more distant regions. Amongst the treasures of the temple Horiuji (near Nara Yamato) are several Indian statues in bronze of Buddhist saints and deities, and a curious ewer, which are said to have been in the possession of the temple from the date of its erection in the early part of the seventh century. The characteristic pose of the figures, the modelling of their features and their jewelled headdresses, have been frequently copied, with more or less modification, and can be distinctly traced in many ancient Japanese statues, as well as in some of comparatively modern times.

During this epoch, especially that part of it which has been styled the "Nara period" (the seven reigns during which Nara was the capital, 709-84), the great development in bronze-founding was not the only advance made in the working of metals; but the art of incised *repoussé* work in gilt copper, which had been practised during the early iron age, was brought to a stage of perfection beyond which it has never passed.

From the Beginning of the Ninth to the End of the Twelfth Century.

Near the close of the preceding epoch the court was removed to the city of Kyoto, which from that time (794 A.D.) up to 1868 continued to be the imperial capital. This removal of the court was a severe blow to the art life of the ancient city, and the works and traditions of its old bronze-founders soon

appear to have been forgotten or neglected in the new metropolis.

From the beginning of the ninth until near the end of the twelfth century, a space of nearly 400 years, we have a period of stagnation, if not of decadence, in all art, yet, strange to say, it embraces the golden age of literature, during which the famous classical romances were written. Its first half, as shown by these romances, was marked by effeminacy; during its second the country was plunged in civil war. The romances give us but little information of the individual and art life of the people, and the pages of its histories are solely devoted to records of the jealousies and feuds of the great families of Fujiwara, Faira and Minamoto.

Until near its termination we have no record of the erection of any temple of note or of the execution of any great art work, and I have been unable to find any examples of the art of the bronze-founder during the entire period, excepting two insignificant boxes for holding seals (dated respectively 998 and 1098 A.D.), and nine distinct coinages of bronze money (from 810 to 958 A.D.). After this last date even the coinage of money appears to cease, and is not resumed until 1457 A.D.—500 years afterwards.

Thirteenth Century.

During the last years of the twelfth century, when peace was established throughout the country by the victories of Yoritomo, there are the first signs of a revival of the old art of the Nara period. From 1190 A.D. up to the date of his death (1198 A.D.) this remarkable warrior devoted all his energies to the cultivation and advancement of the arts of peace. Stimulated by his example and enthusiasm, the artistic spirit of the people was aroused from its dormant condition, and for nearly a hundred years we have a notable period of renaissance in art—a period chiefly remarkable in the history of bronze for the casting of that magnificent masterpiece, the colossal image of Amitabha, usually called the Daibutsu of Kamakura. This image, one of the finest examples of bronze-founding, cannot be adequately described by any word painting; it must be actually seen in the midst of its grove of conifers and evergreens to appreciate fully its grandeur and beauty, its soberness of design and noble expression of majesty and repose. It stands alone and incomparable among all the *chefs-d'œuvre* of Japanese bronze-founders.

Other bronze images of the divinities of the Buddhist hierarchy, of less colossal proportions and of varying degrees of excellence, were made for the temples of Yamato and Kyoto, one of the chief groups being a Trinity for the ancient monastery at Horiuji. Several bells were also cast, one at Kamakura being worthy of note, as the record given of it indicates the source of the metal from which they were occasionally made. It is said that 300,000 copper coins, which had been collected by the priests of the temple, were melted down for casting it, and the metal being insufficient, the casting was a failure; 30,000 more coins were then collected for addition to the defective bell when it was remelted. It is also recorded that copper coins were similarly melted up for casting Buddhist images and ornamental utensils, hence it would appear that it was not then deemed necessary to use a different alloy for bells and art castings than for coins.

Fourteenth and Fifteenth Centuries.

During the fourteenth and fifteenth centuries we have again a period of decadence, with the exception of two short brilliant intervals, the first during the supremacy of the Ashikaga Shogun, Yoshimitsu (1368-93 A.D.), and the second during that of Ashikaga Yoshimasa (1449-71 A.D.). For the greater part of this period the country was again in a state of unrest and intestine conflict, and the arts of peace found but little encouragement, excepting so far as they contributed to the needs of war.

Workers in iron are brilliantly represented by one of the greatest of the famous forgers of sword blades, Masamune, and by several distinguished armourers and smiths of the renowned Mio-chin family; but the bronze-founder was not in request. His chief work during these two centuries was a colossal figure of the Buddha Vairochanay, cast during the time of Yoshimasa for the temple at Hase (Kamakura). I have not seen this image, but it is said to be an admirable casting and to measure 30 feet 6 inches in height.

Sixteenth Century.

In the last decade of this century, after another period of civil war, the patron of art and culture is again a famous warrior, Hideyoshi (often known as Taiko Sama). Although then engaged in war with Korea, the closing years of his life were devoted to peaceful pursuits at home, and in imitation of Yoritomo at Kamakura, he erected a huge Buddha and a temple to contain it at Kyoto. On the destruction of the image, which was of wood, by an earthquake only eight years after its erection, he contemplated replacing it by one of bronze; but the execution of this was delayed by his death (A.D. 1598), and was only accomplished by his son and widow

sixteen years afterwards. No large bronzes of importance appear to have been cast during this century.

Seventeenth Century and First Half of the Eighteenth.

In 1603 Tokugawa Iyeyasu, a man of remarkable ability, both as a warrior and a statesman, succeeded to the Shogunate, and by his wisdom and foresight established on firm foundations the Japanese system of feudalism, which, under the rule of his successors, gave absolute peace to the country for more than two and a half centuries, and resulted in an advance and development of the arts unparalleled in any previous age.

During the supremacy of these Tokugawa Shoguns the painter, the lacquerer, the potter and the founder were encouraged and stimulated as they had never been before to bring their respective arts to the highest point of excellence, and it is in no small degree owing to the works which they produced during this period that Japan owes the prominent position which she now so deservedly occupies in the world of art.

The first great works of the bronze-founders of the seventeenth century were a colossal figure of the Buddhist divinity Rochana in Kyoto, to replace the wooden image destroyed by an earthquake in the previous century, and a huge bell for its temple.

The figure is said to have been 58½ feet high, and from the records regarding the first attempt to cast it, it would appear that it was cast *in situ* and in segments, the mould being built up on the parts already finished. It would thus, when completed, have been practically a single piece of metal. This attempt was a failure, as when casting the lower part of the head, the wooden scaffolding was set on fire by the operations, and the image partly melted. It was successfully completed in 1614, but only forty-eight years afterwards, like its wooden predecessor, it was destroyed by an earthquake. According to official records, its fragments were melted in 1668-83, and cast into the bronze coins (Kwan-ei-tsu-ho) then current.*

This record is interesting, as it affords another proof that the alloy used by bronze-founders did not differ much in composition, if at all, from that in use at the time in the mints for coins. I have analysed these coins with the following results:— Individual coins differed considerably from one another in composition, the percentage of copper present varying from 69.8 to 86.8, a variation not greater, however, than might be expected from the nature of the alloy and the mode in which it was cast. Hence, in order to ascertain their average composition, 7,600 pieces were melted together, and the resulting metal was analysed, and found to consist of—

	Per cent.
Copper	77.30
Tin	4.32
Lead	15.33
Arsenic	1.14
Antimony	0.31
Zinc	nil
Iron	1.01
Silver	0.06
Sulphur	0.52
Gold	trace
	99.99

We may hence not unreasonably conclude that this represents, approximately, the composition of the alloy which was used for casting the colossal Buddha.

The casting of a large bell in old times in Japan was an important event and was accompanied by religious ceremonies and popular rejoicings. On the day appointed for running the metal into the mould a grand festival was held at the temple, in the grounds of which the founding operations were performed, and people of all ranks came from far and near with contributions, many with offerings of mirrors, hair-pins and metal ornaments to be added to the bronze in the furnaces. On one occasion, that of the founding of the great bell of Zo-jo-ji, the Shogun himself (Iye-mitsu) was not only present, but took part in the direction of the operations. In succeeding years the day was not forgotten, but its anniversary was celebrated by temple feasts.

The fame and repute of this "golden" period in the bronze-founder's art does not however rest on the above castings, which are chiefly remarkable for their size and weight, but on those now to be described, many of which are masterpieces of design, modelling and technical skill.

The oldest of these are the bronzes cast for the mortuary chapels and tombs of the early Tokugawa Shoguns and members of their families. At the famous mausoleum at Nikko there are some grand examples, one of the most notable being the tomb of Iyeyasu (the first Tokugawa Shogun, died 1604 A.D.), a fine casting in bronze, with bronze gates, distinguished by impressive simplicity and chasteness of design. In front of

the tomb are the three ceremonial ornaments (Sangusoku) of the Buddhist altar, viz. a vase, incense-burner and candlestick, all of the severe style of the period. The gates are splendid examples of bronze-founding. Almost their whole surface is covered with delicate diaper and floral patterns, upon which ground the bolder ornamentation is moulded in relief. These consist of representations of the "chakra," or Buddhist wheel of the law, and floral designs, most of which are coated with gold. In front are the two fabulous animals (Koma-inu and Ama-inu) supposed to represent lions.

The tomb of Iyemitsu (third Tokugawa Shogun, died 1649 A.D.) closely resembles that of Iyeyasu in form, but the reliefs on its bronze gates are simply Sanscrit characters in medallions. These tombs are situated in a grove behind the chapels and oratory, and their simplicity presents a striking contrast to the magnificence of these edifices, which are the most richly decorated shrines in the world. It is said that their plain and simple design is intended as a concrete expression of the Buddhist aphorism that "at death there is an end to all magnificence."

Numerous large standard lanterns (toro) of bronze, contributed by the territorial nobles, who vied with one another in thus doing honour to their departed chiefs, line the courtyards of the shrines. Many hundreds of these "toro," which were favourite votive offerings of the wealthy both to Buddhist temples and Shinto shrines, were cast during this period of revival in bronze-founding. They adorn the approaches and grounds of every temple of note in the country, those of Zo-jo-ji (Tokyo) alone number more than 200.*

Each group or pair differs from any other, yet in outline and decoration all are in harmony; and if no other examples of bronze-founding were in existence, the gracefulness of form and fertility of design which characterises all would alone mark their modellers and founders as artists of the first rank. It will be noticed that both of these, although of the same general form, differ entirely in decoration.

The mausolea of other Tokugawa Shoguns also afford some fine examples of the bronze-founder's art, notably the tombs of Iye-tsana (1650-80), and Tsunayoshi (1681-1708), at Uyeno (Tokyo), and of Iye-nobu (1709-12), at Shiba (Tokyo). They are of similar form to those at Nikko, differing from them chiefly in the more elaborate decoration of their gates. Finely-modelled dragons, and the armorial badge of the Tokugawas, ornament the gates of Iye-nobu's tomb, whilst in the tomb of Tsunayoshi—who was a noted patron of art—there is still a further departure from the simple style of earlier times, the symbolical combinations of the fabulous unicorn (Hirin) and pine-tree, the phoenix (Hoo) and paulownia, and of the pine, bamboo and plum being perhaps almost too lavishly employed.

Another important bronze at Nikko representative of the period is a bronze column (1643 A.D.), termed So-rin-to, 42 feet in height, a form of the Indian "stupa," as introduced into Japan through China. Before removal to its present site it stood near the tomb of Iyeyasu, and was doubtless erected there in accordance with the Chinese superstitious beliefs in the efficacy of such structures in warding off evil influences and insuring the protection of heaven. Besides these, four huge lotus petals, for the base of the image of the Daibutsu at Kamakura, were cast at the beginning of the eighteenth century (1717).

From the Middle of the Eighteenth Century up to the Present Time.

Hitherto the skill of the bronze-founders had been chiefly exerted in the production of colossal images and other huge castings for the Temple of Buddha, and in giving a severe beauty to the forms and ornaments of utensils and implements for ceremonial purposes, but during this period, with the continuation of peace, their art found a wider range in the designing of objects for secular use for the decoration of the home and the everyday needs of life.

Shortly before, the okimono, or ornament, a thing of no practical utility, but only of display, had been introduced, and this specially opened up to the artist a rich and unlimited field for the exercise of his ingenuity and skill in the art of ornament and design. The vase, too, formerly used only as a ceremonial vessel of the Buddhist altar, now became a necessary object for the adornment of private life, and in its form and decoration the artist was no longer hampered by the old traditions and rules of the church. The founders of this period hence are not chiefly notable, as in earlier times, for the works destined for the services of Buddhism or the embellishment of its shrines, although many remarkable castings were made, principally standard lanterns, dedicated as votive offerings to temples and monasteries, and torii, or gateways of Shinto shrines, but owe their world-wide fame to the skill and fertility of design exhibited in the objects above mentioned for household use, many of which are masterpieces of form and ornament.

* There is another record of the conversion of Buddhist statues into coins in 1450-70.

* Presented to the Shoguns Iyetsugu (1716) and Iye-shige (1762) by the territorial nobility.

The period is also marked by an important naturalistic movement in the schools of both pictorial and glyptic art.

They had up to this time followed the older men in basing their designs on the traditions of Buddhism and the forms and motives of Chinese and occasionally of Indian art, but now they began to break away from the trammels by which they were bound to these old conventional forms and motives and go to nature for their inspirations and models.

It should, however, be remembered that much as the works, especially of Chinese artists, were admired, mere slavish copies were never or rarely made of them; thus in the bronzes even of the early days, the figures of Buddhist divinities, there is a serenity of expression and graceful arrangement of drapery which we look for in vain in the masterpieces of Chinese art. Nearly contemporaneous with the establishment of the Shijorui—the school of naturalistic painting—in Kyoto, by the famous painter Kyo, we find the art-founders adopting these new motives and new modes of representing the old. Stiff geometric designs give place to those based on natural forms, and even in representations of the mythical dragon we see, as has been pointed out by Professor Anderson, “distinct evidences of direct study of snake form.”

Studies of natural objects, of plant and animal life, were now made, the designs of the naturalistic painters were followed, and an impulse was given to the art of bronze-founding greater than had been known since the Nara period.

(To be continued.)

MANCHESTER SOCIETY OF ARCHITECTS.

AT the annual general meeting of the Manchester Society the following members were elected as officers and council for the coming session:—

President: John Holden. *Vice-Presidents:* John Ely, R. Knill-Freeman. *Hon. Secretary:* Paul Ogden. *Assistant Hon. Sec.:* Edward Hewitt. *Members of Council:* R. I. Bennett, A. H. Davies-Colley, T. Chadwick, R. Knill-Freeman, F. Mee, J. D. Mould, W. A. Royle, E. Salomons, J. H. Woodhouse, T. Worthington. *Members of Council-Associates:* J. S. Hodgson, H. E. Stelfox, P. S. Worthington. *Auditors:* J. W. Beaumont, C. H. Heathcote. *Education in Architecture Committee:* A. H. Davies-Colley, John Ely, F. Mee, J. D. Mould, G. H. Willoughby, J. H. Woodhouse, P. E. Barker, G. Brown, P. Hesketh, J. S. Hodgson, H. E. Stelfox, P. S. Worthington.

Mr. C. R. Locke, Mr. Joseph Nodal and Mr. Joseph Swarbrick were elected fellows, and Mr. C. B. Rochester and Mr. F. J. Almond were elected associates of the Society.

The annual report referred to two deaths among the members, the first being that of one of the best and trusted friends of the Society, Mr. James Murgatroyd, he having been one of the founders in 1865, and since that time one of its most energetic and valued members.

The late James Murgatroyd, architect and surveyor, of Manchester, a member of perhaps the oldest firm of architects in that district, was born in Ardwick, Manchester, on January 3, 1830, and was consequently within a few days of being sixty-five years of age at the time of his death. As a boy he was educated at the Chorlton High School, on leaving which he was sent to the Handel Schule, Leipzig, where he became a great favourite with the masters, particularly with the architectural master, as he at an early age developed that taste for the profession which he afterwards followed so successfully. After leaving Leipzig he returned home and commenced his business career. He at once obtained a seat in the office of Mr. Alexander W. Mills, who was then a rising architect in Manchester, and to whom his parents were known, and a very close intimacy then commenced between master and pupil, which continued without intermission up to the day of his death. At the termination of his articles he, by the advice of his friend and master, Mr. Mills, travelled for a couple of years on the Continent. On his return he contemplated commencing practice on his own account, but ultimately joined his old master, and in 1853 the firm, originally “Alexander W. Mills,” became “Mills & Murgatroyd,” the partnership thus commenced terminating in 1881.

The business, which was established by Mr. Mills in 1838, had already at the date of the partnership attained considerable importance; and amongst other works in hand at that time was the extension of the Exchange Building in Manchester, afterwards, by letters patent, the Royal Exchange, and in this work particularly he as a young man took a lively and active interest, as also in the subsequent works connected with the alteration and the reconstruction in or about the year 1860. Many important works were carried out by the firm, that very deservedly secured a considerable share of the work in and about Manchester. The joint station of the London and North-Western and the Manchester, Sheffield and Lincolnshire Railways at London Road was perhaps one of the most important buildings erected by it; also the extensive buildings belonging to the Poor Law Guardians of the township of Manchester.

The Manchester Grammar School, with its very complete gymnasium; the High School for Girls, and the large building erected originally for a warehouse, and now known as the Grand Hotel; the Manchester and County Bank, and most of its branches in the surrounding towns, were also erected by the firm. Personally, the two partners seemed made for each other; at no time during their business relations was there any difference between them, and the partnership was terminated in 1881 simply by the elder, as it were, putting on his hat and leaving the office to the young partner—a very rare occurrence, but one particularly showing the strong affection and confidence which existed between the partners.

Murgatroyd's continental education and travels gave him considerable advantages, as he could converse fluently in German and French, and almost as well in Italian. His knowledge of mathematics was considerable. He was always greatly interested in educational matters connected with the profession, and was for many years actively engaged in the management of the school of art and the technical schools, and was one of the committee appointed by the Corporation to visit the Continent for the purpose of collecting information preparatory to arranging for the building of the extensive technical schools which will shortly be commenced in Manchester.

For many years past Murgatroyd was largely engaged in valuing properties, more particularly in connection with the city improvements. He acted as umpire or arbitrator in a considerable number of disputed cases, in which his clearness of judgment was invaluable. He was a Fellow of the Institute, having been elected in 1877, and one of the founders in 1865 of the Manchester Society of Architects, of which body he was twice President, and he may be said to have been one of its mainstays. His circle of business friends was very large. He was well known for his strict integrity, and was trusted by every one with whom he came in contact.

The Society also regrets the death of Mr. Laurence Booth. Owing to failing health for the past year or two he had not been able to attend the meetings regularly, nor had he been able to devote himself so earnestly to the work of the reconstructed Society as he did to the work of the Manchester Architectural Association, now happily merged in the present Society. For two years he was the President of the late Architectural Association, and many will remember with feelings of gratitude the good work he did in promoting the interests of the members, and especially the junior members, during his occupancy of that presidential chair.

GENERAL.

The Eden Theatre, Paris, is being demolished, with some adjoining houses. The ground will be laid out for building sites in connection with a new street which is about to be formed.

The Congress of the Société Française d'Archéologie will be held at Clermont-Ferrand from the 5th to the 13th June. There will be several excursions to places of interest.

An Exhibition of works by Corot, the French painter, will be opened in Paris, probably in the Musée Galliera, in June. The memorial of the artist to be erected in the Parc Monceau will be inaugurated in July 1896.

M. Charles Garnier has completed his article “Façade” for the Dictionary of the Académie des Beaux-Arts.

Mr. C. J. Phipps, F.S.A., is preparing plans for the conversion of the Queen's Hall, Reading, into a theatre, which will be arranged for about 1,700 seats.

A Memorial Cross of a Celtic type, about 12 feet high, has been executed in Scotland, and sent to Chicago for erection at the grave of the late John W. Root, the architect.

Wednesday, May 8, has been appointed for the reception of works of art intended for the Summer Exhibition (the thirty-fourth) of the Nineteenth Century Art Society, at the Conduit Street Galleries.

A Marquis of Argyle Memorial is to be erected in St. Giles's Cathedral, Edinburgh. The cost will be over 1,000l., Messrs. Mitchell & Wilson being the architects.

Mr. Charles Mason, surveyor to the Vestry of St. Martin-in-the-Fields, will read a paper on “Street Subways for Large Towns” at the meeting of the Society of Engineers on Monday, the 6th inst.

An Anonymous Benefactor has presented to the Liverpool Corporation over a hundred acres of land in the Wavertree district, for a public recreation-ground.

The Berlin Art Exhibition has been formally opened by Dr. Brose, Minister of Public Instruction.

An Art Union is to be established in connection with the Earls Court Exhibition. It is proposed to expend 15 per cent. of the amount paid for season tickets in the purchase of works of art. The lottery will be confined to holders of season tickets.

The Architect.

THE WEEK.

SIR JOHN MILLAIS was true to himself in officiating as chairman at the Academy banquet. He has devoted his life to his art, and it was more worthy of so long and successful a career to refrain from the slightest display of versatility. In his little speeches, as in his pictures, he endeavoured to be faithful to facts. His manner of persuading the guests to accept the toasts was by explaining his own associations with them. He related how the Prince of WALES at his suggestion took the chair at the first dinner of the Artists' Orphan Fund, and in consequence the large sum of 16,000*l.* was obtained. The Duke of EDINBURGH the next year, on Sir JOHN'S appeal, became chairman, and the fund gained 6,000*l.* "The Army, Navy and Reserve Forces" brought up the reminiscence that the adoption of a grey uniform for the Artists' Corps was discussed in Sir JOHN'S studio in Langham Place. "Her Majesty's Ministers" recalled the fact that the chairman had painted portraits of most of the illustrious statesmen of his time, and "Music and the Drama" that he had composers and actors among his sitters. In the response for the Academy Sir JOHN naturally dwelt upon his connection with it since his eleventh year, when he entered as a probationer, and warmly declared that he loved everything belonging to it, the casts he had copied, the books he consulted, the very benches he sat on. All this egotism was honourable. It was the simplest expression of the feelings of a man who found himself in a difficult position. An inferior artist would have tried to look at the topics abstractedly, and imagine he was likely to become eloquent by that arrangement. Sir JOHN MILLAIS was more wise when he described those views which had become most familiar to him. It is only to be regretted that personal recollections cannot be repeated should another occasion arise.

THE decision which was given by Mr. Justice VAUGHAN WILLIAMS on the 3rd inst. in the action HERRING v. Trustee of Marriage is of great importance to quantity surveyors. The point was how far the payment of surveyors' fees was affected by the bankruptcy of a builder. His lordship did not attach much importance as to whether the quantities were part of the contract or not in the event of the builder becoming bankrupt, and held that the quantity surveyor must take a dividend in spite of the facts that the architect had instructed the builder to pay the fees only upon the order of the architect, and that there was a clause in the contract that "All amounts for special purposes were to be provisional, whether so specially mentioned or not, and were to be deducted in whole or part, if not required," and that the architect had given separate certificates for the amounts due to the contractor and for the quantity surveyor. The effect of the decision will be to place quantity surveyors in the same category as ordinary traders. The former are not able to provide for contingencies of failure, while part of a trader's business is to make provision of that kind. The case deserves more attention, and the Surveyors' Institute, that ought to give more attention to subjects that are not connected with estate management, should take steps for that purpose. Unless we are mistaken, the decision will make others suffer besides quantity surveyors.

THE Technical Instruction Committee of the Borough of Crewe invited the following architects to send in competition designs for their new buildings, viz., Messrs. J. W. BEAUMONT, G. E. BOLSHAW, CHAPMAN & SNAPE, FORD & SLATER, J. LANE FOX, J. D. MOULD, JAMES STEVENS, WOODHOUSE & POTTS, and WOODHOUSE & WILLOUGHBY. Messrs. W. SUGDEN & SON, Leek, were appointed assessors. They placed first the design numbered 7, and this decision has been accepted by the committee. When the sealed envelopes were opened the author was found to be JAMES STEVENS, F.R.I.B.A., 88 Morley Street, Manchester.

THE following resolution was adopted at the meeting of the Association of School Boards in the Westminster Town Hall, on Wednesday:—"That in view of the difficulty in obtaining suitable sites for School Boards' buildings, consequent upon the present unsatisfactory state of the law regarding the compulsory purchase of land by School Boards, which frequently results in exorbitant prices having to be paid for eligible sites, this association is of opinion that the powers of educational authorities should be assimilated to those recently conferred upon parish and district councils by the Local Government Act, 1894, whereby land may be acquired for public purposes without additional allowance being made to the owners on account of the purchase being compulsory." The executive committee of the association will enter into communication with the Government on the subject.

THE annual meeting of the Liverpool Architectural Society was held on Monday. Mr. HENRY HARTLEY presided. According to the report of the Council there are 129 members, being one less than last year. The receipts amounted to 110*l.* 15*s.*, which sum was sufficient to defray expenses and to leave a balance of about 7*l.* There was an expression of regret in the report about the absence of students from the new School of Architecture, which was founded mainly through the influence of the Society. The following officers were elected:—Mr. A. CULSHAW, president; Messrs. H. W. KEEF and J. WOOLFALL, vice-presidents; Mr. J. W. BLAKEY, librarian; Mr. JAMES DOD, treasurer; and Mr. HENRY L. BECKWITH, secretary. In his retiring address Mr. HARTLEY said the most important event which had taken place during his period of office had been the establishing of a School of Architecture and Applied Arts, and the appointment of Professor SIMPSON to the chair of architecture of the University College. He congratulated the Society upon the fact that Liverpool was the first centre which had taken upon itself to establish such an educational work. He also congratulated the profession generally upon the accomplishment of a scheme which had been so long desired and so long looked forward to, namely, the formation of such a school as a great centre from which would spring new life and vigour in the development of art.

THE forms of contract for new buildings, enlargements and alterations, ordered by the London School Board, are to be altered in order to give more definiteness to the clauses relating to the payment of the London scale of wages to the workmen. A schedule fixing the rate per hour is to be appended to the contracts. For every breach of the condition about paying the prescribed rate, the contractor on demand is to pay as liquidated damages and not as a penalty the sum of 5*l.* The following conditions will also have to be observed:—"The contractor shall, during the continuance of this contract, display and keep displayed upon the site of the works, and in every factory, workshop, or place occupied or used by the contractor in or about the execution of this contract, in a position in which the same may be easily read by all workmen employed by the contractor in or about the execution of this contract, a clearly printed or written copy of the said schedule hereto, and for each and every breach by the contractor of this condition, and notwithstanding the condonation of any prior or other breach, the contractor shall on demand pay to the Board as liquidated damages and not as a penalty the sum of 1*l.* for every day during which such breach shall be or continue." The contractor shall, to the satisfaction of the Board, provide and keep proper books, in which shall be correctly and promptly entered from time to time the names of all such workmen as aforesaid and the wages paid to such workmen respectively, and shall from time to time when required produce such books to any person or persons appointed by the Board or by any committee of the Board, to whom the matter or business out of which this contract arises may have been or may be referred to inspect the same, and allow such person or persons to take copies of or extracts from such books or any of them, and for each and every breach by the contractor of this condition, and notwithstanding the condonation of any other or prior breach, the contractor shall on demand pay to the Board as liquidated damages and not as a penalty the sum of 3*l.*"

ARCHITECTURE AT THE ROYAL ACADEMY—II.

WHEN arranging the drawings in the Architectural Room care was taken to place the two studies for the church of St. Andrew, Boscombe, opposite the doorway. From their size, colour and novelty they are better adapted than any of the other drawings to excite the curiosity of people who pass through the adjoining room. They suggest a building that is mysterious, and a visitor may be tempted to enter the Architectural Room in order to discover their meaning. It would be an advantage if such colour effects could be produced in available building materials, but so long as finance rules architecture, we fear the real St. Andrew's will be less like the visionary structure presented on paper than most buildings. Surveyors would be puzzled to describe the materials that are depicted, but we are sure Mr. A. GOODWIN would consider the design to be admirable. We may now follow the order of the catalogue.

The New Chapel, Cheltenham College, is a Perpendicular structure, but with a less amount of window space than would be desirable in the majority of churches. Youthful eyes can, however, follow their prayer-books with a dim religious light. An interior view, looking towards the west end, of St. Swithin's Church, Lewisham, is contributed by Mr. E. NEWTON. Flat arches are used under the gallery, and there is a general absence of severe treatment which is gratifying. The reredos for Manchester Cathedral, by Mr. B. CHAMPNEYS, is one of the richest of its class. Colour has been used for statuary as well as paintings, and it will be worth turning into the cathedral to see so much splendour. No less desirable would be the addition of the west front to the cathedral, as proposed by Mr. CHAMPNEYS. In the design for a rood for All Hallows, Southwark, Mr. H. WILSON exalts the figure of CHRIST about the attendant saints. There are designs for some organ-cases hung in the part of the room we are describing. Sir A. W. BLOMFIELD and Mr. BODLEY have introduced more variety than is usual in the size of the pipes of the cases for St. Saviour's, Southwark, and St. Paul's, Burton, respectively. In both there is a delicacy of ornamentation which is also not common. The two views of St. Saviour's Priory Chapel, Haggerstone, by Mr. C. H. M. MILEHAM, will appear novel in a district which has much variety already in its church buildings. The view of the exterior recalls a street in some quiet Italian town. The interior is more definitely Romanesque, and in its green marble is largely used. There are also marble panels, and colour is seen throughout. In his chapel and screen at St. Alban's, Holborn, Mr. MILEHAM has produced a reposeful work. The New Chapel, Radley College, by Mr. T. G. JACKSON, shows the chancel with the organ and seats, which are elaborately carved. It is well fitted for collegiate use. Another of the architect's drawings is the screen in St. David's Cathedral. The design for the Wesleyan Chapel, Blaina, Mon., by Mr. W. L. GRIFFITHS, is interesting as evidence of a desire to avoid the characterless forms which for so long have prevailed in that region. The building is not large, but it is pleasing, and all the parts, especially the little tower, show a finesse in the treatment which is not met with every day.

The designs by Mr. A. H. SKIPWORTH should not be overlooked in the most cursory view of the collection. The first met with is a design for an organ in St. Alban's, Teddington, and excellent effect is obtained by introducing a band of angels around the gallery. Two drawings represent "a nineteenth-century attempt at a large cathedral;" there are also the church of St. Etheldreda, Fulham, and a design for a church for Abbeyvale. All these have a similar character. Mr. SKIPWORTH believes that the Gothic of the future must be severe, if not stern, in style. The old endeavour to suggest that some fairy's hand had changed willow wreaths to stone does not approve itself to him. Treatment like Mr. SKIPWORTH's and Mr. WILSON's seems, however, to be better adapted for buildings on a grand scale, and they are not in demand in our time. Mr. WALTERS has a quiet church at Petworth. A florid throne for Colombo Cathedral is shown by Mr. TAPPER, an odd sort of means to convert the Cingalese. The Congregational Church, Belfast, by Mr. H. F. T. COOPER is small but effective, without any sacrifice of economy.

The design sent in by Messrs. PALEY, AUSTIN & PALEY for the proposed Christ's Hospital Schools, Horsham, is shown on three drawings, but many will consider the chapel as the most successful portion. The interior is finely proportioned, and the chancel would be impressive. The same architects have a view of the rebuilding of All Saints, Hertford, which is a large building with tower handled in masterly style. All Saints, Swanscombe, by Mr. NORMAN SHAW, is admirable throughout. It suggests a building that would last for centuries by its sturdy character and massive buttresses. The low tower imparts distinction to the church. Credit is deserved by Mr. A. YOUNG for producing so picturesque a group as his Church of Our Lady and St. Thomas of Canterbury at Harrow, which is cheap without being vulgar. A building of this kind is preferable to the pretentious attempts which are alike unsatisfactory whether incomplete or completed. The chapel of the Hospital of St. Peter Port, by Messrs. CARVILL & PASSMORE, we trust will look less melancholy when erected than it does on paper. It is strange how strong is the prejudice in favour of the curative effects of dreariness in hospital buildings. The chancel end of All Souls' Church, Peterborough, by Mr. STOKES, is presented; so it may be assumed the greater part of the building is very plain. Mr. W. F. BRIGHT has a very dark church. The reredos in the Catholic Apostolic Church, Gordon Square, by Mr. BELCHER, is Gothic, but a much later character is imparted to the altar-rails, which are of a Georgian type with fine flowing lines. The chancel and alterations to the nave of Christ Church, Southwark, by Mr. BAKER KING, are in late Italian, and give a Romanised appearance to the building. Mr. HORSLEY's chancel at Ipstones, Staffordshire, forms, as it were, three sides of a polygon on plan. In the exterior view sculpture is introduced above the window. There is a graceful spire for Emmanuel Church, Plymouth, by Messrs. ROGERS, BONE & COLES. Another by Mr. C. A. NICHOLSON is intended for a church at Cockington. St. Michael and All Saints, Colehill, by Mr. CAROE, is shown in an interior, and is a good example of the modern village church, in which unnecessary height is avoided. The church of Our Most Holy Redeemer, Chelsea, expresses loyalty to Rome by the modernity of the Renaissance employed, and as it is reactionary it becomes more remarkable in being the work of an architect who was hitherto so loyal to Gothic—Mr. E. GOLDIE. But the grandiose character can only be realised by a large outlay, and it has yet to be shown that churches of that kind when they have to remain incomplete are as satisfactory as those in earlier styles. Mr. GOLDIE, in his church for Slough, has returned to Gothic. Mr. E. P. WARREN's church for a West London suburb is a thoughtful study. The buttresses are within the building, and are utilised, as open arches are formed through them. Mr. WEATHERLEY utilises sculpture as well as painting in his Stanford-on-Soar Church. The Lady Leng Memorial Chapel, by Mr. CAPPON, occupies apparently a limited site, and the building, which is Gothic in style, is treated simply and in good taste. In Mr. INIGO THOMAS's Church House and Garden the last is made to appear the more important, and it ought to receive the consideration due to an attempted revival of an art which should be still controlled by architects. There is an abundance of designs for stained glass to be employed in churches, but they all come from manufacturers.

There is only one school this year. The examples which are set up in London have their influence elsewhere, and that is not advantageous for architecture. The Grange Road Schools, Middlesbrough, by Mr. BOTTOMLEY, suggest that in one provincial town at least it is not supposed to be advantageous to suggest a relation between schools and workhouses and other asylums for the poor. Terra-cotta is introduced for the sake of effect, and altogether the buildings are made to be attractive to children. That only one school should be worthy of admission is a revelation of what the combined operations of the Education Department and the School Boards are turning building into. There are educational buildings of other kinds. Mr. M. B. ADAMS's Passmore Edwards Free Library, Hammer-smith, is well adapted for the purpose. It is secular in character, has ample light, is roomy and does not compel visitors to climb an inconvenient staircase to gain effect. Yet although its appearance is pleasing and adapted to its

purposes, it does not look like a costly building. The Lecture Hall, Imperial Institute, seems from the exterior to be a small building, but it is more massive and severe in style than the principal block. Two designs for the Hampstead Library are in the room. Mr. H. FIELD'S shows the rooms on the ground floor, while in Mr. A. S. TAYLOR'S there are several storeys. The design for Sutton Technical Schools and Baths, by Mr. SEARLES WOOD, presents a group of very simple buildings. The Bishopsgate Institute, by Mr. C. H. TOWNSEND, is a suggestive example of what can be done with a restricted frontage. The ornament on the spandrels of the archway is most effective from its vigour and the strength which comes from such a length of stem in an unbroken line. The New Tabernacle, Woolwich, by Mr. W. H. WOODROFFE, seems to be a mean between a London board school and a Salvation Army barrack. As there is no plan the purpose of the building cannot be guessed. The design by MESSRS. ASTON WEBB & INGRESS BELL for the new Christ's Hospital is represented by one of Mr. PRENTICE'S drawings, and it is to be hoped so important a project will not be much longer left in abeyance. The site may not be adaptable without the expense of more money than was anticipated, but there is no doubt it can be made innocuous beyond all cavil. In that way there was defective foresight, but on the other hand the dairy farm was suitable for the display of a series of groups of buildings. In the drawing there is nothing fanciful about site or surroundings.

Municipal buildings are scarce. There is a design for a modest group of public offices at Sutton, by Mr. SEARLES WOOD. The accepted design for the Rotherhithe Town Hall, by Messrs. MURRAY and FOSTER, has the advantage of large windows, and the tower is well combined with the main building. Mr. F. H. TULLOCH takes advantage of the local characteristic of chequering in his design for the Municipal Buildings, King's Lynn. The suggested Town Hall for Baldock, Herts, by Mr. W. C. JONES, does not err from too much simplicity, and it is necessary to propose to turn the lower part into shops. A design in Italian style, by Mr. T. B. SILCOCK, for the Llandudno Municipal Buildings, was selected. In the Quingentenary Memorial Building for Winchester College, Mr. CHAMPNEYS has employed rustication to a larger extent than is seen in the other drawings. The School of Art Needlework, by Mr. FAIRFAX WADE, is refined in treatment, and is adapted for its position at South Kensington. Mr. BRYDON'S Pump-room Buildings, Bath, will be in keeping with many of the buildings in that city in which vigour is subdued. The Staffordshire Infirmary, as remodelled by Mr. ASTON WEBB, with its long narrow windows and symmetrical arrangement, is not so showy as some other late examples. The absence of steps to the principal entrance will be a boon to sufferers. The design for the Municipal Buildings, Darlington, by Messrs. CLARK & MOSCROP, is one of the most successful of the works of its class which have been seen at Burlington House. The Perth Public Library, by Mr. A. G. HEITON, is suited to the circumstances of a town that is not wealthy and in which money would be spent more willingly on literature than on ornament.

The offices of the Prudential Assurance Company are to be found in most of the principal towns, and they have the advantage in a business sense of being readily recognised by their style. The new Edinburgh office is equal to the best of its predecessors. It is not possible to have a definite type for all insurance offices, but Mr. WATERHOUSE in his buildings of the kind and in his banks makes it plain they are not residences. As usual red brick and terra-cotta are used, and the number of mouldings in pieces of the latter give emphasis as well as variety to the façades. In the first premiated design for the new bank, Halifax, Messrs. HORSFALL & WILLIAMS employ long pilasters in a way that was supposed to be obsolete. There may be local reasons for the arrangement.

There are several drawings of old work by Messrs. HORSLEY, NEEDHAM WILSON, MALLOWS, CORLETTE, MITCHELL, R. BARRATT, PHENÉ SPIERS, HART, ROBINSON and F. W. BEDFORD.

A couple of models in cardboard are to be seen in the Architectural Room, and that mode of representation is worth more encouragement. The visitors to the room are

so few it cannot be said that stands and models would cause an inconvenience, for there is nothing to be obstructed. The occasional visitors to the refuge prefer to glance at the drawings while lounging on the sofa.

PAINTING AT THE ROYAL ACADEMY.

AN architect who might be speculating about the decoration of a building will not find many works to aid him in this year's exhibition. Nor will lovers of historical subjects be able to discover much to gratify them. It is not a year for grandiose subjects, and there is no work which will be generally accepted as "the picture of the year." The exhibition, however, deserves to be popular. In every room there are pictures which should afford pleasure to all except those amateurs whose imaginations are so creative they can stand before the noblest work and ask "Is this all?" In fact we cannot recall an Academy exhibition in which the average standard was higher. The hanging also is equitable. There are freaks of juxtaposition which are evidence of the existence of a humourist among the committeemen, but there are fewer excellent works near the ceiling than are usually seen. As a consequence the visitor will find that only a small percentage of the works can be skipped. A criticism on the exhibition should therefore be comprehensive. But as usually happens critical and uncritical visitors are compelled to submit to limitations, and for our part we must restrict ourselves to works which cannot be passed over without injustice.

In the first room, *The Little Mother*, by Mr. S. H. HENSHALL—a child in a blue cotton dress with white spots, holding an oppressive baby of the Tetterby species wrapped in a blanket—would be taken in the Salon for a French work, owing to the skill with which effect is gained by blue, yellow, and white. Mr. GOTCH likes to employ flowers as adjuncts to his figures, and his *Death the Bride*—a woman in a black transparent veil—stands amidst poppies that are capably rendered. The *Icarus* of Mr. PEPYS COCKERELL is the best work he has produced. The primitive inventor lies crushed on the sand near the sea, and the great wings which were so gaily bound with yellow ribbon are broken. The pathos of the scene is deepened by the restraint which the artist imposed on himself. Another case of a tragedy depicted by means of a single figure is *St. Stephen*, by Sir J. E. MILLAIS. He has departed from precedents. The proto-martyr wears no rich chasuble; he is simply clad, and lies on the ground amidst trees which allow a glimpse to be seen of the sky, with its stars. All is repose, and the simplicity suggested by the character of the figure appears to have attained its fitting termination. Mr. ARTHUR LEMON'S *Centaur* is a new version of an old theme. Mr. W. B. RICHMOND'S *Countess of Pembroke* is in a manner which may be a sign of transition or may be the result of devotion to mosaic. The head and gown might be painted by two men. The satin is broadly treated; the face somehow recalls the peculiar handling which Mr. BRETT follows with pinkish rocks. In another room the *Aphrodite*, *Eros*, and *Himeros* display the same sort of flesh painting. It may lead to excellent execution, but at present it can hardly be approved. Mr. LEADER'S *Evening*—a vicarage and church—is as characteristically English a scene as any of the painter's works, and he was never more successful in suggesting the light and quietude of the close of day. Mr. DICKSEE'S *Reverie* is another example of the difficulty he finds in expressing things simply. The relationship between the mortals and the ghost is not apparent, and if the nocturnal visitor were painted out the picture would not suffer. The artist was not content, we suppose, with a display of artificial light which REMBRANDT would never attempt; he must also have a hazy being subjected to its influence. It is a pity Mr. DICKSEE does not believe with the Greeks that a half is sometimes more than a whole. Several years ago we expressed surprise that Mr. CLAUSEN was not sought out as a portraitist. His *Mrs. Herbert Roberts* is a success because it is characteristic of his style. It is only necessary to look at the eyes to be assured of that fact. It is not every fair lady who would care to be painted with so little display, and such indifference to the means for securing admiration for figure and millinery. A style

of the kind is not for showy women, and Mr. CLAUSEN will never be a fashionable portraitist; but for those who prefer mind to raiment it should have value.

The second room contains a *Palazzo Ca d'Oro*, by Miss STANLEY, which will bear comparison with any of Miss MONTALBA's versions. Mr. SEYMOUR LUCAS's *Waiting for the Duc de Guise* is such an interpretation as would occur to most painters, but the execution is masterly. Mr. LESLIE's *November Sunshine*, a bit of the Thames crossed by a bridge, must extort admiration from landscapists. Mr. GEORGE CLAUSEN employs more colour than usual in his *Harvest*, for the harvesters are illumined by the setting sun, but he compensates for the novelty by *The Farmer's Boy*, which is almost a monochrome. Mr. WATERHOUSE's *St. Cecilia* will look far better when time has operated on it. Some of the colouring is very crude; with such lips as are painted it was necessary to exceed throughout.

Sir J. E. MILLAIS has a worthy companion to the *St. Stephen* in his *A Disciple* in the third room. Mr. F. DICKSEE, in his *Paolo and Francesca*, adheres to precedent in making a woe-begone pair of lovers. The pictures by Sir F. LEIGHTON in the room show no indication of failing powers. *Lachrymæ* is subdued in colour, but *Flaming Fune* subdues all the pictures around it. The latter is, as it were, a modern version of a Sistine sibyl. The figure reposes in a way that would hardly be comfortable, although very agreeable for a spectator. The orange robe is in its way as daring as the scarlet coat of the "beefeater" which amazed MEISSONIER and other French artists. The details of the girl's figure are finished with exceptional care, and altogether the picture is one which should become public property. In his *Glen Orchy* Mr. HENRY MOORE has painted sea water that is not a pellucid blue, and, still more extraordinary, the sea forms only a small part of the picture, and is subservient to the wild Scottish landscape. Mr. CALDERON, in his *Ariadne*, represents MINOS' fair daughter as having ventured into the sea after the perjured THESEUS. It is a novel interpretation, but the figure has to be made small in consequence. Mr. HOOK is still in his prime as a painter. His *Seely Sheepe* and *A Harvest in the West Country* are as characteristic as any of his pictures painted twenty years ago. Sir J. E. MILLAIS is not content with early Christian confessions; in *Speak! Speak!* he is ambitious also to represent the phantasmal. An artist in his position should respect the limits of his art, and, we must say, not much is gained by what has been attempted. It is impossible to determine whether the bejewelled lady who pulls aside the curtains of the bed in which the man is seated retains any human feelings. Apparently, like BANQUO, she has no speculation in the eyes with which she gazes, for her face is as inanimate as a mask. We may allow that the painter has produced a pictorial riddle, but in these days surely art might find some worthier occupation. We prefer visions like Mr. ALMA TADEMA's *Spring*, for in it imagination has been well exercised in recreating a beautiful scene. All the girls who carry baskets of flowers, as well as those who sing or play on musical instruments, may be as remote from reality as any ghosts. The Ionic columns, the arches, steps, and benches, may also be unlike the work of Roman masons. But if the whole procession is untrue, it compels us to conclude that it ought to have been witnessed in Rome, while nobody can have any interest in ghosts or their performances. Art fails when it attempts to excite terror, and Sir J. E. MILLAIS has confirmed the old experience. We hope he will not waste his genius upon exercises that are doomed to be futile.

It is to be hoped the production of puzzles will not be contagious, for it is astonishing how few of them will suffice. The visitor who goes systematically through the galleries will discover that if he has escaped a stony face in No. 3, another awaits him in No. 4. Mr. YEAMES is not the kind of man who would be suspected to produce such a picture as *Defendant and Counsel*. The stoutest litigant would quail if three junior counsel were set on him at once without the modifying influence of a Q.C., and it is no wonder if any young lady, who is as handsome as is represented, should come near the loss of reason. Her paid advisers are, however, without pity. But there may be another or a hundred interpretations of the picture. Whatever is the nature of the transaction, the figures are

put on canvas with astonishing realism, and it is to be regretted that so much power was not applied to a more satisfactory subject. Mr. HORSLEY's *Theological Students* would be excellent if the young English parson with his bride and his Baedeker could be eliminated. Tourists of that kind often are ridiculous, but here one of them appears to be inferior to his Mohammedan brethren. Mr. J. W. GODWARD's *Priestess* might be intended as a pendant for Mr. PRINSEP's *Golden Door*, which appeared a few years ago. Some of JOHN MARTIN's spirit must have entered into Mr. A. GOODWIN. His *Christians leaving the City of Destruction* is as imaginative as any of the earlier painter's palaces in Babylon or Pandemonium. In these days when architecture is succumbing to engineering, and building has become akin to the iron bridge and the iron ship, it is refreshing to see any sign of a belief that the art can be made subservient to the utmost efforts of fancy. A portrait, in the fourth room, by M. CAROLUS DURAN indicates how much has to be done before French effectiveness is reached.

(To be continued.)

THE MAISON CARRÉE, NIMES.

THE discovery by Professor W. H. Goodyear that some of the lines of the Maison Carrée which were supposed to be straight are curved, was mentioned some time ago in this Journal. In the *Architectural Record* for the present quarter the professor gives an account of what he ascertained on the subject, and it forms a most interesting essay. Professor Goodyear begins by describing the earlier discovery of a similar sort by Mr. F. C. Penrose, whose "Principles of Athenian Architecture" he terms an epoch-making work. An account is also given of Mr. John Pennethorne's revelation of the existence of curved lines in the temple of Medinet Habou. A century earlier the Parthenon was carefully measured by Stuart and Revett, but they were regardless of the phenomenon. The reason for the long delay in perceiving the reality is, says Professor Goodyear, that "the modern eye is dull and blunted as compared with the eye of the Greek. People look, but they do not see." It is therefore not surprising that the discovery of similar curves in the temple at Nîmes should have been delayed until the arrival of an American student. The professor says:—

No doubt an occasional student or observer has noticed these curves in the Maison Carrée and set them down to the score of masonry displacement, a fact so common in old buildings that the first thought of every architect and builder would naturally be that the timbers of the roof had thrust out the cornice and that the curve was not in the original construction. This is why I took pains to arm myself, when at Nîmes, with certificates from the official architect of the city and from his predecessor in office; the latter being especially familiar with the roof and upper masonry of the Maison Carrée; to the effect that these curves are in the masonry construction, although these gentlemen had not previously observed the fact.

Herewith are the certificates:—

The undersigned, Eugène Chambaud, ex-architect of the city of Nîmes, after examining the curved lines of the Maison Carrée with Mr. Goodyear, has verified the existence of these curves as being in the said construction, with the proviso that the curve on the east flank has been exaggerated by a thrust of the roof timbers, but also verifying the fact that there has also been a curve on this side in the original construction—considering that the line of bases in the engaged columns is curved on this side as it is on the other, and that there has been no thrust here; considering also that the movement (owing to thrust) is far from having been sufficiently great to produce the curve of the cornice. He considers the theories of Mr. Goodyear regarding the perspective effects of the curves as a reasonable one, and remarks that the theory regarding the perspective effect of a convex curve is new but possible. He has observed with him that the variations of inter-columnar spacing on three sides of the monument would undoubtedly have a perspective effect, according to Mr. Goodyear's ideas. The joints of the cornice on the west side, where there is a curve of 11½ centimètres, as measured by Mr. Goodyear, are intact, with one exception, which is not important for the question of the curve.

Nîmes: February 23, 1891.

E. CHAMBAUD.

February 20, 1891.

The measures herewith have been taken with the assistance of Mr. Augière, architect of the city of Nîmes. He witnesses to having observed the curves with Mr. Goodyear, and he verifies the fact that there has been no thrust in the cornice of the west flank. As professor of perspective he wishes to say that he considers the theory of Mr. Goodyear regarding the perspective effect of a convex curve in plan new but reasonable. As to the effect of a concave curve in plan it is familiar to experts in perspective.

A. AUGIÈRE.

I must add that on one side of the Maison Carrée the curve has been exaggerated by a subsequent movement of the masonry, and that on this account I confined myself in measurements for the cornice to that side where the masonry is in thoroughly good condition. For measuring the cornice curve I employed tin-roofers, who scaled the building by ropes, and dropped a plumb line to the pavement below. The curves of the cornice, wholly due to masonry construction, are in horizontal planes convex to the position of the spectator, and measure about 5 inches.

I also made measurements on the line of the stylobate which show slight corresponding curves in the line of the temple wall and of its engaged columns along the plinth line. I have no hesitation in saying that even on the line of bases of the engaged columns resting on the stylobate there are slight convex curves in both temple walls on the long sides. It is also certain that the great increase of the curve above was obtained by leaning out the walls and engaged columns at the centre.

It now remains to say what is the importance of this observation on the Maison Carrée. First, it overthrows the presumption of scholars that the Greek curves were unknown to the time of the Roman Empire, whose taste has been so far considered too coarse for this refinement. This observation, therefore, carries the history of the Greek curves from the time of the fifth century before Christ, down to the time of the second century after Christ. It extends the life of this Greek refinement seven centuries later than as previously known. Second, it reopens the question as to the purpose of the Greek curves. The explanations which have been previously offered must be revised or supplemented to some extent, because the explanations previously offered have referred to curves in elevation and not to curves in plan.

This brings us back to the explanations so far offered for the Greek curves. We have seen that the German architect Hoffer was the first to announce the Parthenon curves in publication. This was in 1838. Hoffer's explanation was that the curves of the upper lines were intended to accent and exaggerate the effects of curvilinear perspective and thus give increased dimensions to the building when seen from a point of view facing the centre of either side, but he also considered them as giving life and beauty to the building, and as superior to the more monotonous and colder effects of mathematically straight lines. This latter view is the one which has mainly figured in the standard compendiums of the Germans; for instance, in those of Kugler, of Schnaase and of Jacob Burckhardt. It has not been abandoned by the publication of Thiersch, whose essay is the only contribution to the optical and mathematical questions involved, aside from those of Penrose and Pennethorne. Thiersch, however, in the main, accents and develops the point of view of Penrose. The views of the latter as to the theory of the curves have naturally been most familiar to English and American students, and as his measurements are our only authority for the facts, his theories have naturally been generally accepted by his English and American readers. The explanation of Penrose moves from the accepted fact that there is a tendency to optical downward deflection in the straight line of an entablature below the angle of a gable or pediment. It is his theory that these lines of the entablature were accordingly curved upward in order to counteract this defection. As to the curves of the flanks Penrose regards them as a consequence incident originally on the methods pursued for the entablatures under the pediments, and then adds:—

"We may attribute the use of this refinement to the feeling of a greater appearance of strength imparted by it, to the appreciation of beauty inherent in a curved line and to the experience of a want of harmony between the convex stylobates and architraves of the front and the straight lines used in the flanks of the earliest temples. And farther, if we may suppose the first examples of its application on the flanks to have occurred in situations like those in which the two temples above mentioned (viz. the Parthenon and Olympian Jupiter Temple) are built, the presence of a delicate, but not inappreciable curve in what may be considered as Nature's great and only horizontal line may possibly have combined with other causes to have suggested its use."

Although Penrose is distinctly of the view that the hardness and dryness of modern copies of Greek architecture are due to the absence of these refinements, his effort is in each case of the various refinements quoted at the opening of this paper, to look for an optical correction as distinct from an optical illusion; and yet for the most important curves of all, viz. those of the long sides of the temple, he does not even suggest that an optical correction was needed.

We come finally to the views of Boutmy, "*Philosophie de l'Architecture en Grèce*," 1870, who returns to and revives the idea of Hoffer of a perspective illusion, but still confining his explanation to an effect from one point of view, viz. that opposite to the centre of the sides or ends of a temple.

Now, the importance of the observation of curves in the

Maison Carrée is that they were not applied to the pediments at all, but exclusively to the sides. The theory of an optical correction is therefore insufficient, and the theory of a perspective illusion appears to be the only one left us; but this theory has never previously been announced as an explanation for the construction of curves in plan convex to the point of vision. It is, however, clear that all curves in plan convex to the line of vision produce an effect of curves in elevation. I am indebted to Professor William R. Ware, of Columbia College, for the information that at an angle of 45 deg. a curve of 5 inches in plan, when not perceived by the eye, will produce an effect of 5 inches curve in elevation. From all points of view further removed the effect will be less, but the builders of the Maison Carrée and of the second court of Medinet Habou seem to have purposed to make this good by making the curves correspondingly heavier to begin with.

In the Parthenon the curve is under 4 inches in 228 feet. At Medinet Habou the heaviest curve is 8 inches in less than 100 feet, and at Nîmes it is nearly 5 inches in about 100 feet.

To the above points we must now add the general revision in the attitude of archæology to the question of curves in ancient architecture, which is probably involved in my observations for curves in plan in the courts at Karnak, at Luxor, and at Edfou. The conservatism and habits of repetition in Egyptian art would under any circumstances make it highly improbable that the curves in Egyptian architecture were confined to the one temple of Medinet Habou; but we have seen that, owing to the late announcement by Pennethorne (1878), and the general oversight by Egyptologists of this announcement, their existence even here is still generally unknown to science. A few words then as to my own observations in Egypt. My trip here was made in the interest of other studies, and the subject of lotus ornament and its influence on Greek patterns. My measurements and observations were consequently hurried and imperfect. Still, here are the facts. Although the great court at Karnak is so filled with rubbish that one can climb in several places to the top of the architraves, I am able to announce, as far as these architraves are concerned, that curves convex to the court are visible. At Luxor the columns of the largest court on two sides have leaned forward so far as to threaten downfall, and have been shored up accordingly by beams during and since the excavations not quite completed in 1891. Measurements taken by me in all three courts at Luxor show curves in all lines of columns at the bases, all convex to the centres of the courts, varying from $1\frac{1}{2}$ to 7 inches. It is clear at Medinet Habou that the lower curves in the lines of the bases, and in the lines of columns near the bases, were comparatively slight, and that the curve was obtained in the architrave and cornice (as it was at Nîmes) by leaning forward the centre columns. This would explain the movement of the masonry which has required the columns at Luxor to be shored up by timbers. All earthquakes and other forces tending to disintegrate these buildings, such as pulling down and destroying the accessible parts of the temple, would tend to exaggerate the lean of the centre columns, and bring about the threatened downfall now imminent at Luxor. My observations at Edfou point the same way. On all four sides of the court I have measured curves in the line of the bases of $1\frac{1}{2}$ inch on each side of the court. Very heavy curves, of 10 inches in one case, appear in the cornice lines; but the cornices have moved forward, and the original lean of the centre columns has been exaggerated by accidental tipping. The joints of the columns have parted at the rear, and it will require careful examination and survey at Edfou to show how much of the upper curve is due to movement of the masonry and how much is due to construction. One main fact remains to be mentioned for Egyptian temples. Although their curves have so far been utterly ignored and neglected excepting by Pennethorne and myself, the existence of other perspective illusions is admitted for Egyptian temples by Egyptological experts.

It is noted by a number of authors that the temples were generally built with pavements rising toward the sanctuary, and with roofs gradually lowered in the same direction, and that this was done for perspective illusion. Maspero is one of the authorities who mentions this. Mention is also made of this by Rawlinson and by Professor Reginald Stuart Poole.

Although these various observations point to a perspective purpose in the Egyptian and Greek curves, I do not wish to appear to antagonise the view that optical refinements were used in Greek architecture to correct optical illusions, for I believe that they may have been so used; but I wish to point out that the theories which are confined to correction are insufficient to meet all the facts, and that the theories which have considered the creation of optical illusions to have been one purpose of the refinements are now materially strengthened.

The existence of a temple at Nîmes having curves on the flanks without having them in the entablature of the pediments tends to antagonise the view of Penrose, that the correction of a downward optical deflection below the pediment was the first cause of the introduction of the curves in Greek architecture.

The temple of Neptune at Paestum is quoted by Penrose in support of his view, as having only curves under the pediments, but strange to say this temple at Paestum has been subsequently announced by Jacob Burckhardt to have convex curves on its flanks in horizontal planes. This observation is also quoted by Thiersch. Thus I close my paper by pointing out that we have at Paestum one ancient Greek precedent for the curves in plan at Nîmes, and that both point to Egyptian influence. The city of Nîmes was settled by a colony of Alexandrian Greeks from Egypt. It appears therefore probable that the curves in Greece were derived from Egypt and had the same purpose, but that the curves in the Egyptian courts were generally changed to curves in vertical planes by Greek art. This was a more refined expedient for attaining the same end, less conspicuous in buildings using colonnades for exterior porticoes as distinct from buildings using colonnades for the interiors of courts. It is comparatively easy to sight for a bulging curve on the exterior of a building, but more difficult to sight for it in the interior of a court. I was not able, for instance, to sight for the curve at Medinet Habou without going on the roof of the portico, but at Nîmes I was able instantly to sight for the bulge on the long sides from the level of the street. These facts, therefore, coincide with the view that the general purpose of the curves in Greek art was connected with the wish to have them inconspicuous, and that the curves at Nîmes represent either a direct influence from Egypt or the coarser taste of the Roman period. On the other hand the flank curves of the Neptune temple of Paestum, which is a very early Greek building, will represent the period of direct Egyptian transmission to Greece.

As it is generally conceded that Vitruvius drew his matter from earlier Greek authors whose works have perished, and that he did not always fully comprehend the ideas of his sources, I have omitted any argument concerning his direction that the stylobate curves are to prevent an effect of "alveolation" (i.e. downward deflection) at the centre of the stylobate. The only modern author who has attempted to explain this direction by optical theories is Thiersch. This author gives his reasons for supposing that a spectator standing near an angle of the stylobate and below the level of its platform might experience an optical effect of downward deflection in the lines of the stylobate which an upward curve would correct, but inasmuch as a bulging curve in plan could not correct this effect for the standpoint near the angle, I have not considered his theory in this paper, and I only mention it as giving one more illustration of the new light thrown on the Greek refinements by the discovery of curves in horizontal planes. There are very valuable remarks in Boutmy's work as to the general unreliability of Vitruvius for a comprehension of the Greek curves, and one purpose of this paper is to accent the value of Boutmy's contribution to the philosophy of Greek architecture. His work also contains quotations from Greek authors on the optics of architecture showing that intentional optical illusions and intentional optical corrections were alike familiar to them.

There is one thing more to be said before I close. The credit for the original suggestion that there is an historic connection between the Greek curves and those of Medinet Habou belongs to Mr. Pennethorne, as does the credit for both discoveries. The wholly original part of this paper as regards historic facts is that which points to the fact that two classic buildings—one early Greek at Paestum and one late Roman at Nîmes—show convex curves in plan which are identical in character with the curves in Egypt. The wholly original part of this paper as regards observations is that which relates to Nîmes, Karnak, Luxor and Edfou. The wholly original part of this paper as regards the effect of the Greek horizontal curves is that which shows the optical results in actual historic buildings of convex curves in horizontal planes. I am willing to leave the question of purpose to the expert and to the general reader.

NORTHERN ARCHITECTURAL ASSOCIATION.

THE members of the Northern Architectural Association paid a visit to Billingham and Norton Churches, architects being present from Hexham, Newcastle, South Shields, Darlington, Stockton, and Middlesbrough. The weather was unpropitious, but notwithstanding this a very pleasant afternoon was spent. The thanks of the members are especially due to the Rev. Phillip Rudd for kindly showing the members over the interesting church of Billingham, and the Rev. T. E. Scott for giving permission to look over Norton Church.

In the evening a conference was held in the Masonic Hall at Stockton, to which local practitioners were invited. At the meeting, which was presided over by the president of the Association, Mr. Joseph Oswald, the advantages of the Association were laid before the local architects by the president and Mr. A. B. Plummer, the secretary. Several suggestions were made, the principal one being as to the desirability of forming a local centre of the Association, and the meeting proved very interesting.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE annual general meeting of the Institute of Architects was held on Monday evening. Mr. F. C. Penrose, president of the Institute, was in the chair.

The Annual Report.

The business was the consideration and adoption of the annual report of the Council, which, after referring to the losses the Institute had sustained since the issue of the last report by the deaths of Mr. Wyatt Papworth, Mr. Ewan Christian, royal gold medallist and President 1884-86, and Sir Henry Layard, hon. Fellow, who had been connected with the Institute forty-four years, and who had received the royal gold medal in 1868, showed a satisfactory state of affairs. The Fellows numbered 604, and the Associates 921. During the past twelve months five Fellows (who were previously Associates) had been elected, and 91 Associates (19 of whom were previously students), while the number of hon. Associates was 61, and hon. corresponding members 55. The number of students had increased from 101 to 143, and of probationers from 577 to 736.

The art standing committee reported that, in view of the fact that one or, possibly, two important new bridges across the Thames at Vauxhall and Lambeth were in contemplation by the London County Council, they had given special attention to the matter, in order to secure structures worthy to rank with Waterloo and London Bridges. Although the committee regretted that their endeavours to secure stone structures had been unsuccessful, they desired to record their sense of the courtesy and attention with which their views had been received by the bridges committee of the London County Council.

TESSERÆ.

The Hamilton Vases.

A FEW objects, and those of little value, were contained in the British Museum till the year 1778, when Parliament granted a sum of 8,400*l.* for the purchase of Sir W. Hamilton's collection of ancient Greek vases and various other objects of art. This collection, perhaps the finest ever known at that period, was a great acquisition to the country, and ought to have opened the eyes of the Government to the utility arising from similar acquisitions. In fact the discovery of these vases and their communication to the public by engravings coinciding with the discoveries of Herculaneum and Pompeii may be considered an essential epoch in the history of the arts, and contributed greatly to their revival. The spirited designs which ornamented them were studied by artists, and contributed singularly to improve the public taste. Their elegant forms, as well as the perfect quality of the clay and varnish, were analysed and imitated by Wedgwood and other chemists and manufacturers. The public were so much pleased with these imitations that our pottery was improved, and became an object of extensive demand in foreign countries. In a fiscal point of view, there can be no doubt that the money expended for the purchase of the collection in question has been repaid a hundred fold to the nation at large, and proportionally to the revenue.

False Symmetry.

Nature's rule of no waste no want is a pattern for us in our buildings. A heavy building or roof on slender pillars of lead or brick would be unhandsome, even if they should stand untouched by side strokes and uphold their weight, as they would beget in a beholder's mind a thought of the unsteadiness of the building, and of their unfitness for their office. So, on the other hand, to build a stone pier for the uphanging of great coats or hats, or a great though handsome stone bracket, such as we have somewhere seen, for a light clock-head, would be an uncomely waste of stone and strength, as unfitting in its kind as that of two men who might take a great shoulder-pole to carry a skein of worsted. On the other hand, a font which is to gather round it minister and people, from whom it may receive a shock, and who, for the peace of their minds in prayer, should have no misgiving of trust in its stability, can hardly be too massy. Another fitness of things is that of number. That we should have two legs or two hands we can readily perceive, even without a loss of either of them, as we can perceive that a bird or insect should have two wings, and as we are taught by the stereoscope that we need two eyes. We can thus understand the good of the animal and other dualities upon which the Greeks grounded the use of their dual word-form in their speech. But some seem to have applied this two-foldness of life-forms to buildings, in which there is no such need of it. To make a blind window in a wall only to match a light-receiving one, or in the building of a stair-climbed turret to build a turret as its fellow only for the sake of a needless fellowship, or a matching of one with one, seems to be a slighting of the rule of fitness—no waste no want—and so

of a rule of the beautiful. A better rule might be, "Let your want give your plan, and then grace it as you can."

Collars and S. S. Chains.

The meaning and origin of the letters which form a part of chains worn by chief justices are lost in obscurity, and antiquaries have puzzled their brains in vain to give a satisfactory explanation. Indeed it has been doubted whether they are letters at all, or merely links of the chain accidentally formed in that shape. Mr. Foss is inclined to adopt the opinion that the S. stands for Souvèze, and has come down to us from the old days of romance when emblems were placed on collars to express some sentiment, or as the abbreviation of a motto. Mr. Foss declares that no authentic trace of the S. S. chain has been found on the monument of any chief justice until the reign of Edward VI. Some twenty years ago the Chief Justice of the Common Pleas was said to have worn the chain which belonged to Sir Edward Coke. Lord Ellenborough had the one which adorned the neck of Sir Matthew Hale, but kept it on his retirement in 1818. Lord Denman gave his to the Corporation of Derby, "whose mayors will thus in future be decorated with the livery collar of the earl who took his title from that town, and who as Henry IV. first attached it as a mark of honour to the members of the royal household." Lord Campbell bought and kept his chain, and his example was followed by his successors.

The Spiritual in Art.

The eternal power of a great work of art is the spiritual element of man which remains the same through all changes of feeling or of thought. The pride of life, ardent patriotism and heroic endurance, which formed the Greek ideal of manhood, has little in common with the doubts, difficulties and discoveries of our century, and were the vital power in their art dependent upon these qualities it would long since have ceased to interest us. But the spiritual element which elevated men and women into ideals of beauty is with us still, though with changing circumstance it has changed its aim. Where do you think the divinity of those old statues came from? Did it arise from the big muscles and smooth skins of the models who sat for them? No, the divinity was then, as it is or should be now, in the artist's mind, in the meaning which he saw through his spiritual insight. People talk vaguely about the spirit of beauty in these Greek statues, but the same loveliness (though not the same amount of technical perfection) is to be found in all great works of art as in these, and it arises from the painter or the sculptor having expressed in the work not only his sensuous and intellectual, but, chief of all, his spiritual insight. Says George Eliot, "A woman's arm touched the soul of a great sculptor two thousand years ago, so that he wrought an image of it for the Parthenon that moves us still as it clasps lovingly the time-worn marble of a headless trunk." What is it that moves us still? The beauty of the marble curves alone? Surely not, for if so our admiration must be of the same kind, though infinitely inferior to that we bestow upon the ordinary every-day reality. Or is it the fineness of the execution, its perfection of delicacy and strength? None of these would move us to aught but critical admiration, cold as it is clear. No, the essential loveliness is that which has passed into the marble from the soul of the sculptor, it is his feeling which we are brought into contact with, his love which moves our own. This is why all schools of painting have inevitably ended in lowering the standard of work, for after all a school is nothing but the attempt to produce works like those of a given master. And as the vital principle of that master's conception lay in a quality inimitable by his pupils, the attempt is a similar one to that of making a living body from the accurate imitation of a wax figure. The first condition of an artist being this finer sight, which reveals to him depths of thought and emotion, which are hidden from his brethren, how can he communicate this insight to his pupils, and how without it can they even comprehend the meaning of his work?

Animals in Lombardic Architecture.

A peculiar feature in the architecture of the Longobards is the introduction of sculptures on internal or external surfaces or inlaid works on pavements, sometimes illustrating scenes from the Old and New Testaments, but especially revelling in the grotesque fantasies quite without religious import—sirens, dragons, griffins, nondescript creatures or the signs of the zodiac, later admitted conspicuously among details in sacred buildings. One writer, Hammer ("Fundgruben des Orients"), refers these fantasies to an Oriental and Gnostic source, assuming that they were first introduced into Christian architecture, but in a sense adverse to sound doctrine, by degenerate Templars in the East, who had derived them from the fanatical sort of Ismailians or Assassins. But a cogent "object" to this theory well urged by Ricci is that the Templars, whose Order arose in 1128, had been long preceded by the Longobards in such architectural originalities, and that no intercourse with the East anterior to the Crusades can be supposed to have im-

ported anything of the kind into a school of northern Italy. By the twelfth century this strange symbolism had encroached into painting as well as sculpture, and become so prominent in churches as to excite the reprobation of St. Bernard. That eloquent saint may have been right in opposing it, and yet such a marked novelty in the development of sacred architecture has a value and import of its own; its shows us the Northern imagination, wild, sombre, grotesque, undergoing the Christian influence, yet still retaining its peculiar tendencies, which now find place in the service of that religion that appropriates while it illumines what it touches, is alike at home amidst the brilliancy and splendour of the modern Italian basilica and the dim-lit aisles of the Gothic minster, and in its large comprehensiveness embraces all forms of genius, all energies and biases of nationality. We may remember how from early ages Christian legend had peopled earth and air, the desert and the ocean, with mysterious beings, ever foes to man—

Viewless and deathless and wondrous powers,
Whose voices he heard in his lonely hours.

From familiarity with the idea of which demon intelligences, hideous when manifest, infernally evil in operations, it is not unnatural that uncultured minds should return scared and horror-stricken into the walks of reality, thus disposed to translate their visions or fears into such art as practitioners schooled by classic teaching had hitherto never thought of, as the clergy under the immediate guidance of Rome would not probably have sanctioned. The happy idea of enlisting animals into the Christian service for the expression of sentiment and truth had indeed its origin in the art of the catacombs, and as it developed itself the place of such creatures in the sanctuary became more distinctly marked, their meaning more definite.

Venetian Colouring.

The system of the Venetian school corresponded with the way in which Nature herself atones for the want of light and shade in hot countries. In short, the character of nature in Venice and in the works of Titian and others, is to produce light and dark by colour, the noblest and most general system of imitation. In Greece the sea and sky are sometimes the darkest parts of the general picture. The monotony of a sandy ground is relieved on one side by the sparkle of marble, and on the other by the depth of the cypress and evergreen oak. So much for inanimate nature; but we find the deep rich tones of men and animals, and even the dresses of the first, all combine to make amends for the want of that shadow which the northern climates have without colour. The Venetians, therefore, formed their style from the study of Italian nature. There is very little light and shade (except in the landscape) and a great deal of deep colour. In a hand, for instance, by the time the half-lights and shadows are done (both differing from the colour of the light) the mass of flesh colour is lost. In the Venetian pictures and in nature looked at largely the local colour ends only with the outline, and to give the utmost quantity the Venetians make the outline also warm. This forms a considerable part (applied to everything) of the breadth of colour so admired in Titian. The simple question, What is the general character of the object to be represented? explains the style of Titian, for he always penetrated it. Many appearances in nature have more than one general characteristic by which they are universally recognised. Thus, while Titian aimed at the quality of depth in the sky, Claude seems to have loved another of its attributes, and, reflecting that the sky was the source of light, he seems to have determined that brightness was its universal character. Claude seems to have copied the forms of trees in a relative point of view, their forms assist his composition, and their tone gives brightness to his sky; but Titian always expressed the universal character of a tree, viz. growth. It is always bursting with the efforts of vegetation. The forms are hence often peculiar, and at first one would say that Claude is more general in his choice of trees; but what appears accident in Titian's case is really the character.

Mediæval Painting.

The art of architectural painting reached its culminating point in the twelfth century. The stained glass, the miniatures and ornaments of manuscripts, and the fragments of mural decorations of the epoch announce an advanced state of art, a singularly comprehensive knowledge of the value of colour and its harmonious arrangement, and a coincidence between that harmony and architecture. It is certain that the art of architectural decoration developed itself in the cloister and proceeded from Byzantine art. The most beautiful stuffs, furniture, decorated utensils, and a great number of illuminated manuscripts were then brought from the East and were preserved in the treasuries and libraries of monastic establishments, and were used by the monks as models in their own art labours.

NOTES AND COMMENTS.

MR. MARTIN UNDERWOOD, who was lately found drowned in the river at Bolton, Lancashire, was at one time a member of the firm of architects, LLOYD, WILLIAMS & UNDERWOOD, of Denbigh, North Wales. He gained honours as a student at University College, London. He was first in construction and in fine art, &c., won the prize at the Royal Institute of British Architects, was made Fellow of the Society of Arts in 1879, was author of a standard work on the "Castles and Churches of North Wales," and for many years contributed largely to the professional press. He was an exceptionally talented architect, and his artistic work was of a very high order. He was fifty-five years of age, and to the last industrious and deeply interested in everything relating to art. Work was to him a pleasure, and he entered into anything that required creative power and a development of the beautiful with the enthusiasm of a young man. He was endowed with the gift of originality that few possess in an equal degree. Rapid in work and untiring in effort, he accomplished throughout his professional life more than most men are capable of doing. In his later years he had been unfortunate, and the end of his life came before the reward which he so well deserved.

OFFICIAL information has been issued by the Italian Government relating to the exports of paintings and other works of art from Italy during the past year. The number of new paintings was 4,437, the value being 845,531 lire or 33,800*l*. The examples of sculpture numbered 971, the value being 484,336 lire. In addition there were 9,090 works of various classes valued at 644,344 lire. The paintings by old masters numbered 916, the value being 213,150 lire; the sculpture 165, of the value of 225,865 lire, and smaller works such as gems, medallions, &c., numbered 36,988, the value being 559,390 lire. In the month of June occurred the largest increase in the last item, for by the sale of the Boyne Collection 22,769 coins and medals, including 1,572 Greek and Roman, 13,641 Mediæval and modern, and 7,556 Renaissance examples, were sent out of Italy.

It is a great pity that on occasions the Archbishop of CANTERBURY will discourse on art. His grace, it must be frankly said, is, in general, too indifferent to the subject to be able to speak with the authority which should belong to the spiritual head of the English Church. What his grace said about Sir FREDERIC LEIGHTON'S painting in Lyndhurst Church was a revelation of his relation to art. His grace said the artist lent one of his most beautiful pictures to the church. Afterwards there was a correction in the *Times*, and it was said to be a present. But if his grace really cared for art, he would have visited Lyndhurst during his visits to Hampshire, when it would be discovered that Sir FREDERIC LEIGHTON did more than lend or present one of his easel pictures, for the *Ten Virgins* under the east window in Mr. WHITE'S church is a fresco, and was, therefore, painted on the spot. It is hard when a painter makes a great sacrifice to decorate a church at his own expense that he cannot gain proper acknowledgment from the dignitary who should be the foremost to render him justice. The Archbishop's carelessness is not to be compensated for by mock mysticism concerning the office of painting to give "to the British nation a real insight into the life, the spirit and the universal inwardness of things." We should like to discover the universal inwardness of the blunder which his grace perpetrated when talking about the Lyndhurst picture.

THE exhibitions in the Grafton Gallery are delightful to the public. As they have generally a special purpose they are far more interesting to painters and students than the miscellaneous collections which are seen elsewhere. The latest exhibit is devoted to "Fair Children," and it reveals how many painters from TITIAN to those of our time have treated the most difficult class of subjects. Portraits like the two children of Lord CREWE are as much a testimony to REYNOLDS'S diplomatic skill as to power as a painting. It is evident the little lady enjoyed her appearance as an

old woman going to market as much as her brother when he posed as Bluff King HAL. That great painters could not always prevail with young sitters is evident from HOLBEIN'S *Edward VI.*, who must have been always in an ill temper in spite of what historians say. VELASQUEZ was more fortunate, although Spanish princelings were confident in their superiority, and somehow his *Infanta of Spain* appears at first sight to be a work of HOGARTH'S. ELIZABETH of Bohemia appears as a sort of royal Mrs. GUMMIDGE, and poses as "a lone, lorn woman," but her children are shown to be more natural and sincere by VAN HOUTHORST. On the countenance of the melancholy Prince of ORANGE, afterwards WILLIAM III., REMBRANDT was able to compel a smile to appear. HUDSON'S series of children are charming, and it is no wonder his pupil REYNOLDS followed his example in dealing with young folk. ROMNEY also was excellent. With LAWRENCE the tradition was lost. In modern times children have to be shown more conscious of their charms. But there are many portraits here where they do not appear to be posing. Sir J. E. MILLAIS is supreme in this class of work among his contemporaries. There are half a dozen of his masterpieces in the collection. But happily there are many other painters whose works are worthy to be hung near his portraits. Mr. WATTS, Mr. GREGORY, Mr. RICHMOND, Mr. PHIL MORRIS, Mr. SANT, Mr. BREUN, Mr. CALDERON, Mr. LESLIE, Mrs. ALMA TADEMA, the Marchioness of GRANBY, Miss KATE GREENAWAY, are represented by charming examples.

His residence in London has not made M. HENRI ROCHEFORT more enamoured of modern French art than he was in the days when he used to write about it under the pseudonym "Grimsel." Judging by what he has seen in the two exhibitions just opened in Paris, he says he is struck by the flatness of the figures, which seem to be glued to the canvas. The painters might never have seen a work by REMBRANDT, VELASQUEZ or VAN DYCK. The modern tendency to have only faded and grey colours is, says M. ROCHEFORT, almost heart-breaking. He believes that painters who should be masters are affected by the impressionists, and cannot do justice to themselves through fear of being considered "pompiers," which to a Frenchman is as hateful as old-fogeyism is with us. In the Champ de Mars exhibition M. ROCHEFORT says there are four or five good pictures, especially M. ROLL'S *Joies de la Vie*. The modern French sculpture he considers surpasses what is produced elsewhere, and when the Scandinavians and Americans have supplanted the French in painting, which may take place before long, M. ROCHEFORT believes they will still retain supremacy in sculpture. M. ROCHEFORT considers that in execution English painters are inferior to the French, but we are generally endowed with an artist so gifted that the mediocrity of the others is pardoned. He refers to the *Field of Repose*, or convent burial-ground, by Sir J. E. MILLAIS, as being incomparable in its melancholy beauty. M. ROCHEFORT could not fail to give a philosophical turn to his lamentation over the decadence of French art. He concludes by expressing the belief that there is one law for tenors and painters, and as after a limited time it is impossible for the former to reach the high *ut*, in the same way the painters give way to mechanical processes and decoloration.

FROM the statement of Alderman KENRICK it appears that the Municipal Art Schools and Art Gallery in Birmingham are in a flourishing condition. A loan exhibition of marine paintings by British artists attracted 141,219 people. The permanent collection was not, however, neglected, and no less than 24,142 catalogues were sold to visitors. If judged by the test of the national competition the art school surpassed all others in efficiency. Last year one gold, twelve silver, eighteen bronze medals and forty-five book prizes were gained. Birmingham thus obtained seventy-six awards, while Nottingham gained only thirty-three, Glasgow thirty-two, Manchester thirty-one, Sheffield twenty-four and Leicester nineteen. The expenditure on the school during the year was 6,581*l*.

The Architect, May 10th 1895.

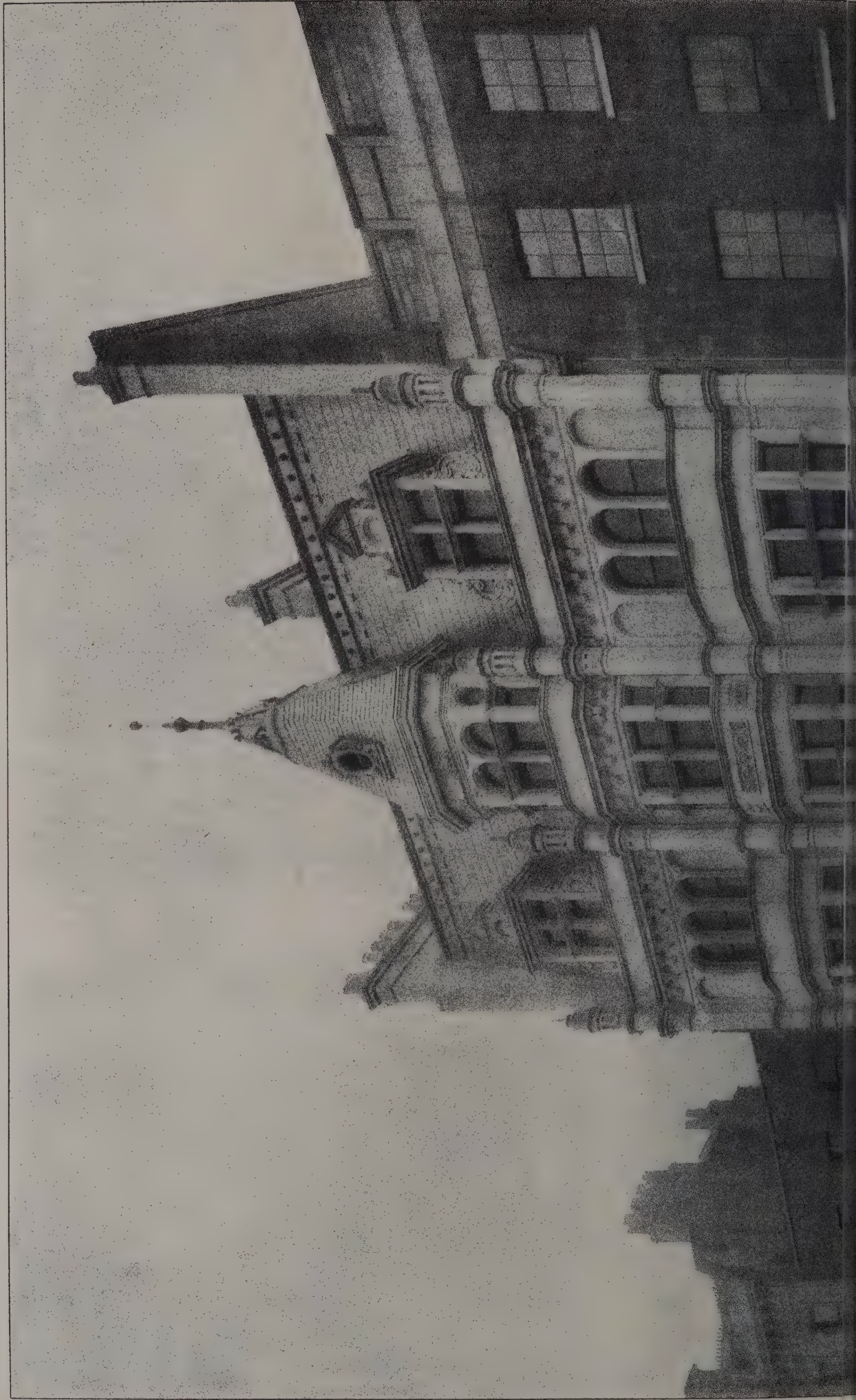


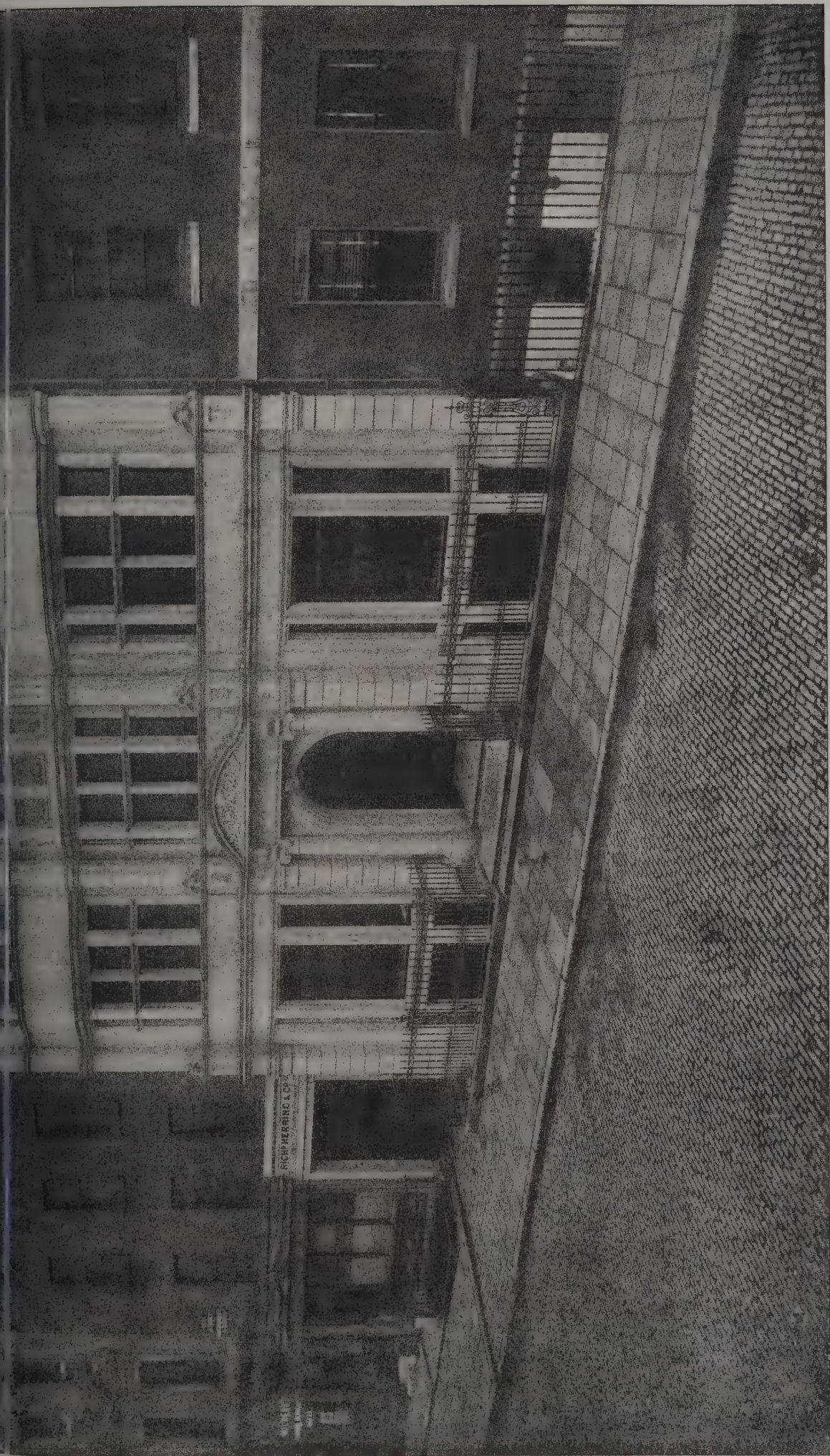


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STAIRCASE LANDING: AUDLEY END, ESSEX.

The Architect, May 10th 1895.





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PREMISES, WEST STREET, FINSBURY.
Messrs. DAVIS & EMANUEL, Architects.



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10th 1895.



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CONSTITUTIONAL CLUB, PICCADILLY.
Architect.

ILLUSTRATIONS.

STAIRCASE LANDING: AUDLEY END, ESSEX.

PREMISES, WEST STREET, FINSBURY.

STAIRCASE LANDING: JUNIOR CONSTITUTIONAL CLUB,
PICCADILLY.

THE GOBELINS.

IN France, and in some other continental countries, the State maintains one or two factories for the manufacture of articles in which great scientific skill in conjoined with artistic ability of the highest order. Of this kind are the celebrated porcelain manufactory of Sèvres and the equally celebrated tapestry factory of the "Gobelins." In these countries the idea of the State meddling in trade is considered repugnant to all laws of political economy, an opinion which admits of some exceptions. If a Government undertook to make shoes or any other article of common use, which could be equally well made by any trader, we should naturally condemn such a proceeding. But if, on the other hand, we could find some manufactures in which the articles were of so expensive and peculiar a nature that it would be hopeless to expect that they would become articles of general consumption, and therefore not likely to be produced by private enterprise, and which, on the other hand, would require for their production a considerable development of mechanical, chemical and artistic skill, which would be available for the use of the nation in many other branches of manufacture, the case would be different. Such are the manufactures of the Gobelins, for no person who examines the beautiful products of that establishment will come to any other conclusion than that, except as curiosities, they are of little use. How, then, it may be asked, can the manufacture of curiosities become a proper application of the funds of a nation? Simply thus: to produce a piece of tapestry requires, in the first place, the highest possible skill in the preparation of the wool, in its purification, bleaching, and above all, its dyeing; and, in the next place, an equally high degree of artistic education in adapting the materials to the reproduction of the pictures intended to be copied. The Gobelins must, therefore, be a school of design and of chemistry applied to dyeing, and that France has benefited by this school is evident by the immense superiority which she has attained in these branches of industry over every other nation. It is from this point of view that we specially value the Gobelins, and judged on this ground we believe the enormous sums spent in France in its support for more than two centuries are now being repaid with interest to the nation.

The building called the Gobelins is situate in a *quartier* of Paris celebrated in the annals of the first revolution as the Faubourg St. Marceau. Through this district flows, or rather used to flow, for it is now enclosed in a canal of stone, and shut up by sluices, the small river Bievre, which in former times enjoyed a reputation for dyeing scarlet, which it certainly does not now deserve, being generally considered a nuisance at present from the exhalations of its stagnant water. This traditional reputation, however, brought to its banks a family of dyers from Rheims, the chief of whom was Jean Gobelin. This was about the end of the fifteenth century, for Jean and his son Philibert lived there in the time of Rabelais, who says, "and it is this brook which from here passes to St. Victor on which Guobelin dyes the scarlet." Gradually their descendants became wealthy, and at length renounced trade, purchased patents of nobility, and intermarried with the families of the magistracy. One of these, Antoine Gobelin, Marquis de Brinvilliers, married in 1651 Marie Marguerite d'Aubrai, daughter of the Civil Lieutenant of Paris, who became so notorious afterwards in the annals of crime by the poisoning of her whole family.

When the Gobelins retired from business they sold their establishment to the Sieurs Canaye, who, in addition to the trade of dyeing, set up a manufactory of tapestry of haute lisse or high warp. At that time Flanders was celebrated for its tapestry, which was exported to different countries, one of the chief seats of which at one time was Andernaerde. To the family of Canaye succeeded a dyer of the name of Glück, whose family continued in possession until the time of Colbert, minister of Louis XIV., who purchased the house properly called the Gobelins, whilst the family of Glück, in conjunction with another named Julienne, carried on the trade of dyer in the adjoining buildings down to the commencement of the present century.

It will be seen that the manufacture of tapestry was at first altogether carried on by private enterprise, and continued to be so until the reign of Francis I. That monarch, to whom France owes so much in an artistic point of view, brought together the best workmen in tapestry to be found at that time in France, in

Italy or Flanders, the countries where the trade was best understood, and established them at Fontainebleau, under the direction of one Salomon de Herbaines. Here he provided them with abundance of the richest materials, such as gold, silver and silk threads, and a number of admirable pieces were executed after designs by an Italian artist named Francesco Primaticcio, pupil of Giulio Romano. Francis I. also purchased the best pieces of tapestry made by private manufacturers, so that this kind of manufacture was in a most flourishing condition during his reign. His successor, Henry II., continued to maintain the establishment at Fontainebleau, which was placed under the direction of the distinguished artist, Philibert de Lorme. Then came the wars of the League, during which, as in all civil and religious struggles, the trade of the country languished, and that of tapestry altogether ceased, for neither the Court nor the nobles could afford to devote money to any other purpose than the payment of troops. As soon, however, as Henry IV. was firmly seated upon the throne, and peace was re-established (towards the year 1600), he set about the organisation of factories for the manufacture of furniture and of all kinds of ornaments for his palaces. He established his tapestry-workers in a house in the Faubourg St. Antoine, in Paris. Here he collected a number of the best painters, engravers, carvers in gold, silver and ivory, and sculptors, to whom he added 200 tapestry-workers from Italy and Flanders. Henry was carried off prematurely in the midst of his projects for the re-establishment of the industry and art of France, and unfortunately he left in his son, Louis XIII., a successor quite incapable to realise them, who, or rather his celebrated minister Richelieu, however, established a carpet manufactory at Chaillot, near Paris, in some buildings which had been employed in the manufacture of soap, from whence the establishment since become so celebrated has derived the name of "La Savonnerie." Owing to the state of France at that period the manufacture languished, and was almost extinguished during the long wars of the Fronde and other troubles during the minority of Louis XIV. As soon, however, as the latter monarch assumed the reins of government, he endeavoured to organise the commerce and manufactures of the nation. A royal factory was established at Beauvais for the manufacture of tapestry, under the direction of Hinart; the Savonnerie was placed under the direction of the celebrated painter Le Brun, and the children of the hospitals were there trained in the manufacture of various woollen fabrics by Philippe Lourdet, at that time distinguished as a tapestry worker and carpet weaver. Even the private factories of Felletin and of Aubusson were provided with a dyer and a painter at the expense of the Government. The efforts of the Government were soon crowned with success, and the manufactures of France became in a few years the most flourishing in Europe. In order to still further contribute to their advancement, the king determined to found a model factory in which he might concentrate the highest degree of talent in the nation, not for the purpose of exposing private enterprise to a disproportionate competition, but, by serving as an example to artisans, to elevate the whole taste of the nation. It was with this intention he established in the house of the Gobelins his celebrated "Manufacture Royale des Meubles de la Couronne," or Royal Manufactory of the Furniture of the Crown, since better known as the Manufactory of the Gobelins. It was not, however, a simple factory of tapestry that Louis XIV. established; it was a great workshop, under the direction of Le Brun the painter, having at least 250 tapestry workers continually employed in executing pieces after his design, the wool being dyed by one of the most celebrated dyers of the period. Then there were sculptors in metal, and goldsmiths, by whom were executed torch-holders, candelabra, brackets, inlaid and applied ornaments, cast or chiselled in silver, gold, bronze or gilded copper, designed in unison with the tapestry. Cabinet-makers and carvers in wood and ivory constructed the furniture, whilst Florentine artists, under the direction of Ferdinand de Melini, inlaid them with marbles, agates and lapis lazuli, representing fruits, flowers and birds, which are still so much admired by all who visit the Palace of Versailles. Even the very hinges and locks of the doors of Louis XIV.'s palaces were made after designs executed at the Gobelins, under the direction of the universal Le Brun. The effects of the factory were soon perceptible in the impulse given to the application of design in all the manufactures of France, which ultimately gave to that country the empire of the world in matters of taste as applied to the wants of life.

The direction of Le Brun, which lasted from 1667 until 1693, was the epoch of the greatest prosperity of the Gobelins. He was succeeded by Pierre Mignard, one of the most distinguished painters of France, many of whose works adorn the Louvre and the Palace of Versailles; and under whom it continued to prosper until the great disasters which befel France towards the end of the reign of Louis XIV. forced the king to reserve his resources for the defence of the country, and to dismiss the greater part of the workmen. On the re-establishment of peace some encouragement was given to the Gobelins,

but its splendour was gone, and from that time forward it became a mere manufactory of tapestry.

During the first revolution the Gobelins was naturally neglected. Louis Philippe was, however, a great patron of the Gobelins. Some very fine works were executed for him, such as the copy of Horace Vernet's *Massacre of the Mamelukes*, which was at the London Exhibition of '51. The fine hangings representing the *Marriage of Francis I.*, and other scenes from the life of that monarch, after pictures of Rubens in the Louvre, were either made or at least begun under the Restoration.

THE FIRST SCOTTISH CHURCH.

UNDER the title "Scots Lore" a new publication was brought out at the beginning of the year by Messrs. W. Hodge & Co., of Glasgow. It is intended to be "a medium of intercommunication, a field for discussions and place of record" for information about the past. The publishers say they have received assurances of support from antiquaries and other specialists. In the last number is a remarkable speculation or "leap in the dark" by Mr. P. Macgregor Chalmers concerning St. Ninian's "Candida Casa," which was the earliest stone church. The exact site has given rise to much controversy among archaeologists. In the course of his article Mr. Chalmers says:—

On a visit to the cathedral church at Whithorn my attention was arrested by a peculiar feature in the ruins at the west end of the nave. Little more can be seen than a long confused mound of earth and stone, from 4 to 5 feet high. It begins a few feet from the gable of the cathedral and extends for a considerable distance towards the boundary wall of the churchyard. The foundations of walls lie buried in this mound. Thirteen feet from the cathedral the lower courses of a rubble wall are visible, lying parallel to the gable. The opening in the centre, on the medial line of the cathedral, is 6 feet wide, the jambs are plain and square, and the wall is 3 feet thick. The two walls which project at right angles towards the west are 10 feet apart. This is the foundation on which I have now to build. And my hope is that I may find here the site of St. Ninian's Church—the first Christian church in Scotland erected in stone.

King David I. re-established the diocese of Candida Casa, or Whithorn, in the period from 1124 to 1130. Fergus, lord of Galloway, during David's reign founded a priory at Whithorn for canons of the Premonstratensian order. The church, which was dedicated to St. Martin of Tours, to whom had been dedicated the original church by Ninian, doubtless formed the cathedral church of the diocese. Only the nave of the cathedral remains—a thing of patches, to which the builders of many generations lent their hands. The beautiful Romanesque doorway at the west end of the south wall is the one fragment preserved of the early twelfth-century foundation by Fergus. Its position may be held to indicate that this fabric did not extend further to the west than the line of the present gable. It is known that the three walls whose ruins have been described above are parts of the foundation of the steeple or tower which was in existence when Symson wrote his description in the year 1684. This tower was of considerable height, and formed a striking landmark on the coast. As the ruins show that there was a building of some kind to the west, and as it is clear, from an examination of its western face, that walls extended westward from the cathedral gable to join the wall forming the eastern face of the tower, it is evident that the tower occupied the centre of some building. Notes and studies on the plans of other structures, to which reference will now be made, have led me to conclude that it stood between the chancel and nave of an earlier church than that founded by Fergus. If it is possible to bring the plan to light, the spade may prove that there is an opening in the west wall of the tower, similar to that in the east wall, with a door, perhaps built up, in the south wall. . . .

St. Ninian, according to his biographer, "chose a site for himself in the place which is now called Whithorn. This place is situated on the shore of the ocean, and running far out into the sea, is enclosed by the sea itself on the east, west and south, the way being open to those who would approach it only on the north. Here, therefore, by the command of the man of God, the masons whom he had brought with him built a church, before which, they say, no other had been built in Britain in stone. And inasmuch as he learned that the most holy Martin, whom he always venerated with wondrous affection, had now passed away from the earth to the heavens, he was careful to dedicate it to his honour." The church was founded in the year 412. The walls were doubtless plastered over in the Roman manner with adamantine cement, as was done in St. Wilfrid's Church at Hexham. From this circumstance, and not from the use of white material in the building of the wall, the name Candida Casa arose. St. Ninian died on September 16, 432. He was buried, says his biographer, "in the church of the blessed Martin, which he had himself built

from its foundation, and was placed in a stone sarcophagus beside the altar. At his most sacred tomb the infirm are healed, lepers are cleansed, the wicked are terrified and the blind receive their sight."

The Church Council which was held in Britain in the year 692 was assembled by King Ina for the union of the Britons with the Saxons. It is not until the year 723, on the establishment of English bishops, that we learn of any successor to St. Ninian. Pictahelm was consecrated in that year. The succession of bishops was interrupted about 794, probably because of the anarchy in the country following the assassination of Æthelbert, and nothing further is heard of the bishops of Whithorn, until the see was re-established by King David I. in the early part of the twelfth century.

The history of the early fabrics referred to above leads me to suggest that the history of this church whose site is under consideration followed on similar lines. Erected in the first place as a nave with apse and western porch, the church was extended by the addition of a new nave to the west, the porch being reared as a tower. If this was the case, then the presumption is that the site of St. Ninian's Church has been found. The building was probably erected at the beginning of the eighth century, on the establishment of the Saxon see. And yet it is not altogether impossible to suppose, as Bede mentions the existence of a stately church in his time, that part of Ninian's work remained until the last. It was probably planned on the same model as the churches of the early part of the eighth century, for Ninian brought his masons from the renowned abbey of Marmoutier in France. The preservation of the church as a separate building, when the early twelfth-century foundation was laid, was an example followed at St. Andrews and other places.

The latter-day name of this early church is known. It was called the Outer-kirk, or Cross-kirk. As mentioned above, the seal of the chapter of St. Andrews, of date 1450, presents an interesting view of the early church of St. Regulus. Two seals of Whithorn are preserved, and on both a picture of the old church appears. One of the seals is of the year 1613; the other is probably, judging from the character of the lettering, of about the middle of the fifteenth century. The tower stands between the very short chancel and nave. Its high-pitched roof resembles that on the tower in the seal of St. Andrews. The pinnacles, and probably the upper part of the tower, are late works. The panel shown in the base of the tower, extending upwards to the wall-head, is evidently intended to represent the deep recess between the chancel and nave, due to those parts of the building being broader than the tower. We have seen that this feature existed in all the examples referred to above, with the exception of the church at Jarrow.

The fame of the miraculous powers possessed by the relics of St. Ninian spread over Europe. It was evidently to this church—this Outer-kirk—the pilgrims came. There is no more striking feature in the strangely romantic character of King James IV. than his great veneration of this saint, and many were the visits he paid to the shrine. James V. took staff in hand in the years 1532-3, and pilgrimages to the shrine had become so much a part of the life of the people that they were continued after the period of the last Reformation. They were only abandoned when prohibited and made punishable by an Act of Parliament in 1581.

This is neither the time nor the place to enter on a discussion of religious movements. It ought to be borne in mind, however, that there have been three great Reformations in Scotland. The Reformation at the end of the sixteenth century was, perhaps, more of a revolution than a reformation. It led to no new development in the planning of fabrics. An attempt was made to get back to primitive forms of church government and it may be said that the new religious order instituted was of secular clergy. The Reformation at the end of the eleventh century, with which the name of St. Margaret will for ever be associated, was necessary because the early church had become petrified as a local church, having for long ceased to regard the new developments and reforms emanating from the great centre at Rome. Monastic orders to a large extent took the place of secular clergy. The influence exerted on the fabric of the churches may still be seen in our great cathedrals and abbeys, with their transepts and aisles, and wide ranges of conventual buildings surrounding a garden. The altar now became the focus of the church. The Reformation at the end of the seventh century is associated with the name of St. Wilfrid of York. The Columban Church, which was monastic in its establishment, and whose buildings were of the most primitive type, and, as a rule, of timber, gradually lost touch with Rome. The early saints were held in great reverence, and little or no attention was paid to the advancing tide of thought and organisation. Fresh from his Roman school Wilfrid found the clergy at home preaching and practising heresy. Ardent and eloquent, the Columban Church gave way before him, and soon his influence was exerted over Northumbria and the lowlands of Scotland. As a revolt against the evils of monasticism he instituted orders of secular clergy.

Wilfrid's Reformation brought with it a model church plan. As described above, it consisted of a nave with a semicircular apse at the east end and a porch at the west. This plan probably came from Rome, through France, but I find the original not so much in the Roman Basilica as in the smaller and simpler Roman Curia.

To many it may seem remarkable, yet it is true, that the table or altar held a more or less subordinate place in the arrangement of the interior of the early church. Wilfrid was not revolting from early Roman custom when he made the focus of his church the bishop's or abbot's seat or *cathedra*. The seat was placed on an elevated platform in the centre of the apse behind the altar, and the clergy were accommodated on each side. This was a suitable and satisfactory arrangement, designed for a church which looked to the bishop or abbot as the apostle of Christ. The change which was made at a later time may be traced to the Council of Rheims, held on October 3, 1049, when it was forbidden for any bishop, except the Pope, to assume the title of "Apostolic." The church still maintained its logical position in that the Pope alone retained his place behind the altar, as he does at the present day. Two bishops' seats associated with the northern church and with the name and period of St. Wilfrid still remain. One is Wilfrid's own seat at Hexham. The other, in Beverley Minster, is the chair of St. John of Beverley, who preceded Wilfrid in the see of Hexham. What I presume was Wilfrid's chair at York is referred to in a charter of the time of Henry VII.

Development was not impossible with the plan adopted by Wilfrid. It has been noted above that as necessity arose the fabric was enlarged. But it is important to observe the method of enlargement. In every case referred to a new nave was added at the west end. The old porch was retained in the centre, and on this a central tower was reared. With the exception of Jarrow Church, in the examples cited, the tower is of less width than the chancel and nave. At Monkwearmouth and Jarrow there are openings in both the north and south walls; in Restennet and St. Regulus the opening is in the south wall only. When church plans were brought to this stage it was but a short step farther and the transeptal form was attained. The side arches were already in existence, and all that was necessary in order to secure rudimentary transepts was to utilise the unsightly recesses on the exterior elevations by building walls across in line with the walls of the chancel and nave. Development was slower in North Britain than in South Britain or the Continent, and there was certainly no opportunity for the gradual and full realisation of the transept in Scotland because of the inflow of the great tide of advanced foreign art towards the end of the eleventh century. But it is interesting to notice that there was a movement in that direction. If in this the architects of Scotland were but following in the wake of their brethren on the Continent, a reasonable and practical theory of evolution has been established.

Here endeth the first chapter. Setting out with the expressed hope of finding the site of St. Ninian's Candida Casa, to that search I have added the desire to place the study of early church fabrics on a broader basis than I found it.

But a second chapter is still required, and for that the spade is more fitting than the pen. The task of digging must be left for others more conveniently situated. If, on the ground which I must assume to be the site of St. Ninian's Church, the spade brings to light all that has been anticipated, my leap into the dark will be amply justified. But if, on the other hand, the facts are not as I have ventured to predict, the reader may yet be pleased to think that this note has not been written altogether in vain.

"Scots Lore," it will be evident from the quotation, merits the attention of all who take an interest in archæology. The new publication is of a convenient size, and is well printed.

THE NATIONAL GALLERY.

THE annual report of the director of the National Gallery to the Treasury has appeared during the week. According to it the following twenty-three pictures were purchased during 1894:—

Portrait of a Gentleman, by Gerard Terborch; Christ before Pilate, by Rembrandt van Rijn; A Study of Still Life, by Pieter Snyers; A Laundry Maid, by Henry R. Morland; A Laundry Maid, by Henry R. Morland; The Annunciation, by Fra Giovanni Angelico; Pegwell Bay, Kent, by William Dyce, R.A.; The Mystic Marriage of St. Catherine, by Andrea Cordelle Agii; The Virgin and Child, by Ambrogio Borgognone; The Adoration of the Shepherds—The Dead Christ (a diptych), by Ercole de' Roberti; The Virgin and Child with the Infant St. John, by Filippino Lippi; supposed Portrait of Anna Maria van Schurman, by Gerard Dou; The Agony in the Garden, by Andrea Mantegna; St. Jerome in his Study, by Antonello da Messina; The Legend of St. Giles, Flemish School; A View in Haarlem, by Gerrit A. Berck-Heyde; A

Terrace Scene, with Figures, by Jan Steen; View of the Rotunda at Ranelagh, by Antonio Canale; The Baptism of Our Lord, by Pietro Perugino; The Virgin and Child with Two Saints, by Filippo Mazzola; The Dead Christ—a Pietà, by Hans Baldung; View of the Quay at Southampton, by R. H. Lancaster; Edfou, Upper Egypt, by J. F. Lewis, R.A.

The bequests and donations to the gallery were as follows:—Ippolita Torelli, by Sir Charles Lock Eastlake, P.R.A.; Portrait of Mr. Philip Sansom, by Sir T. Lawrence, P.R.A.; Portrait of Philip Sansom as a Child, by Richard Westall; Tobias and the Angel, by Adam Elsheimer; An Old Woman Sewing, Dutch School, sixteenth century; Portrait of James Northcote, R.A., by John Jackson, R.A.; Portrait of a Boy, by John Opie, R.A.; a porphyry bust of The Dying Alexander; a palette used by the late Ford Madox Brown; an illuminated initial letter, Italian School; The Holy Family, by Eustache Le Sueur; Portrait of a Lady, by Jan Anthonisz Ravesteijn; A Portrait Group, by Le Nain; St. John Leading the Virgin Mary from the Tomb, by William Dyce, R.A.; An Architectural Subject with Figures, by Domenico Beccafumi.

Mr. Henry Tate, whose wish to present his collection of modern British pictures to the nation has been long before the public, and whose gift of a building in which to house them and to form a National Gallery of British Art had been accepted by the Government, having expressed to the Chancellor of the Exchequer a desire that the collection should be under the control of the trustees and director of the National Gallery, the matter was brought before the Board at a special meeting on June 16. The Board passed a resolution that it is prepared to accept the trust and control of the Tate gift, subject to the future consideration and approval of such details respecting the management and administration of the new gallery as may be settled between the Chancellor of the Exchequer and Mr. Tate; and the trustees and director, in accordance with a request from Mr. Tate, visited his collection at Streatham, and made the selection of such pictures as they considered suitable for the national collection, and Mr. Tate consented to the exclusion of a certain small number. A deed of gift was drawn up by the solicitor to Her Majesty's Treasury, and was agreed to by the Board; at a subsequent meeting the deed was executed, and, by request of Her Majesty's Office of Works, has been returned to that Department.

The trustees and director again call the attention of their lordships to the want of space for the proper arrangement of the national collection; in many of the rooms, the early Flemish room especially, it is necessary to hang valuable pictures in places where they cannot be properly seen, still less studied; there are many branches of art in which the collection is ill represented, notably the French school of the seventeenth and eighteenth centuries, and it will shortly be impossible to find room for the necessary additions to fill up these and other gaps in the collection. Besides this, a gallery for the proper exhibition of the Turner water-colour collection, now housed in rooms on the ground floor, ill adapted for the purpose, is urgently needed. It is respectfully suggested that while waiting for the promised removal of the adjoining barracks, a small further extension of the gallery to the west might be proceeded with at once. The trustees and director would call their lordships' attention to the urgent necessity for the removal of the barracks. When it is considered that the barracks are in actual contact with the National Gallery buildings and that a fire might occur there at any moment (as actually happened some years ago at the Wellington Barracks) they trust that the priceless treasures of the national collection may not be exposed to such a risk longer than is necessary.

A rearrangement of some of the rooms in the gallery was made during the autumn. The large picture by Holbein, called *The Ambassadors*, had been standing on a screen in the Umbrian Room since its purchase in 1891, where it was out of its proper surroundings and not well seen. In order to make room for it on the wall, Room No. IV. was cleared of the early Florentine pictures, some of the most important and earliest of which were placed in the North Vestibule at the head of the stairs, a remarkably well-lighted position, and others were inserted by a readjustment in Rooms I., II. and III. The Flemish pictures were removed from Room XI. to Room IV., and so arranged as to form room for placing the Holbein, not, however, without somewhat overcrowding the room, with the result that some of the pictures in this fine collection have to be placed where they are less well seen than heretofore. Room No. XI., thus set free, was devoted to pictures of the Dutch school, many of which had been scattered in the central octagon among Italian pictures, and many on screens, where they were very ill seen. The result is the better chronological arrangement of the Florentine pictures (though for want of space this still remains somewhat imperfect), a better position for the Holbein, and an additional room, which was much wanted, for pictures of the Dutch School, and eleven screens, the use of which is always objectionable as filling up the floor-space, were dispensed with. The principle of this rearrangement was agreed on before the director left for Italy in October last,

and during his absence was carried out by the keeper, Mr. Charles L. Eastlake.

The Velazquez and the Moroni, purchased at the same time as the Holbein, had previously been hung on the wall in the Spanish and Venetian rooms respectively.

The gallery was visited by 498,182 persons on the public days during the year, showing a daily average attendance on such days (208 in number) of 2,395.

On students' days (Thursdays and Fridays) 44,643 persons were admitted between January 1 and December 1, 1894; the admission fees (at 6d. each) amounting to 1,116*l.* 1*s.* 6*d.*, as compared with 974*l.* 8*s.* received in 1893.

The total number of students' attendances at the National Gallery on Thursdays and Fridays throughout the year was 20,232. Independently of partial studies, 865 oil-colour copies of pictures have been made, viz 307 from the works of 83 old masters, and 558 from the works of 56 modern painters.

THE FINE ART COURTS, SYDENHAM.*

THE idea and design of the Pompeian Court were first suggested by Sir Mathew Digby Wyatt, the eminent architect of the India Office, Parliament Street. He made the original sketch at Naples, and he was afterwards ably assisted by Signor G. Abbati, the well-known artist of Naples, to carry out the design. It represents a restored Roman villa taken from many examples that have been unearthed in excavating the sites of the ancient towns of Pompeii and Herculaneum. It may be taken as a representation of the best style of Pompeian decoration and architecture as found in the house of Pansa, the tragic poet. The best description of the plan or arrangement of the rooms will be found in the third chapter of the first book of Bulwer Lytton's charming novel "The Last Days of Pompeii." On entering the villa the visitor first passes along a short narrow entrance, called the vestibulum, on each side of which are the apartments of the slave guards into the atrium or open hall. The first three rooms on either side are the "cubicula" or bedrooms. The two further rooms to the right and left are the business rooms. In the centre of the tessellated pavement of the hall is the "impluvium," a basin and fountain. The hall opposite to the main entrance is the "tablinum," a large saloon in which were placed the tables, with vases, chairs and candelabra. To the right of this was the winter dining-room, and behind it the summer dining-room, while on the left was the principal bedchamber of the master and mistress of the house. At the rear was the "xystus" or garden, surrounded by the "peristyle" or open colonnade. On the left of this was placed the "frigidarium" or bath, and adjacent were the kitchens and other offices.

You will observe that there is no staircase in the house. Roman villas very rarely had upper stories, or occasions for them. Some of the houses, however, at Pompeii had upper floors, but these were rarely of importance, being mere attics, or rooms for slaves, but were sometimes used by merchants for stores. If I had to describe a Roman villa in the fewest words I should say it was "like a modern house turned inside out." A modern house has its windows looking outwards towards the forecourt or street, and back windows towards the rear-court or garden, and if detached would have side windows. In a Roman villa all this is reversed; the atrium, or fore-court, and the garden, cloister-like, are inside, and the rooms all surround them, with their windows looking inwards, the four external walls having no window openings whatever. This was done for protection. The Roman warned you at the entrance to "Cave canem"—"Beware of the dog," and his walls were built, "Defensio non provocatio," or, as our Volunteer friends would say, in a spirit of "Defence, not defiance."

Pompeii and Herculaneum, the two cities that were destroyed A.D. 79, were situated about five miles east of Naples, and contained conjointly a population of about 10,000 persons. Herculaneum, the larger town, about twice the size of the other one, and lying nearer to Mount Vesuvius than Pompeii, was covered with the stream of boiling lava, beneath which it still lies buried. Pompeii had, sixteen years previously, suffered severely from an earthquake, on February 5, A.D. 63; but on August 23, A.D. 79, the two towns were completely destroyed and buried by a violent eruption of Mount Vesuvius, when the elder Pliny lost his life. The best account of the event is given in a letter by Pliny the younger, his nephew, to Tacitus, the celebrated historian. He commences:—"To Tacitus,—Your request that I would send you an account of my uncle's death, in order to transmit a more exact relation of it to posterity, deserves my acknowledgments, for if this accident shall be celebrated by your pen, the glory of it, I am well assured, will be rendered for ever illustrious." He goes on to say that his uncle "was at that time with the fleet under his command at Misenum. On August 23 my mother desired him to observe

a cloud which appeared of a very unusual size and shape." It was found afterwards to ascend from Mount Vesuvius. "I cannot give you a more exact description of its figure than by resembling it to that of a pine tree, for it shot up a great height in the form of a trunk, which extended itself at the top into a sort of branches, occasioned, I imagine, either by a sudden gust of air that impelled it, the force of which decreased as it advanced upwards, or the cloud itself, being pressed back again by its own weight, expanded in this manner." He then proceeds to detail the circumstances of his uncle's death. In another account he says:—"Though it was now morning the light was exceedingly faint and languid, the buildings all around us tottered, and though we stood upon open ground there was no remaining there without certain and great danger; we therefore resolved to quit the town. Having got to a convenient distance from the houses, we stood still in the midst of a most dangerous and dreadful scene. The chariots which we had ordered to be drawn out were so agitated backwards and forwards, though upon the most level ground, that we could not keep them steady, even by supporting them with large stones. The sea seemed to roll back upon itself, and to be driven from its banks by the convulsive motion of the earth; it is certain, at least, that the shore was considerably enlarged, and several sea animals were left upon it. On the other side a black and dreadful cloud, bursting with an igneous serpentine vapour, darted out a long train of fire resembling flashes of lightning, but much larger. The ashes now began to fall upon us. I turned my head and observed behind us a thick smoke, which came rolling after us like a torrent. We had scarcely stepped out of the path when darkness overspread us, not like that of a cloudy night or when there is no moon, but of a room when it is shut up and all the lights extinct. Nothing then was to be heard but the shrieks of women, the screams of children and the cries of men; some calling for their children, others for their parents, others for their husbands; one lamenting his own fate, another that of his family; some wishing to die from the very fear of dying, some lifting their hands to the gods, but the greater part imagining the last and eternal night was come, which was to destroy the gods and the world together. The fire fell at a distance from us, then again we were immersed in the thick darkness, and a heavy shower of ashes rained upon us which we were obliged every now and then to shake off, otherwise we should have been crushed and buried in the heap. At last this dreadful darkness was dissipated by degrees like a cloud of smoke, the real day returned, and even the sun appeared, though very faintly, as when an eclipse is coming on. Every object that presented itself to our eyes seemed changed, being covered over with white ashes as with a deep snow."

Pliny, junior, also recounts in his letter to Tacitus how they went out, having pillows tied upon their heads with napkins, and this was their whole defence against the storm of stones that fell round them. Another writer, Dion Cassius, says:—"Day was turned into night, and light into darkness; an inexpressible quantity of dust and ashes was poured out, deluging land, sea and air, and burying two entire cities, Herculaneum and Pompeii, while the people were sitting in the theatre."

Bulwer Lytton says:—"The whole elements of civilisation were broken up. Ever and anon, by the flickering lights, you saw the thief hastening by the most solemn authorities of the law, laden with, and fearfully chuckling over, the produce of his sudden gains. If in the darkness wife was separated from husband, or parent from child, vain was the hope of reunion. Each hurried blindly and confusedly on. Nothing in all the various and complicated machinery of social life was left save the primal law of self-preservation."—(From "The Last Days of Pompeii.")

All this happened in the reign of Titus, the conqueror of Jerusalem.

Speaking of the villas, Signor Abbati, the artist I have already mentioned, says:—"It should be borne in mind that the dwellings of Pompeii are by no means adequate to present a complete idea of the magnificence of imperial Rome or of the sumptuous habitations of those who were regarded as the conquerors of the world, since Pompeii was no more than a city of the third rank. When, however, we perceive in the dwellings of the small city the admirable distribution of the various apartments, the purposes to which they were respectively devoted, the abundant supply of the luxuries and elegancies of life, the love of order, and the exuberance of art which they display, we cannot but remain impressed with wonder—and how much would that wonder be increased should we endeavour to form a notion of the great capitals of the country and of the residences of its consuls and emperors."

I will conclude with one more extract from Bulwer Lytton: "Pompeii was the miniature of the civilisation of that age. Within the narrow compass of its walls was contained, as it were, a specimen of every gift which luxury offered to power. In its minute but glittering shops, its tiny palaces, its baths, its forum its theatre, its circus—in the energy yet corruption, in

* A paper read by Mr. W. F. Potter, architect, at the visit of the members of the Upper Norwood Athenæum to the Crystal Palace.

the refinement yet the vice, of the people—you beheld a model of the whole empire. It was a toy, a plaything, a show-box, in which the gods seemed pleased to keep the representation of the great monarchy of the earth, and which they afterwards hid from time, to give, to the wonder of posterity, the moral of the maxim, 'that under the sun there is nothing new.' A very excellent illustration and description of the Pompeian Court appeared in *The Builder*, January 7, 1854.

To write a paper on each of the courts would fill a volume, and occupy too much time, as each one would occupy as much space, at least, as my short description of the Pompeian Court. I will, therefore, simply give a schedule or list of the chief wonders or objects of interest in each court.

The Egyptian Court

contains the celebrated rock-cut Temple of Karnak, or Hall of Columns, discovered by Belzoni in 1817. Here is also the famous Rosetta stone (in plaster). The original, now in the British Museum, was discovered by a French engineer in 1799, and bearing an inscription in hieroglyphic as well as Greek characters, gave Dr. Young a clue to translating ancient Egyptian hieroglyphics generally. Egypt is regarded as the parent of art.

Grecian Court.

This court contains the model of the Parthenon, built of marble at Athens. This celebrated structure was the most perfect example of Grecian architecture; it remained perfect till 1687, when, being used by the Turks as a powder magazine, an explosion occurred, which laid it in ruins. The friezes were removed to England by Lord Elgin, and are sometimes called the Elgin marbles. They are now in the British Museum.

The Roman Court.

Here is a model of the Colosseum, the largest of the Roman amphitheatres, commenced by Vespasian, and completed by his son, Titus, A.D. 80. The façade of this court is of Doric, with the round arch, the lowest feature of the Colosseum, whose second tier is of Ionic and the third of Corinthian columns. Observe the statue of Hadrian.

The Alhambra Court

was designed and constructed by Mr. Owen Jones, architect, from models brought by him from Spain. This court was destroyed by fire in 1866, but has been restored at great cost.

Romanesque Court.

Among other gems of art this court contains restored copies of the monuments of our earliest monarchs, the celebrated effigies of Fontevrault Abbey, in France, the burial place of the Plantagenets, consisting of Henry II. and his Queen Eleanor of Guienne, Richard Cœur de Lion and his Queen Berengaria. Here are also King John, from Worcester, and his Queen Isabella. The Emperor Napoleon III. offered to give the monuments now at Fontevrault to Queen Victoria, but the French press raised such an opposition to the proposal that Her Majesty waived her claim.

The Gothic Courts.

These contain copies of the famous doorway from Nuremberg and the abbey front at Tintern, Netley Abbey and Rochester doorway. These and other specimens have been reproduced under the superintendence of Sir Mathew Digby Wyatt, architect.

The Elizabethan Court

contains the façade of Holland House and the tombs of Queen Elizabeth and Mary Queen of Scots.

I have now come to the length of my tether, or rather end of my paper, but I shall not cry, like Alexander the Great, because there are no more worlds to conquer; on the contrary, I have rather been suffering from an *embarras de richesses*. There are still other gems, the Renaissance Court and the Italian Court, for instance, but if there are any objects of interest I have omitted, I would suggest that some of our younger friends take up the subject where I leave off, and if this were done by half a dozen members consecutively for the next six years, there would still be left something to write about and discuss both inside and outside the Crystal Palace.

DURHAM CATHEDRAL.

AT the annual meeting of the Durham and Northumberland Archaeological and Architectural Society the president, the Rev. Dr. Greenwell, proposed to hold an extra meeting at Durham. There had been, he said, important discoveries made in Durham Cathedral, namely, the remains of the east end of Carileph's Church. Before mentioning anything in connection with those remains, he thought it desirable to say that the discovery was made purely by accident. Several erroneous statements had been made respecting the discovery, but he repeated that it was purely accidental. A hole was made at the east end of the south aisle of the choir in connection with a proposed heating apparatus. Several other and similar holes

were made in other parts of the church. Whilst this was going on he accidentally went into the church, and his attention was drawn to the hole at the east end of the south aisle of the choir. When the wall was exposed he noticed a very remarkable piece of ashlar work, and thought it rather a curious thing for ashlar work to be there. It was entirely owing to his coming there at the moment that the place was not filled in at once. He asked the workmen to go down a little lower. They did so, and, as he had explained, by pure accident they came upon the head of the apse. The digging operations were carried on a little further, and the whole thing was brought to light. He might explain that previous to this he obtained the consent of the dean to make excavations on the platform behind the Neville screen. He got so far as to chalk out where it was intended to excavate, and was only waiting for a favourable opportunity when the workmen could be spared to begin. In the meantime this accident disclosed the apse of Carileph's Church. The excavations if carried out would unquestionably have resulted in the finding of the apse. It had been said, and he thought quite wrongly, that it was a portion of Aldhune's Church, that it was really the apsidal termination of that church. That had been completely set at rest so far as the excavations had been carried out. It was conclusively shown that it was not part of Aldhune's Church, but the termination of the aisles of the choir of Carileph's Church. This set at rest the whole controversy as to how the church commenced. There was nothing like the pick and spade to settle controversies of this character. They had settled the question of the three apses of the church of Durham. He proposed that they should have as soon as possible a meeting in the cathedral, when the whole subject would be entered into with special reference to the apsidal termination of the east end of Carileph's Church. That he proposed to be a special meeting and, as he said, to be held as soon as possible, and that he undertake to give the historical part; he did not mean to say the history of the Church of Durham, or anything connected with the history of Christianity or the Church of Durham ecclesiastically considered, but simply the history of the church as a building. He would endeavour to bring before them as far as he could, and as far as they had any records, all that was stated by various writers with regard to the various parts of the church of Durham, the building and architectural parts of the church, and to explain and thoroughly go into the whole question with regard to the eastern termination and the vaulting of the choir, which was a matter of very great importance and of very great dispute, as to whether it was vaulted as early as 1140 or at a later time. However, he need not enter into that question at present. The late discoveries were of so very great importance that they would all be glad to have an opportunity of having another meeting in the church, and taking these things into consideration, and also at the same time going through the whole of that very grand building.

The president afterwards spoke about the restoration of the chapter-house at Durham. In his opinion there ought, he said, to be restored the windows that were in the chapter-house at the time of its destruction in 1796. Instead of these there had been inserted Norman windows, which were of course without any authority. The discovery of the original keystone showed that the vaulting of the ribs was entirely wrong. If Carter's drawings and Carter's plan had been examined, it would have been at once seen that the ribbing put up is different and did not look anything like so well. Next turning his attention to the Galilee, the president said that the sharpness of the fine mouldings in the Galilee was rapidly disappearing in consequence of the fumes from the stoves. Dr. Greenwell proceeded to speak very strongly about there being students' rooms on the Norman gallery of the castle, and expressed the conviction that, unless a change was effected, sooner or later the whole place would be burnt down, the gallery being entirely of wood. He hoped the University authorities, who had plenty of rooms elsewhere, would remove the students from so very dangerous a part of the building, for in his opinion if fire once broke out there, nothing on earth would be able to check it.

THE ART OF CASTING BRONZE IN JAPAN.*

(Concluded from last week.)

FOR a little more than three-quarters of a century we have another golden age in its history, during which a succession of brilliant artists, distinguished by marvellous technical skill and originality of design, worthily maintained the best traditions of the founder's art, and Japan attained a position in *cera perduta* casting which she had never reached before.

Two men, Seimin and Toun, stand out prominently during the closing years of last century and the first quarter of the

* A paper by Mr. W. Gowland, A.R.S.M., F.C.S., F.S.A., late of the Imperial Japanese Mint, read before the Applied Art Section of the Society of Arts on Tuesday, April 23, 1895.

present. Others, among whom should be mentioned Harutoshi, Kunihisa, Kamejo, Teijo, Tauchi, approach these great masters in skill, even occasionally proving their equals.

In examining their works it will be noticed that, as among the painters, several were specially distinguished for their skill in the representation of certain motives. Sosen as a painter of monkeys, Ganku of tigers, Okyo of carp, &c., so among the founders several are similarly renowned; thus Seimin chiefly owes his fame to the perfect modelling of his tortoises, Toun and Somin for the vigour and life expressed in their dragons, and Kamejo for the delicate and truthful rendering of her quails. It is needless to say that they did not confine themselves to these, but executed other works not less demonstrative of their skill.

The human figure, however, does not form part of their naturalistic studies. The forms and movements of lower animal life are expressed with a truthfulness which has never been surpassed, but in representing man they seem rarely to have been able to free themselves from the conventionalities of the art dogmas of the old Sinico Japanese schools, and seldom show even traces of that close observation of nature which characterises their other works.

Portrait statues are of extreme rarity, those representing famous personages being merely conventional creations which are supposed to portray the type or class to which they belonged rather than the individuals themselves. This example would seem to be one in which an attempt has been made to produce with truthfulness a characteristic likeness of the man whom it is intended to commemorate.

With the death of the last representative of this brilliant group of art founders, near the end of the first half of the present century, the art gradually passed into a stage of decadence, the lowest depths of which it but recently reached, and from which it is only just emerging.

Vast numbers of bronzes have indeed been cast, but they are too often of meretricious design and tawdry ornament, or debased copies of the creations of Seimin, Taün and their distinguished contemporaries. Fortunately there are a few notable exceptions to this latter statement. In the first decades of the second half of this century Dosai, Gido, Somin, Jsun, Tanchosai, Toryusai did much excellent work, and ably sustained under considerable difficulties the reputation of their famous predecessors. Among more recent founders a distinguished position should be given to Suzuki Chokichi (now living), whose well-known magnificent example of *cera perduta* casting is in the South Kensington Museum. It is an ancient incense-burner with doves and peacocks, the doves especially being masterpieces of modelling, and an embodiment in bronze of the highest developments of the naturalistic school, of which Chokichi is an earnest and ardent follower.

And here I should like to say a word on the excessive crude and vulgar ornament which disfigures too many modern Japanese bronzes. Such ornament is never found on any vase, brazier, or other object intended for use by the Japanese themselves, but is confined to those articles specially made for sale to foreigners. These are all veritable "pot-boilers" cast by men often capable of doing better things, who earn more by the production of these vulgar monstrosities for exportation than others who still endeavour to follow the simple canons of Japanese art. Modern Japanese bronze-founders, like their brethren in pictorial art, hence work in an adverse environment, and under many disadvantages unknown to their predecessors. In the early centuries religious enthusiasm, the quiet seclusion of the monastery, and the patronage of a powerful priesthood, stimulated, fostered and supported the old artists in their work, so that all their powers were put forth in the execution of the grand masterpieces of those times.

In later times the same result was achieved under the system of feudalism which prevailed in the country. Workers in bronze were attached to the courts of the greater daimyos (territorial nobles), their incomes were secure, they were free to work out their designs as they wished, and need only do so when they felt inspired.

During recent years the Emperor has done much for the encouragement of a select few of the chief art workers in bronze in the revival of their old art, the result being that some of the objects of modern work which adorn the imperial palace are of extreme beauty, and equal those of the older masters in grace, fulness of form and sobriety of ornament. But for the great majority there is no such patronage; yet the bronze-founders must live, and to live means for too many that they must waste their talents in producing work in designing which they are hampered by the demands of commerce, and the chief, or rather sole, end of which is merely pecuniary remuneration. Up to the eighteenth century we rarely find the name of the artist or founder attached to any bronze. Most of the existing specimens of the earlier bronzes were made, as we have seen, for use in the ceremonies and ritual of the Buddhist religion, and were not usually allowed to bear any name, excepting when they were "ex voto" offerings, and then only the names of the donors. The records of the

temples are also silent with few exceptions, even on the authorship of the grand masterpieces to which they often owe their popularity and fame. The dedicators alone are remembered and the artists forgotten. Being almost invariably men of plebeian origin, the bronze-founders occupied a lower status in life than the calligrapher, painter, or armourer, and their lives have not been thought worthy of record; all the knowledge we have of even the great masters of the last generation is derived solely from their works.

Several charming specimens of both the larger and smaller bronzes—especially of the latter—as late as the last hundred years, are unfortunately not signed (especially the candlestick of fine open work lent by Sir Trevor Lawrence), and many of equal merit are signed by artists whose names do not appear in the lists of noted bronze-workers. So that the materials for a history of the men themselves—such as has been compiled of their fellow-artists, the painters—do not exist, and are but scanty and incomplete even for a record of their works.

ORFORD CHURCH RESTORATION.

THE following letter has been addressed to the committee for "restoration" by a recipient of their printed appeal for subscriptions:—

GENTLEMEN,—I have received your circular appealing for subscriptions to "restore" that priceless jewel, your lovely parish church. I am referring to the glorious portion of the fabric which remains as yet intact, and almost as its gifted creators left it.

Visiting the church a year ago I was charmed with the boarded-off portion (nave, north aisle, chancel, tower, south porch, &c.), and pray you to leave it as it is—with such repairs solely as are requisite for its maintenance—as a supreme work of art.

Surely the disastrous depravation of the south aisle as now "restored" is glaring enough to discourage further excursion in that direction—vulgar modern ecclesiastical small wares hideously out of place, the beautiful ancient-carved seats crucified against the walls, or against appalling stacks of hot-water pipes, slowly destroying them, their places usurped by rapid modern imitations. What has been so handled is dead for ever—sacrificed on the cruel altar of modern folly.—I am, yours faithfully,

Leek: May 1, 1895.

LARNER SUGDEN.

THE CHORLTON HOMES COMPETITION.

THE award has been made in the competition for the above, and the prizes have been allotted as recommended by the assessor, Mr. John Macvicar Anderson. In a subsequent letter to the Guardians Mr. Anderson, after further consideration, recommended that the third prize should be given to the designer of "Village Homes."

"A Home," first prize, Messrs. Charles Clegg & Son, of 104 King Street, Manchester; "Q. E. D.," second prize, Mr. J. W. Beaumont, of 10 St. James's Square, Manchester; "Village Homes," third prize, Messrs. W. Telford Gunson & Sons, of 10 Harsden Street, Manchester.

Mr. Anderson in his report says that so far as merit in design and adaptability is concerned he has no hesitation in placing the plans of "Snowflake" first, but as in these accommodation is only shown for 286 children, instead of 300, he has in consequence reluctantly felt compelled to disqualify the same for a prize.

The Guardians have, however, decided to adopt the plans of "Snowflake," whose author, Mr. J. B. Broadbent, of 1 Princess Street, Manchester, has been entrusted with the carrying-out of the work.

The following is the award:—

Gentlemen,—I have carefully examined each one of the eighteen sets of designs which have been submitted in competition for the proposed cottage homes and schools in the township of Styal, Cheshire, and so far as merit in design and adaptability for the purpose of the buildings are concerned, I have no hesitation in placing the designs in the following order, viz.:—

No. 1, Snowflake; No. 2, A Home; No. 3, Q. E. D.

It is, however, extremely unfortunate that the author of Snowflake provides accommodation for 286 children only, the condition of the competition being that "Provision is required at present for 300 children in cottages designed to accommodate not more than twenty in each;" and, further, that "First cottage to be at entrance gates, and to also act as the receiving wards."

The first cottage in the design of "Snowflake" is at the entrance gates, but it provides accommodation for six children only in place of twenty, leaving a deficiency of fourteen.

In these circumstances I am with great reluctance com-

pelled to disqualify the design of "Snowflake," and I accordingly assign the first place in the competition to the author of the design which bears the motto "A Home," and the second place to the author of the design which bears the motto "Q. E. D."

As coming next in point of merit, I would mention the designs marked respectively "Sunshine" and "Village Homes," although in the plans of the former I can find no room for sewing, which is one of your requirements, and in the latter the plan of the cottage homes is defective.—I have the honour to be, Gentlemen, your obedient servant,

(Signed) J. MACVICAR ANDERSON.

Manchester: May 1, 1895.

EDINBURGH ARCHITECTURAL ASSOCIATION.

AT the meeting of the Edinburgh Architectural Association, Mr. W. W. Robertson, president, in the chair, Mr. John Burn read a paper on plumbing, and he discussed in a technical way the questions connected with all kinds of inside and outside plumber work. Discussion followed. One point which was a good deal debated was the comparative merits of lead and zinc for roofing purposes. Most of the speakers favoured the use of lead. The value to be attached to the use of safety valves on kitchen boilers also came in for a good deal of notice. Most of the speakers advocated the use of the safety valve, but one speaker declared that he was invariably opposed to its use. It was, he said, a trap which led people into trouble by the valve getting stiff and unworkable. The proper safety valve was to have the pipes properly protected, so that there would be no risk of their being frozen. Some of the blame of the freezing of pipes was attached by certain of the speakers to the practice of having the pipes conducted through the house in chases which were mere ventilating shafts of cold air, but it was pointed out that a draught in the chase could be avoided by having the woodwork fitted close in to the pipes at each floor. There was a consensus of opinion that the cisterns should be so placed as to be accessible to the occupier of the house as to the plumber himself. Two or three of the practical plumbers remarked how much the introduction of drawn lead traps had occasioned the loss of practice among plumbers in the working of lead, and was consequently a bar to the education of the apprentice. At the close of the discussion the Association, on the motion of the Chairman, seconded by Mr. H. J. Blanc, adopted a resolution declaring that the Association recognised the efforts of plumbers to increase the efficiency of their trade by educational and other influences, and viewed with approval a system of registration such as that adopted by the Society for National Registration of Plumbers and by the Scottish Society for the Registration of Plumbers.



Manchester Municipal Technical School Competition.

SIR,—I enclose copy of correspondence which has taken place between Mr. Alfred Waterhouse, R.A., assessor in the above competition, Messrs. Spalding & Cross, authors of the first premiated design, and myself, and I do so in the hope that you will publish the letters and this communication, in order that the serious attention of the profession, the Institute and Association should be drawn to the matter.

The following were two of the conditions issued to competing architects by the Corporation of Manchester:—

"Due regard, however, must be paid to the amount of accommodation asked for, and to the cost, which should not exceed 75,000*l.* The Corporation reserve to themselves the right of verifying any estimate and disqualifying any design which they may consider likely to exceed the estimated cost by more than 5 per cent."

"No distinguishing mark, motto, or device must be put on the drawings, description statement, envelope or case by the competing architects or their agents."

You will perceive on perusing the correspondence that the condition as to limit of cost making the outside amount to be expended as 78,500*l.* has been ignored, this amount being nearly doubled, and that the condition as to "distinctive marks" was distinctly infringed, apparently with impunity, as Messrs. Spalding & Cross, in their letter of March 23, stated that "the assessor's attention was drawn to the matter before the award was made," although this is denied by Mr. Waterhouse, who, in his letter of April 25, says:—"If I had

noticed such a mark, and thought it was there for the purpose you intimate (the italics are mine), I should have rejected the design."

I intimated nothing as to the purpose for which the mark was there, but the fact remains that it was there, and that it has since been patched over and the sky washed over it to cover the patch.

It seems to me desirable for all parties that a satisfactory explanation should be forthcoming.—I am, sir, yours faithfully,

ERNEST RÜNTZ,
Author Third Premiated Design.

22 Moorgate Street, London, E.C.: March 22, 1895.

Gentlemen,—I enclose a copy of the Manchester *City News* of the 2nd inst., on page 6 of which you will find marked a statement to which I beg to draw your attention, as it not only concerns yourself but competitors generally. I shall esteem it a favour if you will kindly inform me whether there is any truth in the statement above referred to.—I am, gentlemen, yours faithfully,

(Signed) ERNEST RÜNTZ.

Messrs. Spalding & Cross.

22 Moorgate Street, London, E.C.: March 22, 1895.

Dear Sir,—I enclose a copy of the Manchester *City News* of the 2nd inst., on page 6 of which you will find marked a statement to which I beg to draw your attention, as it not only concerns yourself but competitors generally. I shall esteem it a favour if you will kindly inform me whether there is any truth in the statement above referred to.—I am, dear sir, yours faithfully,

(Signed) ERNEST RÜNTZ.

Alfred Waterhouse, Esq., R.A.

"I will say little about the competition for the Technical School, but Alderman Clay made a statement which caused great astonishment. Pointing to a plan of the building, he said, 'When that plan was put in competition it had a mark on it which distinguished it from all the others.' Two members of the committee stated that they did not know by that mark whose plan it was. Probably not; but it ought to have been rejected, because it had a mark in violation of the published conditions."—Extract from letter signed "Zadok" in Manchester *City News* of March 2.

15 Queen Street, Cheapside, E.C.: March 23, 1895.

Dear Sir,—In reply to yours, dated yesterday, enclosing a Manchester paper, we write to say, in reference to the question you raise, that there is not an atom of truth in it. There were no marks on our plans, but the draughtsman who prepared the perspective view put the arms of the city on it; but this was done out of our office, and without our knowledge in any way.

Mr. Waterhouse's attention was drawn to the matter before the award was made, and he evidently did not consider it violated the conditions of the competition, &c.—We remain, yours faithfully,

(Signed) SPALDING & CROSS.

Ernest Rüntz, Esq.

Crewe Arms Hotel, Crewe: March 25, 1895.

Dear Sir,—In answer to your letter of the 22nd, relative to an alleged mark on the selected design in the recent Technical School Competition, Manchester, I did not observe any such distinctive mark on any of the designs sent in, and most certainly I should have set any design aside having such mark, had I observed it.—Yours faithfully,

(Signed) A. WATERHOUSE.

Ernest Rüntz, Esq.

22 Moorgate Street, London, E.C.: April 2, 1895.

Dear Sir,—I beg to acknowledge with thanks receipt of your letter of the 25th ult. with reference to the statement in the Manchester *City News* of March 2 last.

Simultaneously with my former communication to you I sent a similar letter to Messrs. Spalding & Cross, and now enclose a copy of their reply, dated March 23, in which you will see they admit a distinctive mark was upon one of their drawings, and state that your attention was drawn to it.

I am not writing this in any captious spirit, but because it is a matter that should be thoroughly cleared up, bearing in mind the stringency of the conditions of the competition in question.

Whilst upon this subject may I also ask whether the condition stating that any design which was deemed by the assessor as likely to exceed the sum of 75,000*l.* by 10 per cent. was framed to be broken or adhered to, my reason for asking being that a tender for the schools amounting to 141,500*l.* has, I am informed, been accepted. I hear that a storey has been added to the original design, but this would hardly absorb 60,000*l.*, and the original design would therefore appear to largely exceed the stipulated cost of 75,000*l.* plus 10 per cent.

I am raising these points not alone on personal grounds, but in the interests of all who enter for competitions, as it is most disheartening for any architect who conscientiously strives to send in designs in strict conformity with published conditions to find any of them ignored in the final selection by the assessor. Awaiting the favour of a reply, I am, dear sir, yours faithfully,

(Signed) ERNEST RÜNTZ.

Alfred Waterhouse, Esq., R.A.

22 Moorgate Street, London, E.C.: April 11, 1895.

Gentlemen,—I am obliged to you for your letter of the 23rd ult., a copy of which I forwarded to Mr. Waterhouse, with whom I had previously communicated. I happened to visit Manchester last week, and whilst there a most extraordinary statement was made to me o

the effect that the distinctive mark of the arms of the Corporation of Manchester upon your perspective drawing (to which you refer in your letter) had been cut out; the drawing, I understand, is hung in the existing Technical School. I shall be glad if you will kindly inform me whether there is any foundation for such a statement.—Awaiting the favour of a reply, I am, gentlemen, yours faithfully,
Messrs. Spalding & Cross. (Signed) ERNEST RÜNTZ.

15 Queen Street, Cheapside, E.C.: April 11, 1895.

Dear Sir,—In reply to yours of this date, the perspective drawing to which you refer has remained with the committee since the competition was decided, and we have not touched it, nor dealt with it in any way. We think this correspondence must now cease.—Yours sincerely,
(Signed) SPALDING & CROSS.

Ernest Rüntz, Esq.

22 Moorgate Street, London, E.C.: April 16, 1895.

Gentlemen,—I beg to acknowledge receipt of your favour of the 11th inst. You appear to have misunderstood my last letter informing you of a certain statement as to the distinctive mark having been cut out from your perspective drawing. I have not suggested that the drawing has been again in your possession, neither have I directly or indirectly charged you with having tampered with it or dealt with it in any way, as you apparently assume; all I wish to know from you is, whether there is any truth in the statement quoted in my letter to you of the 11th inst., without reference to the person or persons (if any) responsible for the alleged mutilation of the drawing in question. A direct answer to this inquiry will in all probability close the correspondence as far as you are concerned.—I am, gentlemen, yours faithfully,
(Signed) ERNEST RÜNTZ.

Messrs. Spalding & Cross.

22 Moorgate Street, London, E.C.: April 22, 1895.

Gentlemen,—I shall be much obliged if you will favour me with a reply to my letter of the 16th inst.—I am, gentlemen, yours faithfully,
(Signed) ERNEST RÜNTZ.

Messrs. Spalding & Cross.

15 Queen Street, Cheapside, E.C.: April 22, 1895.

Dear Sir,—We do not know that we have anything to add to our former letter except to remind you that the drawing to which you allude is the absolute property of the Manchester Corporation, and that therefore you should refer to them for any information.—Yours faithfully,
(Signed) SPALDING & CROSS.

Ernest Rüntz, Esq.

22 Moorgate Street, London, E.C.: April 23, 1895.

Dear Sir,—I beg to enclose copies of correspondence which has passed between Messrs. Spalding & Cross and myself since my letter to you of the 2nd inst. relative to the distinctive mark upon their perspective drawing submitted in the above competition.

You will see that I have failed to obtain from them a direct reply to a very simple question arising from a statement made to me when last I visited Manchester.

I presume you have been away from town, which would account for the absence of a reply to my letter of the 2nd inst. I hope and indeed think I am not exceeding my rights as a competitor in asking you to elucidate a matter which in its present phase is far from satisfactory, and I shall be much obliged if you will let me hear from you upon the various questions raised in relation to the subject of my letters at your convenience.—I am, dear sir, yours faithfully,
(Signed) ERNEST RÜNTZ.

Alfred Waterhouse, Esq., R.A.

20 New Cavendish Street, Portland Place, W.:
April 25, 1895.

Dear Sir,—I have, as you surmise, been away from home, and have only just returned to town. You will readily understand that an assessor hardly feels himself bound to answer all the letters that he may receive from competing architects, and, further, I did not consider that your letter of the 2nd required a reply, for I believe I had before informed you that I did not observe any distinguishing mark on Messrs. Spalding & Cross's design. If I had noticed such a mark, and thought it was there for the purpose you intimate, I should have rejected the designs. Your other question I hardly think it necessary for me to answer. The cost of a building is, of course, one of the most important points an assessor in an architectural competition has to give his attention to, but he cannot give any sort of guarantee that the designs he may select for prizes will be built within their authors' estimates, nor even within his own, the development of the design preparatory to obtaining tenders for its execution resting not with the assessor but with its author, and I hear that the building in question has been added to and altered in a variety of ways since the competition.—Yours truly,
(Signed) A. WATERHOUSE.

Ernest Rüntz, Esq.

NEW BUILDING.

Cardiff.—On Saturday last Lord Tredegar opened the new Children's Home at Roath, Cardiff, which has just been completed for St. Margaret's Sisterhood, East Grinstead. The Bishop of Llandaff performed a short dedicatory service in the presence of the Reverend Mother Superior and a large gathering of the clergy and laity of the neighbourhood. The new buildings stand on a site half an acre in extent, adjoining St. Margaret's House of Mercy, the freehold of which has been very generously given by Lord Tredegar. The design is plain and unpretentious, in a modern Domestic style, Gothic in feeling, architectural effect being obtained by the judicious

admixture of Bath stone and Ruabon red pressed brick dressings, with moulded brick strings and cornices, and Maesy-cymmer stone shoddies for the facings. A sculptured figure in Portland stone, representing St. Margaret, by Mr. Wormleighton, of Cardiff, is placed in a niche in the front elevation; and the same artist has executed the bold incised work in the cement panels of the half-timbered centre gable. Accommodation is provided for thirty children. On the ground floor are provided spacious entrance hall, with waiting-room, sitting-room, work and play rooms, and refectory, with storeroom, kitchen, scullery, larder, and the usual offices. There is a small laundry attached, consisting of washhouse and ironing-room, both spacious, airy and well ventilated. A side entrance is provided for the children, with lavatory and cloak-room attached, and there is also a separate entrance to the laundry and a covered way uniting the home with the private chapel connected with the House of Mercy. On the first floor are two large dormitories, with attendants' bedroom between, guest chamber, bathroom and small infirmary, which can be isolated in case of necessity. On the second floor are two large dormitories for the elder girls on the cubicle system, each cubicle having a separate window, and through ventilation is obtained by windows reaching to the ceiling at either end. There is a bedroom for the sister-in-charge, and also a bathroom, linen-closet and storeroom on this floor. The buildings have been carried out at a cost of about 2,300*l.* by Messrs. Shepton & Son, of Cardiff, from designs and under the personal superintendence of the architects, Messrs. Veall & Sant. Mr. Wm. Beese was contractors' foreman. The tiles for floors were supplied by Wooliscrofts, Hanley; the grates by John Williams & Sons, Cardiff; the tile-hearths by Godwin, Lugwardine; and the lead lights by Mr. S. Evans, West Smethwick. The buildings form a valuable addition to the sisterhood's establishment at Roath, especially in the concentration of the admirable rescue work which has been going on here for the last thirteen years under the careful supervision of Sister Esther.

GENERAL.

Plans have been prepared by Mr. T. G. Abercrombie, architect, of Paisley, for the proposed new infirmary at Paisley.

An Amateur Art Exhibition, organised for charitable purposes, was opened by the Duchess of York on Monday afternoon, at Moncorvo House, Ennismore Gardens.

The Indian Government have ordered a massive granite obelisk, which is to be erected over the remains of the British officers who were the victims of the Manipur massacre.

Sir John Millais's picture, *St. Stephen*—a prominent feature in the Royal Academy Exhibition—has been bought under the regulations of the Chantry Bequest by Mr. Tate, who has consented to lend it at Manchester, to be shown at the autumn exhibition.

The Government have commissioned Mr. Thornycroft to execute a large statue of Cromwell. The statue will probably be placed at Westminster.

Papers will be read at the meeting of the Royal Meteorological Society on Wednesday, the 15th inst., by Mr. G. J. Symons and Mr. G. Chatterton, on "The November Floods of 1894 in the Thames Valley."

A Memorial Fountain in honour of Sir Charles Cameron, M.P., is to be erected on a site in Woodside Crescent, Sanchiehall Street, Glasgow. It will cost 600*l.*

The Death is announced of ex-Provost Brown, of Paisley, who was connected with the Society of Antiquaries of Scotland, and wrote several historical works on Paisley and the district.

The French Government have purchased Mr. Brangwyn's painting, *A Market on the Beach*, which is now being exhibited in the Salon.

Lord Egerton of Tatton has decided that the anniversary festival of the Royal Masonic Institution for Boys will be held on July 3. The annual sports will be held at Kempton Park on June 8.

The Bells of Crowland Abbey, Lincolnshire, where it is recorded that the first peal of bells was ever rung in England, have been rehung.

A Roman Well was discovered during the building operations on the site of the Roman Camp, Segedunum, at Wallsend.

Captain Abney, C.B., will read a paper before the Society of Arts on next Wednesday, his subject being "Means for Mitigating the Fading of Pigments."

The Bequest of 1,000*l.* by the late Captain Macdonald for the erection of a monument in Inverness in memory of Flora Macdonald, who aided in the escape of the Pretender, has now been placed on deposit to the credit of the Town Council and the trustees of the deceased, Mr. Justice Stirling having pronounced the bequest to be valid.

The Architect.

THE WEEK.

THE position of the works committee of the London County Council is at present rather dubious, since the following motion was rejected at the meeting on Tuesday:—"That in the cases in which the actual cost of the works has exceeded the original or amended estimates the amount expended in connection with the works be approved; and that the works committee be instructed to prepare and bring up a report to the Council making suggestions for preventing estimates being exceeded in future, and do also report forthwith the particulars of the jobbing works done during the existence of the committee, together with the values placed upon such works by the officer under whose orders and directions such jobbing works have been carried out. That the Council, having considered the report by the architect on the statements affecting his department contained in the report of the manager of works, finds no reason for attributing to the architect or his department any responsibility for the increased cost of the buildings erected in Yabsley Street and Blackwall Lane." The natural consequence of the defeat should be to withhold the entrusting of additional works to the committee. But by one of those volatile transitions which betray the weakness of the Council as a governing body, it was immediately afterwards decided to allow the works committee to erect a block of dwellings on the Boundary Street area. The committee are not hampered in any way about the cost of the building, and the ratepayers must therefore expect to have to pay an exorbitant price for the privilege of possessing amateur contractors and a body of idle workmen who will not obey orders.

THE late Mr. JAMES PIERS ST. AUBYN, who died last week at Marazion in his eighty-first year, enjoyed more than a local reputation as an architect. As he held the office of surveyor to the Middle Temple for over thirty years, it is evident that his reputation had extended to the Metropolis. By birth he was a native of Worcestershire, for he was born in Powick, of which parish his father was vicar. In Devon and Cornwall he was much occupied with church building and restoration. He erected also several mansions, which were equal to any contemporary work of the class. The restoration and enlargement of the buildings on St. Michael's Mount were carried out by him. Since Mr. ST. AUBYN took up his residence in Marazion, he busied himself with local government, and he filled several honorary offices. He was an excellent type of the provincial architect.

ON Tuesday there was a meeting of the museum building committee of the Cardiff Corporation, when the subject of appointing an architect was considered. It will be remembered that some controversy arose on the subject. Mr. EDWIN SEWARD, of Cardiff, was consulted by the committee, but the architects of the town and district were eager to have an open competition. A memorial from the Cardiff, South Wales and Monmouthshire Architects' Society was read on Tuesday, in which it was suggested that unless they had already pledged themselves to any architect, the committee should invite public competition for the business of the museum buildings proposed to be erected in Park Place, the competition to be under rules of the Royal Institute of British Architects. A letter from Mr. EDWIN SEWARD was also read, in which he asked the committee to take into consideration some facts relating to his connection with the project. In the designs he made in competition fifteen years ago, the museum, and especially the art gallery of Cardiff, had their origin, but with the disadvantage that the conditions relating to cost and space could not be adequately represented. When, after ten years, extensions were resolved on, he asked for the opportunity of preparing designs which might at length do better justice to the

institutions concerned. Such plans as then appeared suitable were produced in consultation with the committees and the officials. In respect to the museum and art gallery, the best attempts made appeared to give clear indication of the undesirability of continuing that institution in an extended storey above the library building. A change in the constitution of the museum's financial resources allowed it to be detached from the library. More than three years had thus elapsed before a tangible issue was obtained, during which he followed up and defined the various changes of idea and intention as they arose. Finally, he redrew and revised the plans and details previously brought to a complete stage, also preparing new bills of quantities for erecting the present library building. To that building he had gladly devoted attention of a kind in which neither time nor cost to himself were considered, as his share towards assuring for it a useful and interesting place among the libraries of the kingdom and the public buildings of Cardiff. In reference to the Museum, he was prepared to carry it forward whenever the Corporation might again be ready. He had also visited the leading art galleries and museums of England, and those of Rome, Florence, Naples, Antwerp, &c. He hoped that the change of policy as affecting the museum site did not carry with it a change of policy in respect to the architect. The Mayor proposed that Mr. SEWARD be retained as architect to the committee for the new building. He said he had had considerable experience of Mr. SEWARD's work, and if there was no legal claim upon the committee to appoint him there was a moral claim which ought to guide them. He wished, as Mayor of Cardiff, to give proper effect to this motion, to have the proposal of it. The motion was cordially supported, one of the committee saying that Mr. SEWARD was well acquainted with the class of work, having taken a very deep interest in all matters connected with museums and art galleries. The committee would have as good work done by him as by any architect whom they might appoint. The resolution was carried unanimously subject to the confirmation of the Corporation. It was also resolved that the memorialists be informed that the committee felt itself morally pledged to retain Mr. SEWARD as its architect. "All's well that ends well," and it is to be hoped there will be no longer any friction between the successful and the unsuccessful aspirants for the work. The sum available for the museum is 12,000*l*.

AN action brought by Mr. ROBB, a Belfast merchant, against Mr. J. J. FARRELL, architect, Dublin, was settled in the Rolls Court on Tuesday. The plaintiff sought for an injunction and for damages in respect of interference with his rights of light by the erection of a new Empire Theatre of Varieties in Belfast, of which the defendant was architect, and at the time owner. The terms of the arrangement were that the action should be stayed on the defendant paying to the plaintiff 900*l*., each party abiding their own costs; the settlement to be without prejudice to further proceedings should there be any future interference with the plaintiff's rights.

SEVERAL French artists have been admitted to the Legion of Honour or advanced to a higher rank in it, ostensibly for upholding the reputation of their country in the exhibitions of Lyons, Antwerp and St. Petersburg. M. BESNARD and M. MAIGNAN, the painters, have become officers. Joined with them is another painter, M. POILPOT, whose numerous panoramas have gained fame elsewhere than in France. M. LANSON, the sculptor, and M. JACQUET, the engraver of medals, are also officers. To the Chevaliers the following painters have been added, viz. MM. BARAU, BARILLOT, BEAUVERIE, DAUPHIN, MARAIS, JEAN MONCHABLON, MUENIER, NOZAL, PÂRIS, RENAN, RENARD, SAIN, VAUTHIER. The sculptors are MM. BARTHOLOMÉ, ISIDORE BONHEUR, SUCHETET. The architects are MM. DEGLANE, VAUDOYER. In addition are MM. DESBOUTIN, LALAUZE, engravers; M. DIOMÈDE, a sculptor on precious metals; M. GRANDHOMME, painter on enamel; MM. GRASSET and LIBERT, painters and designers; and M. MARIOTON, an operative sculptor.

PAINTING AT THE ROYAL ACADEMY.—II.

THE most remarkable work in Gallery V. is *The Drummers*, by Professor VAN DER OUDERAA, of Antwerp. It represents a street in a Flemish town when some State procession took place, probably in the time of the Spanish domination. The drummers are clad in a creamy white uniform with scarlet stripes, and they carry old-fashioned and cumbrous instruments. They are mostly young men who are not apparently proud of their office, but the leader evidently considers himself to be at least equal to the marshal of the ceremony. The scheme of colour is novel, the figures are excellent and subtly characterised, and the scene is a sort of old-world revelation. Near it is a vivid portrait of *Mrs. Sidney Dicksee*, by Mr. T. F. DICKSEE, which in execution is superior to some of those which have gained more admiration. M. ALBERT NEUHUYS'S *Dutch Interior* would, without the catalogue, be ascribed to M. ISRAELS, and it will sustain comparison with one of that master's works. The *Isles of the Sirens*, by Mr. J. BRETT, differs not merely in title from preceding seascapes. The sea is more suggestive of a flowing motion, the craft appear to move, and there is a less expanse of stippled work. The artist's other pictures are proofs that he has at last accepted advice, and is not restricting his undoubted ability to one class of subject. His "new departures" are most promising, and Mr. BRETT deserves to be encouraged. Mr. RALPH HEDLEY'S *Old Pension Day* is pathetic, and the artist has contrived to express a scene of military life without the aid of regimentals, with the exception of an orderly clerk. There is no exaggeration, for even the paymaster appears sympathetic. *The Smithy*, by Mr. STANHOPE FORBES, is equal to his *Forge*. Often as the subject was painted, we doubt if ever the characteristics were better rendered. In this case we see not only labour which has to be expeditious, but that peculiar listlessness which it seems to provoke as a sort of compensation. It is a pity the picture cannot be hung beside the *Reverie* in the first room, in order to suggest the difference between illumination that is made an auxiliary, as it should be, to form, and illumination that is created for an occasion and is not worth the trouble of preparing, much less of representing. Mr. DAVID MURRAY has two of his four landscapes in this room, *In Summer Time* and *Kennet and Avon*. Like his other works they do not appear to be composed, but rather as transcripts from nature, and accordingly they are among the pictures which are worth looking at a second time. Mr. SYDNEY P. HALL is better known from his works in black and white than in colour. His *Vivâ Voce Examination in the Old Schools, Oxford*, is excellent from the way in which the uncertainty of the student's answers is suggested. The youngest examiner, as befits one who has lately gone through the ordeal, is arrogant with the assurance of knowledge. Next to him is an older man, who cannot make out the mumbled replies, while the remaining examiners are somewhat puzzled. The concealed wringing of the student's hands reveals the strain he is undergoing. The lighting of the picture is one of its best qualities, and although colour has to be absent from so academic a scene, there is no lack of relief.

Every visitor who proposes to make a round of the rooms would do well to glance on passing the turnstile at Mr. H. HERKOMER'S *The Burgomaster of Landsberg, Bavaria, with his Town Council*, which, with the aid of the lines offered by the central hall and the vestibule, produces a sort of effect like that of a panorama. That may not be entirely legitimate, but from such a point of view alone is the picture satisfactory. Anywhere else the devoting of over a hundred and fifty square feet of the limited wall space of Gallery VI. to a collection of nobodies, who are penned in enclosures which are too small to contain them, would be a surprise; but, as everybody knows, the Academy walls belong to the members, and it is only on sufferance that works by outsiders are tolerated. The picture may be truly described as sensational, but the worshipful councillors are vigorously painted, and the glimpse of the town through the windows is pleasing. Over it is another big picture of a different character, *Crossing the Red Sea: Pharaoh pursuing the Israelites*, by the American painter, Mr. F. A. BRIDGMAN, which apparently is a decorative work, and, we suppose, for a position

where subdued colour is necessary. In that respect it differs from the painter's smaller works, which have all the colour demanded by Eastern scenes. The composition is dramatic. The Israelites are not visible, but the figures of the Egyptians suggest that no insignificant enemies are before them. They have the care in the modelling which was to be expected from one of M. GÉRÔME'S pupils. It is not often pasture is employed so near the coast as appears in Mr. P. R. MORRIS'S *Storm on Albion's Coast*, but, assuming that condition, the picture is most impressive, and the inability of the sheep to combat with waves and winds without the care of the shepherd and his dog is manifest, and gives a character to the scene which, without the figures, would be absent.

Mr. J. W. NORTH has forsaken the manner which was exemplified in his water-colour drawings. *Fruition: England* in Gallery VII. shows fruit trees instead of tangled hedges, and the mass of leafage and blossom makes the title appropriate. A *Bayswater 'Bus* may appear a commonplace subject, but Mr. G. W. JOY has introduced four or five figures that are comely, but they suffer from the proximity of the hideous advertisements. There is no effort to make remarkable contrasts, which is generally the drawback in similar scenes.

There are a few good pictures in Gallery VIII. If *Suscipe me, Domine*, is not exaggerated, the reception of a nun is a survival of Mediævalism that has little changed. The dramatic action of the novice possibly does not follow the rubric any more than the architecture corresponds with an existing building, but with less emotional display the sacrifice would not be so manifest. The figures of ecclesiastics, servitors and the nun's relatives are characteristic. No wonder the scene is fascinating to young ladies, for it is more brilliant than a fashionable wedding. The variations which religious influences exhibit is suggested by the neighbouring picture, the *Youth of Ulysses*, by Mr. H. J. DRAPER. It shows the Ithacan prince lying on the ground in the presence of the azure-eyed goddess who bears the spear with which she levelled ranks of heroes. The boy is no doubt enjoying his visions of future victories. It is hardly a paintable subject, for what painter could realise HOMER'S description? A scene like *Sanctuary*, by Mr. H. G. RIVIERE, where the goddess appears not as a vision but as a statue in a temple to which some Greeks have fled, shows a more accurate notion of the boundaries of poetry and painting. Mr. G. E. ROBERTSON'S *Mark Antony's Oration over the Body of Caesar* is not a reproduction of a scene on the stage. He has selected the moment when ANTONY has descended from the "pulpit," and has consequently sacrificed effect in order to express the triumph of the orator in moving the populace to mutiny. Although Mr. COLLIER has still his weakness for toxicology (on canvas), his *Death of Albine* presents as pure and gentle a girl as could be imagined. The simplicity of the work denotes a development of the artist's imagination, which should enable him to create much better work than is to be derived from the byways of history. The *Joan of Arc*, by Mr. G. W. JOY, in which the heroine is seen in armour, lying on straw, is a fitting comparison to it. Mr. FRANK BRANGWYN'S *Rest* might be a *Flight into Egypt*, only the figures are not conventional in the sense of imitating Italian masters. They are not beautiful or refined beings, and the work will, by most people, be taken as a pictorial freak; but it cannot be passed by, and when once seen cannot be forgotten.

Gallery IX. rarely receives much attention from the crowd. As the President has two of his works in it, and as it contains Mr. Gow's and Mr. Woods's diploma works, besides contributions from other Academicians and Associates, it may thus escape neglect. As a collection of cabinet works, it offers a means of enjoyment less obtrusive than the collections in other rooms, but no less genuine.

Gallery X. too often appears like a refuge for pictures whose acceptance was at one time doubtful. This year it contains one of Mr. SOLOMON'S mythological efforts, *Echo and Narcissus*. There is nothing statuesque about the picture; the love-lorn nymph is a modern beauty and the hunter is a fool whose admiration of himself is ridiculous. M. VAN DER OUDERAA'S *Jewel Cloister* is elaborated like some modern Belgian works, which in that respect appear to be survivals of the earlier Flemish manner. Mr.

MURRAY'S *Thistledown* shows a plain partly in bloom and partly with open spots, where sheep are collected, with low hills towards the horizon. There is another treatment of the subject seen in Mr. SCHOFIELD'S picture. Mr. BULFIELD'S *The Last Hour* is a deathbed scene, with a Catholic priest giving communion to the dying man. It shows not only skill in painting a humble interior dimly lighted, but a reverential spirit, without which the subject would become degraded.

The two best pictures in Gallery XI. are opposed. Mr. ERNEST NORMAND'S very large *Bondage* has some claim to be considered the picture of the year. There is no unusual imagination in it, for it simply represents a display of fair and dusky captive girls by a slave-dealer before an Egyptian king, and it is not inspiring. But those characteristics are general this year, for it is only the landscape which can excite an emotion. What other painters have attempted on a small scale Mr. NORMAND offers in quantity, and he has painted his nude forms in a manner which makes them pre-eminent. Such a scene could hardly be observed in the time of the PHARAOHS, but at a later period there was more likelihood. The artist wished to paint a showy and grandiose subject which would allow him to display varied abilities, and the public have reason to be thankful. Heavy as was the task assumed, there is no sign that Mr. NORMAND was not equal to it, for the picture appears to have been painted with ease. Opposite is Mr. CATON WOODVILLE'S *Charge of the Light Brigade*. Factitious legends have brought that event into disrepute, and, moreover, it must always be painful to remember that brave men were sacrificed by the incompetence of a mountebank like Lord CARDIGAN and a lunatic like Lord LUCAN. A painter must be courageous who revives the subject. The appearance of Lord CARDIGAN must always bring doubt on a picture, and he might well have been omitted, for his regiment, the unlucky 11th Hussars, is only represented by himself. The enemy is not seen, but their power is apparent by the falling of men and horses. By restricting himself to a limited number of troopers the artist is able to impart individuality to them, and more interest can therefore be taken in this work than in the majority of battle-pieces. Mr. WOODVILLE'S skill in representing men and horses in action was demonstrated several years ago, but in none of his works is there so consistent a scheme of colour as we see in this year's picture. Lady BUTLER, in *Dawn at Waterloo*, has painted "the *réveille* in the bivouac of the Scots Greys on the morning of the battle." On such an occasion discipline is tested, for even the damp ground as a bed can have its attraction. Officers and men are scattered over the ground allotted to them, and there is a good deal of variety seen in the reception of the summons. The incident is clearly portrayed, and the picture will make a popular plate.

It cannot be said that the Academy is neglectful of water-colour art this year, for there are about two hundred and thirty drawings. Among them are many excellent landscapes and figure-pieces. This part of the exhibition is too much neglected. There are, too, about a hundred and fifty miniatures, thus showing that, in spite of photography, there are patrons for an old-fashioned form of art. The Black and White Room contains examples of engraving and some admirable portrait drawings.

SCULPTURE AT THE ROYAL ACADEMY.

IN this year's Exhibition Mr. HAMO THORNYCROFT dominates among the sculptors. By a sort of inevitable law every sculptor in this country is expected to be a portraitist, and Mr. THORNYCROFT is usually successful with work of that class. His full-length statue, *The late Earl Granville, K.G.*, appears to represent the Minister as listening to some argument or attack which it was his business to turn aside by one of his genial replies. His lordship appears in evening dress and wears the broad ribbon of the Garter, as well as a tie which, if in white, was modelled on the familiar blue one which the Earl preferred to all others. The difficulty of making a presentable figure offered by such a costume, which above most others recalls SHAKESPEARE'S "forked radish" as a definition of man, is in part overcome by placing a little pedestal at one side, on

the top of which sheets of paper rest, Lord GRANVILLE having one hand on them, and which also supports a piece of drapery that is brought to the ground. The other hand contains a document. The figure stands alert, and expresses a reserve of energy and good-humour with a becoming sense of responsibility. Lord GRANVILLE'S face was almost as difficult to treat as JOHN BRIGHT'S; it was not heroic, and years spent in leading forlorn hopes in the House of Lords only augmented the kindness of the expression. That Mr. THORNYCROFT has been able to produce so agreeable a figure with such material is almost as strong testimony to his powers as his statue of *Gordon*. The two busts, *Sir George Williams* and *James Chance, Esq.*, are also well characterised.

There cannot be much variety in recumbent statues, especially when they represent figures lying on their backs and clad in the rochets which, as a specialty of English robemakers, do not fall in as graceful folds as Greek drapery. The Italian artists of the Renaissance were not fettered in that way. There was not only a choice of robes and vestments in which the subjects could appear, but it was allowable to represent the prelates in a variety of ways. A bishop might lie on his back or on his side, he might appear as giving a final charge to his clergy, or be attentively listening to his confessor's discourse. As a consequence the episcopal monuments are of numerous types, and it is easy to recall a great many of them. But of late years recumbent figures of bishops have grown so common and they are so much alike it is not easy to discriminate between them. The division into bishops with wigs and bishops without wigs used to serve, but it is now no longer applicable. Mr. THORNYCROFT, in his *Right Rev. Harvey Goodwin, Bishop of Carlisle*, has adopted the Italian precedent of introducing a couple of amorini to support the bishop's head, and he places a mitre at his feet. So much unreality lowers the solemnity of a monument. We must suppose the sculptor has had a mask to work from, but Dr. GOODWIN must of late years have acquired a pugnacious expression which was not his when he left Cambridge.

The plaster model of a dancing-girl, *The Joy of Life*, is Mr. THORNYCROFT'S most remarkable work. In it we see rebellion against ancient precedents as well as CANOVA'S masterpiece. The dancer is not reposing, or if so it is for a moment the duration of which is not to be measured. Standing on the toes of one foot, the other leg is raised and about to fall into a new position. The muscular action could hardly be more definite if represented by a cast. One arm holds lightly the edge of the skirt; the other is stretched out to aid the equilibrium. The head is bent, with the eyes cast down, which indicates that the girl is either a novice or attempting a new *pas*. The drapery is not that adopted on the stage or seen in rehearsals. There are, in fact, two skirts, which give a very great variety of folds, offering contrasts in the lines. It is a daring experiment, and the sculptor has succeeded in what he aimed at.

In art there cannot be canons, unless by a tacit agreement among those who practise and those who judge concerning their principles. The history of sculpture reveals that progress was accompanied by a recognition of the restrictions offered by materials. Attached drapery of metal or textile fabrics was abandoned, so was colouring. The rigidity of stone and marble was accepted as prescribing repose. But that did not signify an inanimate appearance. As FALCONET, the French sculptor in the last century said, "Sculpture should not be satisfied with a cold resemblance, and such as man presented before he was animated with the breath of life. That sort of exactitude, however well rendered, can only excite praise that is no less chilling. What the sculptor should express in marble, bronze and stone is nature that is alive and passionate." The last words might be supposed to encourage the production of figures apparently in motion, but FALCONET was not ambitious to see the painter's territory invaded. His contemporary REYNOLDS, who was no less catholic in his taste, also entered a protest against "the folly of attempting to make stone sport and flutter in the air," which carried with it its own reprehension, and which was one of the consequences of an effort to suggest movement. There are, however, signs enough that the rules which were accepted in a past age are no longer held to be binding. Mr. THORNYCROFT may say that in his

Diana and other classic figures he has duly respected precedents; why should he not endeavour to enlarge the sphere of his art? *The Foy of Life* is modern from head to toes. It is as phenomenal as ZOLA'S *Joie de Vivre*, and if one production has attained success why should not the other?

The principal work of Mr. THOMAS BROCK is his full-sized model of the statue of the late Sir RICHARD OWEN, which is to be placed in the Natural History Museum. The naturalist's discoveries are now supposed to be out of fashion, but he was instrumental in forming that museum, and although OWEN was hampered in his conclusions by a respect for orthodoxy, he was the legitimate successor of CUVIER. His head was admirably adapted for a sculptor's use, for there was no flabbiness in any part. Mr. BROCK'S success in catching a likeness is, therefore, not surprising. OWEN wears an academic gown which imparts dignity to the figure. He is represented standing, and as using a bone as a subject for his lecture. That, like CUVIER, he could construct a skeleton out of a single bone or a fragment of one is a historic fact, but as the most important of his deductions related to the spine and its development, it would have been preferable to have suggested in some way the foundation of his reputation. The committee are, we suppose, responsible for the selection rather than the sculptor.

Mr. ONSLOW FORD is at his best when working in bronze, and his heads, *W. Q. Orchardson, R.A.*, and *Briton Rivière, R.A.*, are emphatic likenesses. Another vigorous bust is Mr. ARMSTEAD'S *Augustus Mordan, Esq.* It is an advantage sometimes to have a different form of portraiture, and Mr. FRAMPTON'S *Mother and Child*, apparently a portrait group in high relief, has therefore much to recommend it, although the mother is only a bust while the child is full length. His *Music and Dancing*, two panels in low relief for a cabinet, are interesting examples of decoration which should have an influence on the furniture market. Mr. POMEROY has a sketch medal of a long frieze for the Sheffield Town Hall, which is representative of *Labour*. He has adopted the plan of avoiding gaps between the numerous figures, and the effect will be very rich and animated. But to execute the work properly will therefore be costly, and we trust the authorities will not be niggardly or endeavour to alter the character of the work for the sake of some small saving. There is "go" enough about Mr. SWAN'S *Orpheus*, but it may be doubted whether a Greek who ought to know something of the subject would agree that so much impetus and strain of the whole body were necessary in order to make the lyre express sweet sounds. Sculpture has not yet gained a hold on the public, and it is most creditable to the artists that this year's display is so satisfactory. Ability exists, patronage alone is needed, and with its aid, *pace* M. ROCHEFORT, England might yet surpass his countrymen in sculpture as, according to his acknowledgment, they have done in painting.

DURHAM CATHEDRAL.

A SPECIAL meeting of the Durham and Northumberland Archæological Society has been held to examine the discoveries in Durham Cathedral. The members assembled in the nave, when a short address was given by the president, the Rev. Dr. Greenwell, on the history of the building of the cathedral. He said there were few buildings in England where they had so many ascertained dates to go upon. To every part of the building they could fix a precise date. Durham, he said, was quite a late place compared with some of the ancient cities of England, such as Chester and Lincoln, which were in existence in Roman times. Discoveries they had made pointed to a Roman occupation at Durham, but it was only of a trifling character, and not a great settlement like those of Lanchester and Chester-le-Street. Proceeding, Dr. Greenwell told of the origin of the church at Durham. It had, he said, its origin at Lindisfarne, and without Lindisfarne there would have been no Durham. Driven from Lindisfarne by the invasion of the Northmen, the pious monks came to Chester-le-Street, and after an interval of wandering to Durham, Aldhun commenced to build his church at once, and in 899 finished it. He fancied Aldhun's church would occupy the site of the present nave of the cathedral, and he had no doubt but that careful excavation would reveal the whole of the ground plan of the original church built by Aldhun. The Bishop of Durham after the Conquest was Walcher, who reigned from 1071 to 1080, and afterwards

in 1081 they had the great Bishop William, or St. Carileph, who established the Benedictine monastery at Durham. At first Aldhun's church was used for the purposes of the monastery, but in 1093 he determined to build a new church of larger dimensions and one worthy of the great monastic house he had established. On August 11, 1093, the foundation-stones were laid, and although there were differences of opinion as to how far the building of the church had proceeded when Carileph died, he was of opinion that Carileph practically finished the whole of the church up to the first sub-bays of the nave, with the exception of the south transept and the roof of the north transept. These were done by the monks in the interval between Carileph and Flambard. The latter bishop finished the nave up to the groining, so that in 1128 they had the whole of the church completed with the exception of the roof of the nave. It had been questioned whether the stone-groined roof of the nave was of that early period, but he himself saw no difficulty in the matter, and the stone-groined roof erected in the early part of the twelfth century, and the first of its kind in England, was only in consonance with the general splendour of the building. Durham Cathedral was a building of great magnitude; it was a building showing wonderful skill—architectural and engineering skill. There was no Norman architecture to be mentioned alongside it; all others paled beside it. Continuing, Dr. Greenwell spoke of Bishop Pudsey as a great builder. He built the Galilee Chapel, which was a beautiful specimen of Transitional work. Afterwards the speaker dealt with the building of the Nine Altars by Bishop Farnham, this superseding the apsidal east end built by Carileph, which was said to be in a ruinous condition. The introduction of the Nevill screen followed and the building of the bishop's throne, the latter in the time of Bishop Hatfield. There was, he said, no such throne anywhere in England, and that was due to the fact that it was a palatinate and not an episcopal throne. Having spoken of the cloisters and the building of the monastery kitchen and other parts of the monastery, Dr. Greenwell brought an interesting address to a close.

In the afternoon the members again assembled in the nave of the cathedral, when Mr. C. C. Hodges, of Hexham, delivered an address upon the architectural features of the church. Afterwards the members examined the recent discoveries at the east end of the cathedral, through which Carileph's apsidal east end has been disclosed. This concluded, a visit was paid to the newly-restored chapter-house, the work having been carried out as a memorial to the late Bishop Lightfoot.

THE ROYAL SOCIETY OF BRITISH ARTISTS.

THE Royal Society of British Artists has given effect to a resolution adopted last year, to so increase the number of members as to enable the Society permanently to hold one exhibition annually of the works of members only. The announcement was made last season, with the result that 117 artists sent in their names as candidates. At a general assembly held on the 6th inst., the following were elected:—John Aborn, J. Noble Barlow, Francis Black, Arnesby Brown, Leicester Burroughs, Charles Collins, C. H. Eastlake, Walter Fowler, Windsor Fry, E. Gouldsmith, Robert Hume, T. Ireland, Burrough Johnson, J. E. Jacobs, S. M. Laurence, W. Luker, jun., Fred Milner, T. E. Mostyn, Greville Morris, J. W. Parsons, Graham Robertson, Harry Stannard, J. Sanderson Wells and W. Tatton Winter. The Society will hold another election in the autumn.

THE PARIS EXHIBITION OF 1900.

THE Paris correspondent of the *Times* writes:—"The plan of the exhibition of 1900 will be considered in a few days by the Supreme Commission, and will be submitted to Parliament at the beginning of July. The cost is estimated at 60,000,000 francs. The grand entrance will be at the Place de la Concorde, but the Champs Elysées gateway will be at the extremity of a broad avenue lined with statues and colonnades and leading to the new Invalides Bridge over the Seine. To the right of this avenue will be the marble Palace of Fine Arts, which is to supersede the Palace of Industry, and will be a permanent structure. To the left will be a smaller permanent building devoted to the art of the past. The French textile exhibits will occupy the Invalides esplanade, while along the river on both banks between the Invalides and the Alma bridges will be a series of buildings for foreign exhibits, the congresses, flower shows, &c. The army and navy exhibits will be a little lower down on the south side. The food, transport, mechanical and chemical sections will occupy the Avenue de Suffren side of the Champ de Mars, while on the Avenue de la Bourdonnais side will be the literary, scientific, artistic, dress, mining and metal sections. The electricity building will

connect these two wings, while the centre of the Champ de Mars will be devoted to fountains and flower beds. The festival hall, with agricultural exhibits on each side, will be behind the electricity building and in the centre of the machinery building. Colonial industries, products and dwellings, with their inhabitants, will occupy the Trocadéro Gardens. Altogether, without any attempt to vie with Chicago in area, the exhibition will be sufficiently different from its predecessors to present the charm of novelty."

CRYSTAL PALACE AWARDS.

THE following medals for paintings exhibited at the Crystal Palace have been awarded by the judges, Messrs. J. B. Burgess, R.A., Phil Morris, A.R.A., and Alfred East:—*History or Figure Subjects*.—A Night School, Edgar Bundy (gold medal); "1793," the Eve of the Noyades, T. Blake Wirgman; A Ploughing Match, W. B. Fortescue; A Legend of Provence, Miss J. L. Gloag; Marooned, Percy R. Craft. *Landscapes, Sea-Pieces, Animals, and other Subjects*.—Many Waters cannot Quench Love, J. Walter West (gold medal); The Music of the Eager Pack, John Charlton; The Golden Duono, Pisa, Wyke Bayliss; Under the Lindens, George C. Baité; Gélert, W. Frank Calderon. *Water-Colour Drawings, irrespective of Subject*.—Recruiting for Savonarola, F. W. W. Topham (gold medal); Evening Mists—Derbyshire, Harry Stannard, jun.; Mumbles Lifeboat Rescuing Crew, Edwin Hayes; The Falconer—a Good Day's Sport, John Scott; A Corner of the Studio, C. A. Smith. *Works by Foreign Artists*.—*History or Figure Subjects in Oil*.—The Christening, O. Daupheimer, gold medal; Charge of Cuirassiers, C. Bomblé (silver medal); What is pleasure to one is sorrow to another, J. Kleinschmidt (silver medal); A Turkish Sweet-seller, Simon Sabides (silver medal); Evasion, Alfred Paris (silver medal). *Landscapes, Sea-Pieces, Animals, and other Subjects*.—In the Forest (Autumn), Professor C. Kröner (gold medal); A Village Street in Bavaria, Otto Ahrweiler (silver medal); The Shepherd, E. Meissner (silver medal); Market-place in Capri, Ferd. Brüll (silver medal); Indian Village in South Africa, Will Kuhmert (silver medal).

ARCHITECT'S FEES.

IN the Hull County Court Mr. George Thorpe, architect and surveyor, of Hull, sued Thomas Leeson, builder, of Hull, for 21*l.* 10*s.*, charges for preparing plans and bills of quantities in connection with a building. The case for the plaintiff was that in the early part of 1894 he was asked to prepare plans for land about to be purchased by the defendant. The defendant provided the plaintiff with a draft outline of what he required. Ultimately a sketch plan was prepared by the plaintiff, and the defendant was informed that the cost of the building would amount to about 400*l.* The defendant was advised before entering into a contract for the purchase of the land to have plans prepared and submitted to the works committee of the Hull Corporation. This was agreed to, and the plaintiff was instructed to prepare and submit the plans, which were subsequently approved by the Corporation. Whilst negotiations were going on the plaintiff was instructed to prepare drawings and specifications, and also asked what his estimate of the cost would be. It was agreed that the terms should be 5 per cent. on the outlay should the work proceed. From time to time, however, these plans were added to, which materially increased the cost of the proposed building. When the specifications were shown to one or two builders in Hull, with a view to tendering, it was found that the estimate was too low, and that they would require bills of quantities. On this point the action was to be fought. The agreement was that 1 per cent. on the lowest tender should be paid if the job did not come off in reference to the bills of quantities, and plaintiff had only claimed 2½ per cent. on the proposed outlay, which was very reasonable. The plaintiff was entitled to a fair remuneration for services rendered. The defendant had paid something into Court, showing that he was liable for something.

The plaintiff, being called, denied in cross-examination that it was in consequence of his estimate being so much below the tenders that the bills of quantities were required. He was certainly instructed to prepare the bills of quantities.

For the defence it was contended that the amount paid into Court, 10*l.* 10*s.*, was sufficient to meet all the claims of the plaintiff, viz. 2½ per cent. on the first estimate of 450*l.*, and that he was not entitled to the remainder of the claim, because it was in consequence of his estimate that bills of quantities were required, and that they ought not to be paid by the defendant at all.

His Honour gave a verdict for the plaintiff for 15*l.* 10*s.* including the amount paid into court, and costs.

TESSERÆ.

Early Italian Art.

STYLE and subject are sometimes confounded with each other by writers, and in ordinary conversation nothing is more common than this mistake. In regarding early Italian art, it is of great consequence that we consider its distance from nature not as a departure from her, but as the nearest approach the painters could make to her; a distance they laboured to shorten, and which was gradually shortened with a remarkable steadiness of advance to its consummation in the hands of Michel Angelo and Raphael. It seems to be a great mistake to ascribe so much as is ascribed in the peculiarities of the styles of the Mediæval painters to religious feeling. That they were generally influenced by sincere devotion to the degree attributed to them cannot for a moment be doubted; but the general character of their imitation is the same as that of Chinese art, and is evidently a style, if such it may be called, which must chiefly mark immaturity everywhere and under all circumstances. In the infant art of every country the accidental appearances of nature are omitted, not so much, perhaps, from their being unperceived as from a notion that they would interfere, and when imperfectly given they do interfere, with beauty and expression, both of which have always been the first objects of all serious art. The Chinese, for instance, though much of their ornamental painting belongs to the grotesque, yet in their representations of real life aim to the utmost at beauty, grace and expression. Those enthusiastic admirers of Mediæval art who may think there is something almost sacrilegious in comparing anything by Chinese hands for an instant with it, should know that Flaxman, than whom no man ever more fully appreciated early Italian art, and who, indeed, was the first among the moderns to direct attention to it, saw how much, apart from subject, Chinese painting had in common with it. Chinese pictures could be seen on the walls of his parlour which he admired as well for their grace and simplicity as for the beauty of their colour.

Translucent Enamels on Bas-Relief.

The enamels in *taille d'épargne*, executed for the most part upon a common metal, were rarely the work of great artists; they may be considered, in fact, as trade articles. The Byzantine enamels, on the other hand, belonged to the highest class of goldsmith's work; they were executed upon gold, and were employed for the most sumptuous and costly decorations of churches and palaces. These enamels did not, however, suit the taste of Europe, and especially of Italy, then developing its grand schools of art, and accordingly the style was varied. Instead of forming a number of cells upon the face of a piece of copper, and then filling each of these with a different coloured enamel, the design was chiselled in very feeble relief upon the plate, usually of silver; variously coloured enamel powders were then placed upon it, and the plate heated until they melted and formed a translucent coating of glass over the whole surface, no metallic lines being exposed; the design, being formed by the work beneath, was seen through the transparent enamel. The works of this class are often remarkable for the perfection and variety of colours, the gradations of shades being beautifully produced by different thicknesses of the enamels. Where the relief was highest the enamel of course was thinnest, and consequently the shade of colour lightest; where the metal was chiselled out the enamel was thickest and the colour deepest, the effect being exactly similar to that produced by those pretty coloured porcelain lithophanes which are made in Germany, and of which so many examples were once popular. The scope which this system of enamelling gave to the genius of the artist (for, as Vasari says, "E specie di pittura mescolata con la scultura," a species of painting associated with sculpture) brought it into great favour in Italy from the end of the thirteenth to the beginning of the fifteenth century. From Giovanni Pisani, who executed a high altar for the church of Arezzo, partially decorated in this style in the year 1286, to Benvenuto Cellini, who made some modifications in the processes, it was employed by all the great artists of Italy who occupied themselves with the precious metals, such as Pollajuolo, Francia, &c. A precise description is given of it by Vasari. When the style of enamels in relief was in vogue artists sometimes varied the effect by combining several styles. One of the happiest of these combinations was to produce a silhouette in *taille d'épargne* upon a plate of gold, or more frequently upon silver; the part of the plate tooled out had then some ornaments chiselled upon it in very feeble relief, over which was laid a coating of translucent azure enamel. The folds of the drapery, and the face, hair, &c., were expressed by the graver upon the silhouette in metal, the incised lines being afterwards filled up with a black niello enamel—this was, therefore, a combination of the styles of *taille d'épargne*, niello, and translucent enamel on bas-relief. Another style was practised at an earlier period (thirteenth century) which was a combination of the *taille d'épargne* and of the embedded in filigree style. There was also a peculiar

kind of enamelled work produced in the sixteenth century which belongs to the style in bas-relief, and deserves to be mentioned; it consisted in figures in relief in gold or silver upon an enamelled ground. It is still practised in Russia.

The Pyramids.

What is the meaning of the word pyramid—does it explain the subject? Are the pyramids peculiar to Egypt or do other countries afford analogies? Is there any traditional or recorded event which may be supposed to have led to their erection? With regard to the first, the etymology of the Greeks, whose vanity led them to make every possible adoption to their own language, appears to be the one most commonly received. The pyramids are not peculiar to Egypt, but are to be found in all the earliest postdiluvian researches; and, indeed, have been continued amongst those nations secluded from a general intercourse with other people. The pagoda of China is but a modification of the pyramid, rising storey above storey, and decreasing towards its point; the pyramidal temples of Hindustan present a nearer resemblance, and the pyramids of the Mexican empire, those of Copolula, Papanita and Teotiuachao, present a striking analogy. These last, the pyramids of Teotiuachao, which are placed on due cardinal points, are situated in the valley of Mexico, about eight leagues north-east of the capital; two are of considerable size, that of the Sun being 682 feet at the base, rather less than the second (that of the Moon), and 180 feet in height. They are approached through long avenues of small pyramids placed in exact lines north to south and east to west, and occupy a place called Micoath, *i.e.* road of the dead; they are said to have served as places of sepulture for the chiefs—the like tombs occur round the base of Cheops. Thus have we the Egyptians, Chinese, Hindus and Mexicans, all people of the highest antiquity, all famed for the cultivation of astronomy and the recording of events, each possessing pyramids whose history is enveloped in mystery, but each possessing ends in common—religion, record, sepulture. Touching the third query, is there any circumstance that could have led to this occurrence of idea, their character is too arbitrary and their resemblance too uniform to have been the result of chance. The earliest settlement of the postdiluvian inhabitants was marked by the erection of a high place, which all commentators agree to have been of the pyramidal form. "Go to! let us build us a city, and a tower whose top shall reach to heaven, and let us make for ourselves a name." Engaged on this work they were dispersed over the face of the earth, carrying with them the recollection of their employment, migrating under the sons of the patriarch, and, as their numbers increased, heightening their pride and causing them to forget their Divine protection, the sons of Shem, in their earliest settlements in the east, erected monuments which recorded their arrival or marked their dispersion. The sons of Japhet, prompted by similar feelings, and bearing in recollection the same events, followed the like example in the west; while the sons of Ham, under Mizraim, the founder of the Egyptian empire—famed for the earliest time for their wisdom, profuse of labour and lavish of expense, with conceptions formed in mystery and heightened by their religion, taking magnitude and durability for their models—exceeded their brethren; and while the proud city of the Pharaohs, of which these piles once formed the greatest wonder, has melted away, leaving not a trace behind, the pyramids, renowned for their antiquity and magnitude, became consecrated to the worship of the gods and to the cultivation of their most cherished study—astronomy. Hallowed by these sacred purposes, they were in after times used as the depositories of the illustrious dead.

Equilibrium of Arches.

It is to be observed that in most of, if not in all, their bridges, the ancients did not increase the dimensions of their voussoirs from the crown towards the springing or coussinet, but made them of an equal thickness throughout; in this they were followed by Palladio and all the Italian architects. They sometimes, however, made the alternate voussoirs larger than the others, as Labelye has done in old Westminster Bridge. While the voussoirs are considered as indefinitely short and are held in a state of tottering equilibrium by the vertical pressure of the superincumbent loading alone, as the theory in its simple state requires, the arch would not be calculated to support any extraneous weight. In practice the voussoirs are of considerable length, and their adjacent surfaces are in contact; and when an additional weight is brought to act upon any part, suppose at the crown, it will cause the joints at such part to open on the concave side; the haunches will consequently be forced up and their joints will open on the convex sides; but while the imaginary lines, expressing the directions of pressure passing through the voussoirs, are not so much distorted as to be thrown out of the limits of the surfaces of the blocks, the arch will stand, though loaded at the crown with a certain degree of weight beyond what the strictness of the theory allows; when these imaginary lines are removed out of

the limits of the adjacent blocks or voussoirs, the arch will be completely destroyed. It therefore follows that the voussoirs should be as large as may conveniently be got; the larger they are the more may the distortion be increased without endangering the structure, since the directions of their pressures will be less likely to exceed the limits of their magnitude. In general, while a line can be drawn from the crown to the haunches, passing entirely within the surfaces of the voussoirs, the arch will stand; but when any part of the line falls out of their surfaces the stability of the arch is instantly destroyed. Enough, it is hoped, has been said to convince the artist of the necessity of balancing his arch with caution and as exactly as circumstances will allow; and where an equilibrium according to this theory cannot be obtained, the fertile mind of an ingenious artist will naturally furnish expedients to obviate the inconvenience likely to arise from a want of it.

Æsthetic and Ethic Emotions.

In the palmy days of Rome and Greece, before society became undermined by Persian luxury and effeminacy, the severer virtues held their due place as regulative principles of action in the conduct of mankind. The sensuous and spiritual elements of human nature were combined in their proper hierarchy of rank, and we have the example of this perfect interfusion alike in the sculptures of Phidias and the paintings of Polygnotus. But as luxury crept in this balance of power was destroyed; the sensuous got undue ascendancy over the spiritual element, and left the traces of its victory in the worthless frescoes of Pompeii and the repulsive statues of Commodus. A reaction set in under Christianity, but though in the right direction it was a reaction fatal to art, for it carried the moral element to such an extreme as to extinguish the sensuous, and human nature emerged from the conflict under Constantine maimed and stunted in some of its leading features and stripped of all that refinement which distinguished Rome and Greece during the youth of Pericles and Augustus. We cannot think, even at this time of day, without a shudder of the destruction of the temple of Serapis at Alexandria or the demolition of Jupiter's statue at Rome, by a crowd of fanatics who thought they were advancing the cause of morality by defacing the finest monuments that the genius of man had raised for the worship of the beautiful. The perfection of human nature which grew up in the minds of the early Christian ascetics, as well as in those of our Puritan forefathers, was a lopsided development of the purely moral element alone, with which all feelings of the beautiful and every representation of the sensuous was declared to be at war, and so ruthlessly thrust aside altogether. The moral element gained much strength thereby, but it was a factitious and not a natural strength—a strength waging war against the radical principles of the mental constitution, which it ought to have pressed into its service, and hence totally unfit to spread itself with vigour among the savage hordes whose wild passions steeped Europe in a thousand years of barbarism. As the perfection of the ideal consists in the proper equipoise of all the feelings and emotions acting in their proper rank and sphere, it is quite natural that when the balance is destroyed in favour of asceticism, the interests of art should be no less jeopardised than when the balance is destroyed in the interests of vice.

Literature and Fine Art.

It is commonly supposed that an inseparable connection exists between literature and the fine arts, but upon examination it would seem this is an erroneous opinion. They are both, in their highest efforts, the results of certain occasional states of the public mind affecting the peculiar endowments of individuals. In so far as the productions of literature suggest topics for the chisel or the pencil, it may be said an alliance exists between the sculptor, the painter and the writer, and inasmuch as the creations of sculpture and painting furnish matter for the descriptive pen, the connection and reciprocity are indisputable; but still there is a want of precision in ascribing that connection and reciprocity to any natural or necessary mutual dependence. In their highest as well as in their lowest faculties a distinctive principle peculiar to each is so clear and defined, that it may almost be described as an organic difference. Indeed, this distinction is so prominent that it requires some degree of consideration to discover any mutuality amongst them, the alleged connection being an after-thought, formed subsequent to, and in consequence of, the occasional aids they reciprocally give to each other. A horse as developed from the marble by a sculptor, and the horse of Homer or of Job, have no obvious moral similarity. The sculptor may exhibit both, but the one which is the product of his own conception and those which come from the suggestions of others will be very different. It is a curious fact, long determined by experience, that there is an imitative faculty possessed by many professors of the fine arts, altogether different from the peculiar creative faculty which constitutes the genius of a genuine artist. The fine copies of the great works of the old masters, as they are called,

are the productions of this imitative faculty. It would even seem that there is a third class of artists, consisting of those who have the power of embodying the suggestions of others, but which power deserts them to a great degree when they attempt to give form and pressure to their own conceptions. The noblest progeny of the arts, however, spring not from literature, but are of the artists' own minds. They come perfect from their imaginations, as Minerva from the head of Jupiter. Such are the works of Claude. From what book, or poem, or description, did that elegant and sensitive student of nature derive the subjects of his unrivalled pencil? The Apollo is equally the conception of the artist, and scarcely one of all the great pictures of Raphael can be said to owe their subjects to any literary description. The merest hints are all that literature has supplied to him. No doubt the intelligence diffused by literature assists in exalting and refining the spirit of artists, but it is not essential to them, as the fact of many excellent artists being ignorant even of the commonest generalities of literature sufficiently proves. In the time of Julius II. and Leo X., when the arts had attained a brighter ascendancy than they have since done, literature was not so generally diffused as it is in our time, when art is as much cultivated as it was in those epochs. Claiming, then, an independence for art from literature, acknowledging at the same time the reciprocity which exists between them, we assume that a taste for the one may be cherished without engendering any predilections for the other.

Brasswork in England.

In the reign of Edward III. the exportation of iron, either made at home or brought into England, had been prohibited upon the pain of forfeiting double the value of the quantity exported. And in the reigns of Henry VIII. and Edward VI. several Acts of Parliament had been passed prohibiting the exportation of brass, copper, latten, bell-metal, pan-metal, gun-metal, "shrof-metal," under the same penalty. The forementioned Acts of Parliament were partially repealed by an Act passed in the sixth year of William and Mary, by which it was rendered lawful to export, after March 25, 1694, all manner of iron, copper, or mundic (pyrites); but the prohibition of the other metals was continued. The brassmakers in 1783 applied for the same liberty which had been granted to the iron and copper smelters, a liberty of exporting the crude commodity. This liberty was not granted them by the Legislature, for the Bill, which had passed the House of Commons, was thrown out by the Lords. The Birmingham manufacturers presented a petition to the House of Commons against the Bill which was then pending, in which petition it was represented that frequent attempts had been made to erect manufactures similar to those of Birmingham in different parts of Europe, and that the excellence of some of the Birmingham articles depended upon brass of very different qualities, and that, fortunately for this country, there were several sorts of brass that were peculiarly adapted to the different branches of their manufactures, so that the sort which was suitable for one article was improper for another; and that they had reason to believe that the manner of adapting the various sorts of English brass to different articles in their manufactures was not known to foreigners, but that if free liberty was given to export brass every maker might be induced to discover the peculiar uses of his sort, and that very disagreeable consequences to their manufactures might thereby be produced. The petitioners also represented that brassmakers, in different provinces of this kingdom, had not succeeded in making the sorts of brass made in other provinces; and that one great company of brassmakers had not succeeded in making brass suitable for the Birmingham market, though they had professed an earnest desire to do so. And they humbly apprehended that there never had been such a quantity of brass exported as to render it a national object, and that there was not a probability of any such quantity being exported, though so much might be as to raise a ruinous competition to their manufactures, &c.

The Art of the Illuminator.

The patronage afforded by Charlemagne and his grandson, Charles the Bald, to the art of illuminating MSS. caused a greater number of beautiful volumes to be executed during the eighth and ninth centuries than at any other period, perhaps, that could be named. It is presumed that Italian or German artists (who worked after the models of the Greek school) were chiefly employed, and as a splendid instance of the mechanical skill thus exercised, the Bible of Charlemagne, preserved in the church of St. Paul at Rome, is probably not to be equalled, even at the present day. It affords also a decisive proof that the taste and execution displayed in ornamental accessories of MSS. did not decline in the same manner as the higher branches of composition and colouring, nor are to be judged by the same rules, but gradually advanced in perfection from the eighth to the sixteenth centuries. Manuscripts of the eleventh century exhibit very beautiful instances of borders,

particularly Greek MSS. executed for persons of rank, such as the copy of St. Chrysostom's writings, illuminated for the Emperor Nicephorus Botoniata, between the years 1078-81. The twelfth century is remarkable for a profusion of ornament and a graceful but intricate mode of illuminating capital letters, which renders it more easy to recognise manuscripts of this period than any other. In the thirteenth century the art of illuminating, in some respects, deteriorated, and endeavoured to supply in splendour what it lost in correctness of taste. The backgrounds of miniatures and initial letters seem like plates of solid gold, and the colours (chiefly red and blue, heightened with white) are worked up so as frequently to have the effect of oil-painting. This style prevailed most from about the year 1190 to 1230, and among the numerous splendid examples of it in existence may be instanced the Bestiary in the Ashmolean Library, the Weingarten Breviaries, preserved at Holkham, and the Psalter in the royal library, l. D. x. In general, MSS. of this class are of German or French execution. To the early part of the fourteenth century are to be ascribed the numerous MSS. executed in England and France, in which appear large initial letters of purple, red and gold, containing figures of men and animals, and terminating in spiral scrolls, which extend along the upper and lower margins of the volume, often supporting small groups or single figures of dogs, hares, apes, &c. During the fifteenth century the art of painting made rapid strides towards the perfection it attained in the subsequent age, and numberless examples remain in public and private libraries, exhibiting an endless variety of design and colouring. To particularise is scarcely necessary, where so ample a field is presented; but in beauty and richness of execution perhaps there are but few volumes which surpass the collection of the Poems of Christina de Pise in the Harleian Library, No. 4,431; the celebrated Bedford Missal, once in the possession of Sir John Tobin; or the collection of romances presented by the Earl of Shrewsbury to Margaret of Anjou, preserved among the royal MSS. All these were executed by French artists, whose skill was at this period generally patronised; and it is from the reign of Henry V. may be dated the decline of the art in England, since the close connection with France, and the Low Countries caused foreigners to be employed to the prejudice of native talent. The sixteenth century witnessed the final triumph of art produced by the successive pencils of Da Vinci, Raphael, Giulio Romano and Julio Clovio, and the numerous libraries formed during the latter half of the preceding century gave a stimulus to the success of these distinguished men. Miniature painting received a new degree of lustre and dignity from its being practised by artists who were also renowned for works executed on a grander scale. Of these artists, the one who rose to the highest degree of eminence as an illuminator of missals, and who seems never to have been surpassed, was Julio Clovio. His paintings are inimitable, and must be seen to be justly appreciated. They were chiefly executed for the libraries of Cosmo de Medici and the Cardinals Grimani and Farnese, and but few specimens of celebrity have reached this country.

Proportion in Architecture.

Proportion, in its simplest mode, is to form what time is to music, or measure to poetry; but in its more complex mode, it is to form what grammar is to language, or harmony to music. Proportion may be in the relative sizes of two or more objects—the relative dimensions that the length bears to the breadth of an object—the relative obtuseness or acuteness of various angles—the relative classes of curvature in various objects or in the parts of one object; or, it may be, in the general relation that various forms bear to one another in rendering their combinations harmonious. Proportion is, in short, that geometrical quality in forms and figures by which they are rendered pleasing to the sense of sight, independently of their use or any other consideration.

The Sphinx.

The commonplace book of Mr. Baldwin, once British consul in Egypt, contains the following solution of the figure of the sphinx:—"I have heard strange fables and strange conjectures concerning the Egyptian deity, but I have never met with its solution in the simple manner in which it has occurred to me. The sphinx is represented by a figure having the body of a lion and the bust and head of a virgin, forming together a figure composed of the two signs of the zodiac, Leo and Virgo, through which signs the sun is coursing at the time of the inundations of the Nile, from which Egypt derives its fertility and the people their subsistence. It was very natural, therefore, for an enlightened people, leading the opinions of their credulous and superstitious brethren, wishing to dedicate their gratitude to a Supreme Being, to attribute the felicity they derived from this immediate cause to the apparent one in the heavens; and, consequently, to compose a deity of those signs in which the sun prevailed during the inundations of the Nile, from which all their abundance necessarily depended."

NOTES AND COMMENTS.

IN England the actions and the defence to actions by municipal bodies are often evidence of a desire to be as free from responsibility for neglect as any despotic authority abroad. The Municipal Council of Sydney, New South Wales, appear to have imitated the English practice to that extent. Owing to the negligence of the Council in allowing one of the streets to fall into an unsafe state, a man who was driving a cart was thrown on the roadway and killed. The widow brought an action, and judgment was given in her favour. The Town Council, however, appealed to the Judicial Committee of the Privy Council, and the case was heard on Saturday. Judgment was given in favour of the Council. The reason given was that there was no obligation on the Council to keep streets in repair. In the Act 43 Vict. No. 3, there was the following clause:—"All public ways in the city of Sydney now or hereafter formed shall be vested in the Council, who shall have full power to alter, widen, level, divert, extend, construct, improve, maintain, repair and order such public ways and the footpaths thereof, and to carry off any water, mud or filth therefrom by means of sewers, channels or drains, or otherwise." In the clause there is an abundance of verbs of an active sort. But according to the Lord Chancellor they only empower the Council to repair, and do not prescribe that operation. There was no duty or liability in respect of the repairs of streets resting with the Corporation. Whether that was a satisfactory state of the law it was not for the Judicial Committee to declare. The verdict was accordingly entered for the Sydney Town Council. At a time when many colonial towns are suffering from financial embarrassments it may be prudent to avoid paying compensation for negligence, even when the amount is not excessive. But it is not advantageous for a city to shirk its responsibilities. It is quite plain that when the Acts were passed the repair of the streets was imposed on the Council, and any body of private citizens who attempted to discharge that duty would be liable to a penalty. The case is, however, remarkable as showing the infectious power of some of the English precedents.

THE city familiarly known as "dear, dirty Dublin" has an ill reputation for its neglect of sanitary arrangements. The superintendent medical officer of health has to admit that, with the exception of St. Helens and Belfast, Dublin has the highest typhoid fever death-rate in the United Kingdom. That is mainly caused by the condition of the soil, owing to the gross neglect of drainage during centuries. But there are also preventible defects in abundance. From the last report of the Dublin Sanitary Association, it is manifest that the domestic drainage system is in a deplorable condition. It was found that among the drains from the houses examined last year 50 per cent. were defective. The useless traps were in a corresponding proportion. The casings of closets which were defective were 55 per cent. There was a leakage from drains in about a fourth of the houses examined, but the leaking outside rose to 58 per cent. The income of the Dublin Sanitary Association in 1894 was 3867, and for so moderate a sum much has been done. The great obstacle to progress is the ignorance of the people and the want of self-reliance. When we find the President of the Association, who is a physician, saying, "The experience of the present winter is firmly to establish a growing conviction on my mind that neither the municipal authorities, nor the metropolitan police, nor the householders in our city and suburbs, have the remotest conception how the streets and footways should be cleansed and rendered safe in cold spells, when ice exists or snow has fallen," we may assume that in most other matters belonging to sanitation there is no less helplessness.

THE most important consideration in all Government departments in this country is to preserve the officials from trouble. What has to be sacrificed to attain that end is of minor importance. As a consequence, when work of any kind has to be executed by people who are not brought up in circumlocutory ways, it is truly right and just according

to the official mind that responsibility for the outsiders should be minimised. A typical illustration has been afforded by the Office of Works. In Dundee it is proposed to erect a post office. There, as in most parts of Scotland, separate contracts for the most important trades are adopted. Architects undoubtedly find the arrangement increases their labours, but it is established and it is found to be economical, as well as conducive to excellence in workmanship. Architects may, if they like, in their client's interest, undergo more toil without seeking a higher percentage. But it is not to be supposed that the fine gentlemen who condescend to spend a very few hours daily in a Government office could accept ordinary architects as models of conduct. Accordingly it was decided to introduce an innovation in Scottish practice and hand over the erection of the post office to a single contractor. Confidence in building as in political procedure is of slow growth, and it is not to be expected that northern contractors will engage in a novel experiment without allowing themselves a very liberal sum for contingencies. But what is a sum of that kind to an official who represents a Government that can readily raise millions? The saving in foolscap can be pointed out as an equivalent. Sir JOHN LENG, who has the interests of Dundee as well as of the country at heart, advised the First Commissioner of Works that the invariable practice in the district was to have contracts for masonry, woodwork, plumbing, &c., and that the builders as well as architects preferred it to any other. It has been adopted in costlier buildings than the post office. But Sir JOHN LENG could only regard the subject from the point of view of a man of business who recommended a course he had adopted in his own building operations, which were on the largest scale. He has yet to learn how insignificant economy appears under an official aspect. Mr. HERBERT GLADSTONE has enlightened him. Sir JOHN LENG is informed there is no precedent for his recommendation, or, as it is expressed in the grandiose style of Whitehall Place, "There is no record in the Department of objection raised to this system in theory, or of difficulty or inconvenience arising in practice." It is not stated, however, what price was paid by the Department whenever a system of contracting was revolutionised. Contractors, like other people, can submit to inconvenience when it brings them profit. The advantage of the innovation in Mr. H. GLADSTONE'S eyes is that his department will have only to endure one man or one firm. He knows that the work will be sublet to men without his approval, but it appears "the Board have always held that subletting is not necessarily an evil." No official cognisance, however, is taken of the inferior beings who undertake it; they give no trouble to the pontifical superiorities who preside over contracts, and as it is apprehended that master masons and master wrights and master plasterers of Scottish types might look on those who constitute departments, boards and offices as mortals, it is concluded that "no sufficient reason has been shown for altering a practice which is certainly convenient to the Department." To that convenience economy must be sacrificed. Such is government in 1895.

THE fascination that, happily for France, is exercised upon the thinkers of that country by English manners ancient and modern is suggested by the works to which prizes have just been awarded by the Académie Française. The Vicomte DE LA FERRIÈRE has gained the second prix Gobert by his "Courts of England and France in the Sixteenth Century" and "Love Dramas," which relate to ANNE BOLEYN and Queen ELIZABETH. M. LAFLEUR DE KERMAINGANT obtained another prize for his "A French Embassy to England in the Time of Henry IV.," and also M. GAVARD for his "Diplomatist from London." Among the works which have shared in the Prix Guérin are M. CHEVILLON'S "Sydney Smith and the Renaissance of Liberal Ideas in England in the Nineteenth Century," and M. MAX LECLERC'S "Education and Society in England." The principal moiety of the Prix Bordin has been awarded to M. J. J. JUSSERAND for his "Literary History of the English People to the Time of the Renaissance." When the Académie is found to be so partial to English themes it is no wonder French writers and artists are seeking models for imitation among us.

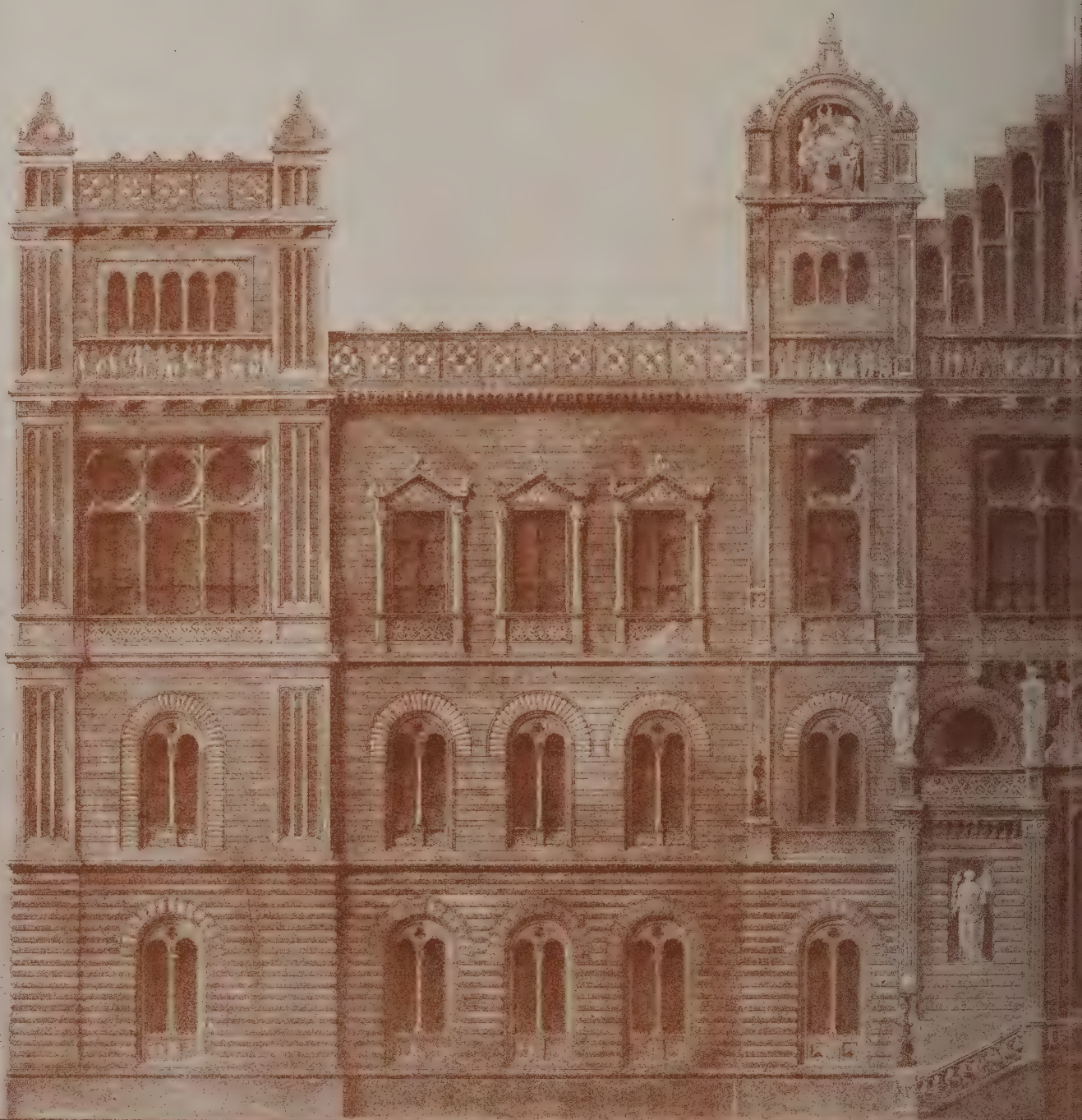


WEST FRONT: ELEVATION OF A D310
FREDERICK



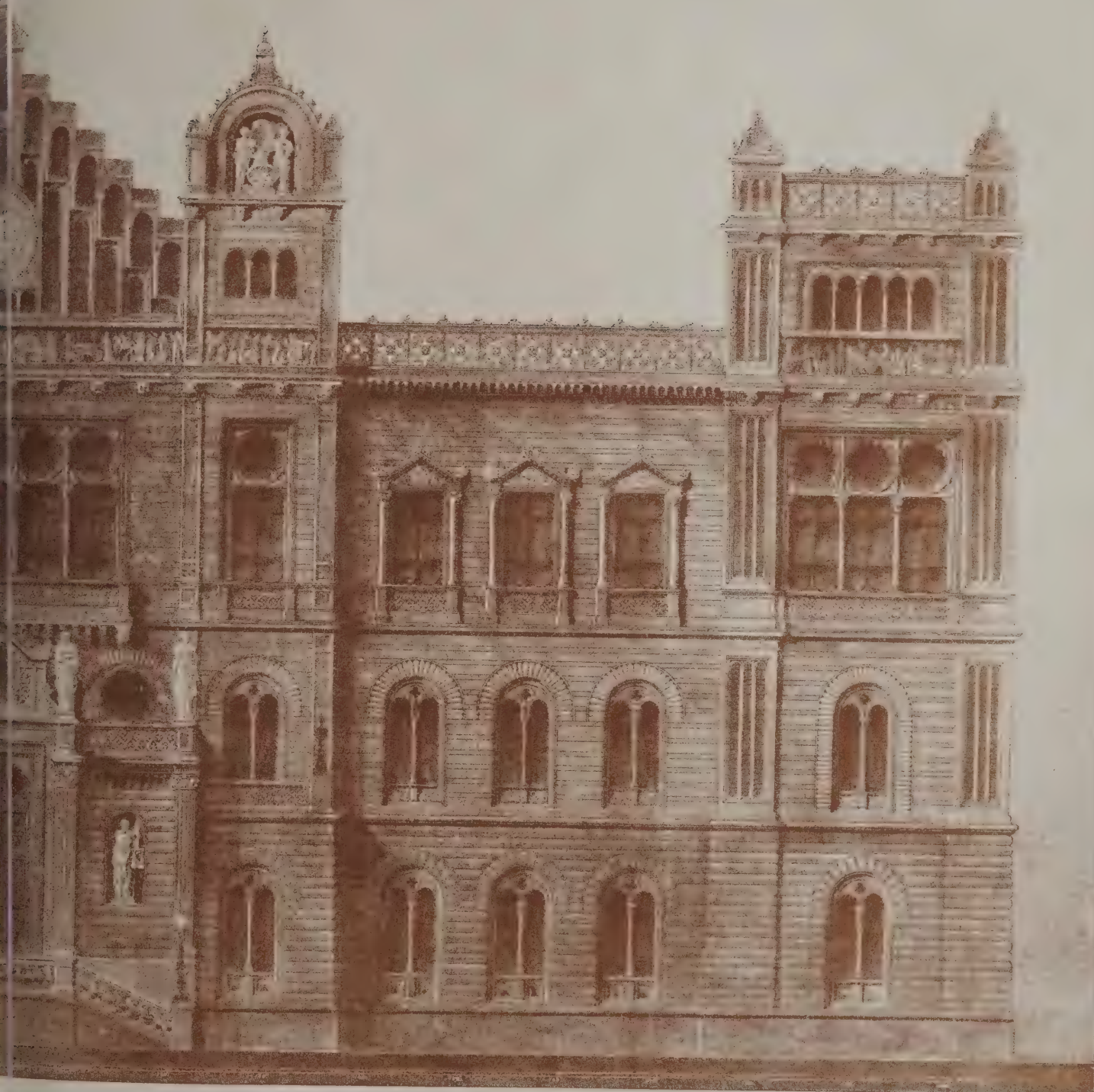
1111-1112 PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C. 4.

FOR A ROMAN CATHOLIC CATHEDRAL.
Architect.



ELEVATION OF PROPOSED D
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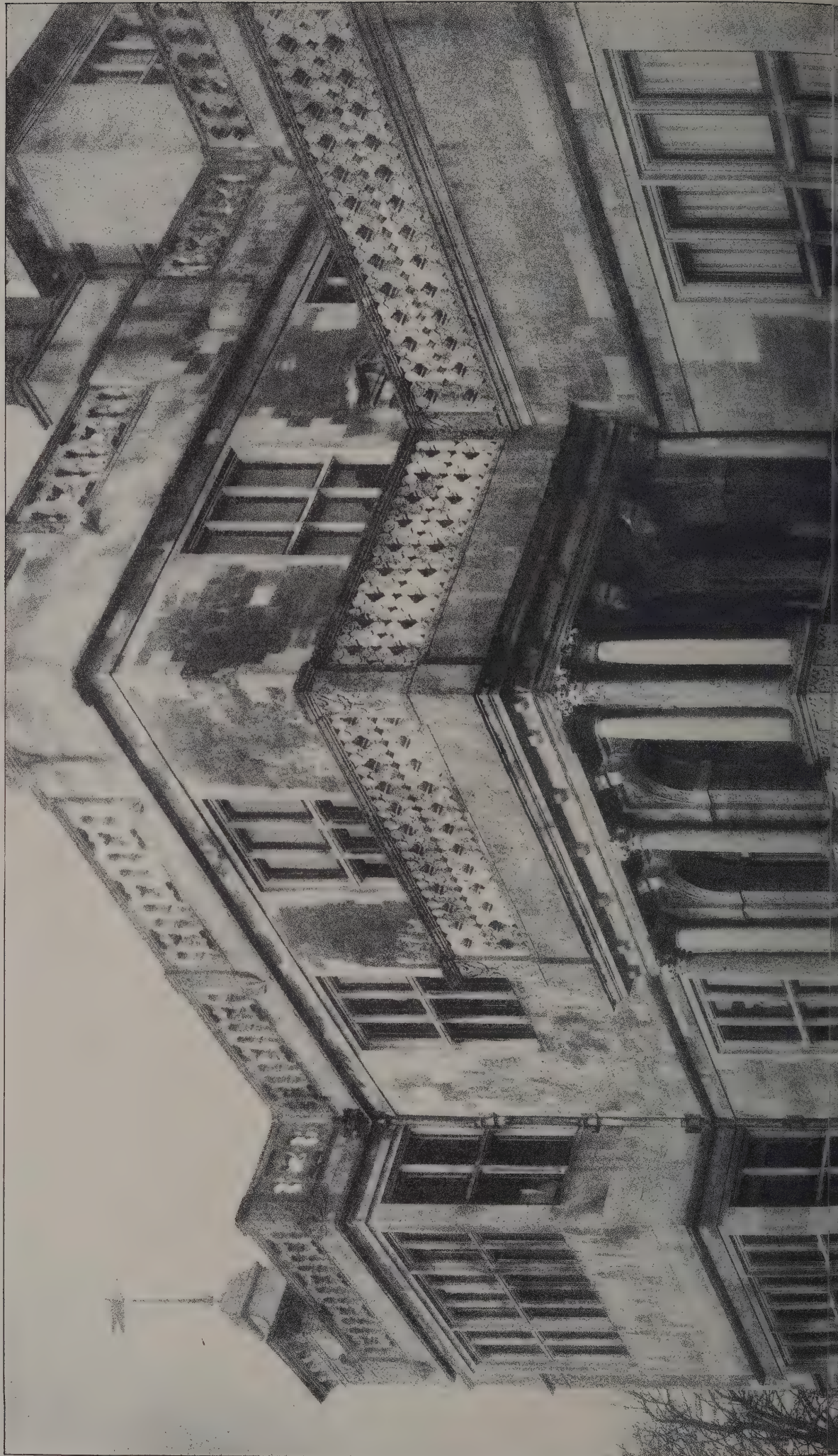
May 17th 1895.



INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

ER OF COMMERCE, LONDON.
G Architect.

The Architect, May 17th 1895.





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THE NORTH PORCH : AUDLEY END, ESSEX.

ILLUSTRATIONS.

DESIGN FOR A ROMAN CATHOLIC CATHEDRAL.

THE ground plan of this church is based on the form of a Latin cross, like most of the cathedrals and many abbeys and other churches of the West. In the East the Greek cross, more approaching a square, is adopted, such as we see in Santa Sophia at Constantinople, St. Mark's at Venice, and many others. In the present plan the oblong, with its cross branches, forming the transepts in the shape of the Latin cross, has been adopted. The arrangement of piers, carrying the vaulted roof of the nave and its surrounding ambulatory, remind us in their solid treatment of the best specimens of Roman and Romanesque ecclesiastical buildings up to the twelfth century in Europe, and give the beholder a sense of strength combined with beauty, which some may prefer to the clustered pillars of the later Gothic period. The guiding principle of the earlier masters was simplicity and dignity. Their golden age began in Europe in the time of CHARLES THE GREAT and succeeding emperors and kings of the Holy Roman Empire. Some of the works they ordered are lasting monuments of beauty and strength, and combine Christian cheerfulness and deeply devotional feelings. Some of the Italian masters, though influenced by Northern Gothic, did not entirely abandon the hints given to them by the old masters of Romanesque architecture, and, though slightly adopting in their works some Gothic features, successfully united the gracefulness of the south, such as can be seen now in Italy.

The dimensions of the interior of the building, shown on the plate, are:—Length of the interior of the cathedral, 465 feet from inside of main entrance to back of apse; the breadth through transepts from inside of south side to north side entrances is 320 feet; the span of the dome is 116 feet; the height of dome is 168 feet; the nave is 50 feet wide and 112 feet high to crown of arch. The ambulatory on the ground floor (for processional purposes) is 10 feet wide. A similar ambulatory or gallery surrounds the cathedral on the first floor, and also arranged around the edifice. The design is by Mr. F. SANG.

ELEVATION OF PROPOSED CHAMBER OF COMMERCE, LONDON.

THE NORTH PORCH, AUDLEY END ESSEX.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening, Mr. F. G. Hooper, vice-president, in the chair. Mr. W. B. Dukes was elected a member.

Nominations.

The house list for the next session, as prepared by the committee, was read over. The name of Mr. W. A. Webb was added to the list as member of committee, on the proposal of one of the members. Messrs. Arnold S. Tayler, J. H. Tyars, E. Greenop and T. C. Agutter were appointed scrutineers for the election.

Mr. JOHN BELCHER then read the following paper, entitled

Treillage.

Mr. Belcher said:—In addressing you this evening on "Treillage," it may be objected that I have selected a somewhat trivial subject, and one unworthy of the serious attention of an architect. But I venture to do so because I am convinced that (in the architect's hands) it is a simple and suggestive medium, by which he can obtain important and good effects in connection with gardens and domestic buildings.

Wherever wood construction has been in vogue varied treatment of "post-and-rail" and "lattice-work" has been in use all the world over.

India and Burmah, China and Japan, each has its characteristic treatment worked out with wonderful elaboration and finish. The familiar Cairo lattice-work is another variety of the same thing in the East, while every European country upon which the sun shines has its own method of affording shade and shelter by trellis-work.

The words "treillage" and "trellis" are sometimes used interchangeably, but the distinction between them would seem to be that treillage, originally at any rate, meant a series of posts and rails to support espaliers and fruit trees, while trellis was appropriated to mere lattice-work.

The comprehensive title of "trellis"-work is now, however, in general use for all varieties; while treillage is a technical term (obviously from the French). "not generally understood of the people"

Treillage probably originated in Italy, in vine-training, and its use extended for trailing plants and creepers. It thus came to be used in pleasure gardens in connection with trellis proper, and a recognition of its use and beauty so combined led to its adaptation to architectural treatment. In old tapestries as well as in illuminated MSS. you will find trellis-work and palisades represented in many garden scenes. There is a beautiful picture by Luini (date about 1495) entitled *Our Lady of the Lattice*, which shows that treillage was appreciated by the painter.

Mr. Reginald Blomfield, in his book on "The Formal Garden in England," gives an illustration of a garden dating from the latter part of the fifteenth century. It is taken from "The Romance of the Rose," in the British Museum. It is a walled-in garden subdivided by a trellis fence in which is an arched gateway with trellis gates.

Again, there is a very suggestive example in "The Gardener's Labyrinth," published in 1577. The gate at the top is the exit into the open country beyond, and the archway on the right is the entrance which communicates with the cultivated grounds. The central enclosure is formed of ornamental pilasters and trellis-work.

I do not propose to attempt, even if I were able to do so, any historical description of the gradual development of trellis-work. My object is to suggest its more extended use and recognition. I would point out that it has a poetical and romantic side as well as a useful one. Such a medium may be to the architect what clay is to the sculptor; in it he may venture to give shape to some poetic dream of ethereal architecture which has visited his brain, or at any rate (if this seem too large a flight of fancy) he may realise, if only temporarily, some playful fancy for his own satisfaction in work which, from the very nature of its material, cannot be taken seriously, or raise great expectations. It is the ease and facility with which daring experiments can be made which render it valuable. It can be altered and shifted at pleasure until the desired effect is obtained in a way which more solid and valuable materials prohibit.

And it thus affords opportunities for judging effects which may subsequently be translated into stone or brick. So that those workers who are yet in the flush of youth, and who possess that enthusiasm which in youth is the natural prescriptive right of all, while its retention in advanced age is a special grace given but to the few, may yet find in trellis-work a means of expression of their "soarings after the infinite." To the student it presents the advantage of a material in which he can try experiments. He can buy a bundle or two of plasterer's laths and interlace them, and form panels and arches and many devices within a few feet of the back wall of his garden, which will increase its interest. And beyond all this I think trellis-work itself is capable of a further development, of being adapted to other uses than those to which it has hitherto been applied, uses for which its nature and lightness render it suitable, while its decorative character must be recognised by every artist.

As its form and use grew out of the necessities of the garden I will give priority to the consideration of its use and value in laying out a garden. I suppose I may take it for granted that an architect admits the importance and recognises the advantage of the "formal" garden in the immediate proximity of his building.

The T-square and set-square should be used in planning the courts and spaces outside the four walls of the house. Its straight lines should be extended and linked with nature, stretching out on every side like tendrils to attach it to the soil. This is effected by enclosing garden walls and entrance and kitchen courts by terraces and tennis-grounds.

My partiality for the formal old English garden tempts me to a dissertation on its advantages, but I must confine my remarks to the employment of trellis-work to obtain certain effects.

In the art of laying-out a garden, as in architectural design, there is a certain seductive mystery gained by partially concealing and judiciously screening some parts from immediate view. By this means the imagination is tempted to conjecture the presence of hidden delights beyond, and interest is quickened in expectation of some further enchantment.

Besides the fact that divisions of some kind are necessary for such surprises to the casual visitor, they have always the additional and permanent advantage of affording seclusion, quiet and comfort. The very flowers and shrubs enjoy the retreat, for in the shelter they luxuriate, and their sweet fragrance is not dispersed by rude winds. Tall hedges of yew, laurel or holly form substantial divisions, but years must elapse before such hedges can be effective. And here the common or garden trellis will prove the temporary substitute. Against

it the hedge can be planted and protected and trained. On the wood-trellis roses, clematis, jessamine and honeysuckle will climb readily, and show their preference for it over cold and un congenial iron rods and chains or wire.

With the flexible laths, deep archways can be formed in the trellis division just long enough to form a dark frame to the picture beyond. Or if a peep is required here or there, a few laths can be cut and a bent piece or hoop of wood, circular or oval, inserted, forming an unglazed window in the trellis or hedge. There is an example in the Penshurst garden.

Again, should it be desirable that the upper part of a high screen, or parts of it, be more open or only partially hide what is behind it, then the trellis can be cut into patterns more or less open as desired—sometimes in panels, sometimes in a running pattern.

It is to the credit of lawn-tennis, from the point of view of the architect, that it has given him an opportunity to make some formal division of the grounds; and in this case the trellis screen is of such obvious utility in protecting the flower-garden that it will appeal to most clients. If the ground for the tennis-courts is sunk, as it should be, the height of the slope and fence combined will suffice to stop the balls passing beyond.

How difficult it is to persuade a client to screen off any part of his ground. He has an idea that he will lose something unless he can see it all at once—that the extent of his possession will not be appreciated by others.

An Englishman will go any length to obtain a separate compartment to himself in a railway train, yet has not the same desire for seclusion on his own land. His active temperament and love of exercise draws him to the open country; whereas the Dutch, on the other hand, whose grounds are restricted, like repose and seclusion, and the Chinese, who are not walkers by choice, prefer to cram into the smallest area diminutive imitations of nature in every mood, with mountains, rocks, water, rivers, bridges, all in strange profusion and exaggerated quaintness.

Examine an old willow-pattern plate and see the trellis-work in use, the palisading, the bridge, and the varied trellis patterns suggested in the margin. I can only allude to foreign work now, and must confine my attention to our own traditional methods, which have been largely formed on the Chinese.

Judging from the accounts preserved of work done by Henry VIII. at Hampton Court after Wolsey's death in 1530, he must have made use of treillage and trellis very largely. We find described 180 posts and "960 yds. of rayle," painted white and green.

In the design of the garden in "The Gardener's Labyrinth" we have evidently an early architectural treatment, showing pilasters or terminals with panels of trellis-work. In some old gardens the enclosures are shaped and laid out in geometrical forms, niches for statuary or vases, circular apses for family or social gatherings, and sheltered places for one or more. I have just completed in this manner a rose garden with a rose temple, of which I have brought you the plan and details. Open seats in the shade are preferable to the highly-varnished "rustic summer-house" atrocity, which is the cockney's delight.

Treillage suggests the shady walk or covered alley. The posts with top rail and cross rails on which may be grown roses, honeysuckle and such like. The Italian treatment of the horizontal tie is excellent, the shaped ends projecting beyond the post; in profile they group well and look picturesque. The Chinese and Japanese have a similar treatment of the horizontal bar over entrances, but the ends are turned up.

Bacon in his essay on an ideal garden says:—"For the ordering of the ground . . . I leave it to a variety of device . . . Little low hedges, round like welts, with some pretty pyramids I like well, and in some places fair columns upon frames of carpenters' work." These trellis columns are very effective and can be used for garden retreats and in conservatories, for round them many flowering creepers can be entwined.

One of the most successful examples I know of open trellis columns and entablature and cornice is in the garden of Mr. Alma-Tadema. It was carried out some years ago by Mr. Brydon, who has most kindly lent us his drawings. You will appreciate, I know, these working drawings and studies. Nothing could be better than this bit of trellis architecture, which is beautiful in summer and winter alike.

I will ask you to note the plan. Its arrangement gives length to the lawn while the open appearance is still preserved; but in walking along the pathway the spectator is partially screened, and enjoys a succession of framed pictures between the columns. At the circular apse round the edge of the semi-pond the columns are placed closer together and form a protective fence. They are reflected with their rose attire in the water beneath them, a happy mixture of nature and art. It is not architecture in the severe and solemn stateliness of public life, but, as it were, relaxing in private, and with light and playful fancy mixing with the flowers in their own domain; disporting with freedom in the sweet seclusion of the garden enclosed.

It may be well, while we have so good an example before

us, to examine the detail and construction, and learn how this fairy-like effect is obtained. There is first of all a certain commendable and quiet humour evinced and maintained throughout.

The interpretation of columns and entablature into trellis-work is worthy of your attention. The "flutings" of the column are represented by the voids and the "fillets" by the laths. In the lower part of the columns, to one-third of their height, there are "reeds" represented by circular rods. The laths and reeds are fastened to rings at intervals. The "Ionic caps," with their "volutes," are ingeniously managed. The introduction of the "triglyph" in this "order" is also amusing. Then a fretwork pattern is happily introduced in the fascia, and round balls at regular intervals in the bottom member. These devices I shall have occasion to notice in pointing out developments in some seventeenth-century examples. There are other architectural garden "properties" shown on the drawings which go to prove how adaptable trellis laths are to curved and other work.

In 1773 Sir William Chambers published a "Dissertation on Oriental Gardens," and illustrated his designs for the Pagoda and Chinese temples at Kew. I have reproduced one example. His work probably encouraged and extended the use of trellis-work in England, so that trellis verandahs and porches became exceedingly popular. They were used not only in favourite seaside resorts and suburban residences, but examples are also to be found in fashionable neighbourhoods and round the parks. And I now propose to draw your attention to some examples of these which I have collected, and which are either good or instructive.

In Piccadilly, for instance, there is a good and refined example at the residence of the Duke of Cambridge. It is of the "Adams period." The division of this long verandah is effective. The larger openings are in front of the windows, and the intermediate arches, with their double circle ornament above, make a pleasing diversity. The construction is very light and suitable to a balcony carried on consoles.

Example No. 2, at the Marble Arch, is inferior though good in its way. The projecting porch no doubt determined the width of the arches, and the divisions are filled in with lattice-work. Here the fascia is open and the pattern varied. You will see the same fascia pattern in Example No. 3, at the corner of George Street, Hanover Square. This is a most fascinating one of excellent proportion. Here we see a valance introduced under the gutter (a feature which found great favour with engineers in finishing the platform covering to railway-stations).

In Example No. 4 there is a similar valance both to the verandah in the right-hand corner of the view and that to the bow window. The latter is carried by slight reeded columns and caps; between these is a kind of trellis curtain and fringe of bells which gives it a Chinese flavour.

There is another form of valance and post to the upper balcony in Example No. 5. The lower balcony, which has evidently been designed from trellis examples, cannot, however, be claimed as such.

Still another variety of "valance," and probably an earlier one, is seen in the interesting Example No. 6. And I have seen others showing a still more realistic curtain treatment, which I fancy must have been designed by the same hand, for the intersecting circles in the pilaster and filling in of the spandrels of the Tudor arch are the same.

In Example No. 7 we have a departure from the lattice-work and a more open treatment of the divisions suggested by Chinese examples.

A most striking and clever adaptation of Chinese forms is seen in Example No. 8, and the panel over the arch shows how openings can be ornamentally formed in the trellis-work.

Example No. 17 is a good and simple bay-shaped verandah. The treatment is excellent. I commend it to your attention when you are passing Grosvenor Gate. It is at the corner of Upper Grosvenor Street.

The other examples are but variations on those I have already described. Nos. 13, 14, and 15 are taken from designs by C. Middleton, published in the last century by J. Taylor.

In passing, I should like to draw your attention to the wrought and cast-iron railing enclosures to the balconies; they partake of much of the refinement of the period of the trellis verandahs.

I have refrained from describing examples of iron trellis-work, as I consider they form a separate subject. I have, however, brought one or two examples. The one from a house opposite the Marble Arch is good, and the treatment of the balcony railing interesting.

The stone or marble trellis of the East, and the marble trellis of Italy, contain many forms which can be translated into wood treatment, but it cannot be too strongly insisted upon that the forms suitable to one material are unfit for, and should not be imitated in, another.

The construction of fences, arches, verandahs and porches in trellis-work is exceedingly simple. In division fences the posts vary in thickness, according to their height and distance

apart, and are frequently finished with some sort of terminal; a small fillet is all that is used to keep the ends of the laths in position against the posts. The top and bottom rails are often plain, the top having a projecting cover piece, or are sometimes moulded, and the bottom rail is kept well off the ground. The laths are arranged in several ways and in larger or smaller meshes, as lightness or increased density is required.

In garden fences the laths are sometimes interlaced, but more usually they are laid across each other, and pinned together in squares or diamonds. Other variations are obtained by doubling the lines of the pattern, as shown on some of the examples before you.

When, however, in verandahs and porches, for instance, other geometrical forms are needed, they are made up of circles, curves and radiating bars, mostly put together in sections, though some of them are cut out, and form a species of fretwork.

Instead of the ordinary thin lath, strips or fillets of greater thickness, ranging from $\frac{3}{8}$ in. by $\frac{1}{2}$ in. and upwards, are used when the pattern is very open. The columns at 17 Grove End Road, N.W., are constructed in this manner, as are those in Example No. 20, but in other examples the columns are formed of laths on rings, in which case a centre post is necessary. No. 20 is an example in which a thin lath is twisted round the column. It is not only graceful, but serves to bind together the sheaf of laths.

The porch in Example No. 19 is a typical one, showing the curved and interlacing circles. It is put together in pieces with brads. I have figured the sizes of the several parts. Other devices I have mentioned, such as the use of turned wooden balls or reels, used to separate the constructional posts from the smaller pieces between them. They are well shown in No. 9 and also in Nos. 1, 6, 8. In Example No. 2, instead of the ball, the division is made with square fillets.

The "ball" is also used as a fringe ornament as in Example No. 10, and is easily nailed to the soffit.

In Example No. 6 a three-quarter circular rod has been cut up into inch lengths, which have been fixed under the fascia as a kind of dentil course. Square dentils are also frequently used, as they are easily bradded on the cornice.

In many of the best examples of verandahs we may note that the constructional timbers are reeded, or treated with a hollow moulding to secure a light appearance. Small reeded columns are not unusual, as in Examples No. 4 and No. 10, and indeed form a very characteristic wood treatment of the period. The caps to such columns also are interesting, and some in form resemble a mushroom button, as in Example No. 18.

In Example No. 16, which is taken from Weale's "Carpentry," published in 1852 (a book which contains examples from Brighton), the details of the construction are given.

In trellis designs it is the solids and voids which must be taken into consideration. How admirably this has been calculated in No. 6. The dentils and the valance, &c., stand out against the black void.

Garden seats with trellis-work backs were very general in the last century. The backs, and sometimes other parts, were arranged in panels very similar to those on balconies. Such seats have been reproduced in many forms by Mr. Marcus Stone in his pictures. They are so excellent in design and so ornamental to the garden that a revival of the treatment may well be advocated.

It would no doubt be generally difficult to supersede the imitation rustic seats in cast-iron and other cheap forms of garden-seats; but for special positions, and particularly where a circular seat is required, place should be found for the work in wood. There is a good seat designed by Mr. Blomfield, which he has kindly lent me with other drawings.

In connection with treillage I must not omit to mention the several forms of palisade already hinted at. The earliest decorative one is the example I have taken from Mr. Blomfield's book. Later ones consist of variations of the post and rail, with plain or shaped laths of more or less elaborate design.

Colour was largely employed in emphasising the forms of trellis-work. Green and white, and red and white were the colours in vogue in old work, if we may rely on tapestries and the painters' accounts preserved.

When, however, oak is used in garden work, the delightful silvery tint it gains with age is valuable. If the work is in deal then the dark green is most effective. For verandahs, &c., the dark green also tells well against a plaster or cement background, but when the brick wall is dark in tone, then white or stone colour looks well.

With regard to the further use of trellis-work, I have hinted at, I might say that one amongst other ways in which its use might be developed is in internal domestic work. The staircase affords an opportunity, as, instead of the ordinary baluster, some trellis pattern can be effectively adapted.

There is one on the screen which has been designed from an old example I found in a house in Gloucestershire. And I have also seen beautiful trellis enclosures to the landings on an old staircase, carried up to the ceiling, with arches, pilasters and window openings of quaint design and detail.

Opportunity is also afforded to the County Council for the use of trellis-work in the erection of "band-stands" in the people's recreation grounds. The pavilion designed by Sir W. Chambers is very suggestive and quite adapted to such a purpose. Light ironwork is too brittle, and is easily broken, whereas the wood gives, and even if a lath is snapped it is more easily repaired than ironwork. Their garden seats and shelters also afford excellent opportunities for its use.

Doubtless you can call to memory many a quaint and beautiful example of trellis-work in screens, colonnades, verandahs and porches. Indeed, there are so many still existing in localities now remote and retired, but which were fashionable last century, that it is not possible to produce here more than a few typical examples.

It is sad to think that when these interesting neighbourhoods come to be opened up for so-called improvements, red brick with terra-cotta trimmings will be substituted for the houses and their contemporary trellis-work.

If only we might return again to the simple brick or plaster front without an ounce of unnecessary detail, but decorated with some festive little trellis balcony or porch, how refreshing it would prove, and would be less costly and quite as lasting.

A well-designed piece of trellis-work gives to the substantial building to which it is attached something of that grace which is lent to garden architecture by the natural growth of creepers.

I know that much more might be said, and better said, in favour of trellis-work and its more extended use; but I hope I have said enough to rouse your interest in it, and that the examples I have brought to your notice at least warrant my drawing attention to the subject of treillage.

Mr. J. M. Brydon proposed a vote of thanks to Mr. Belcher for his paper, which was seconded by Mr. A. S. Tayler, and passed by acclamation.

As proposed by Mr. Goldsmith, hon. secretary, the formal proceedings were terminated, and, under the guidance of Mr. Belcher, the members examined the illustrations shown on the walls.

GEORGE MEIKLE KEMP.

THE separation by oceans does not make Scotsmen forget their countrymen. It is remarkable that attention should first be called to the duty of commemorating the existence of the self-taught architect, G. M. Kemp, in the columns of the *Scottish American*. In that journal is the following article:—

There is one centenary which will occur soon that should not be overlooked, especially by Scottish architects and mechanics. Its celebration would honour the memory of a man who made Scottish architecture famous, and who rose from the carpenter's bench and graduated from a country workshop to build a monument which is yet the most stately and beautiful in the three kingdoms. This was George Meikle Kemp, the designer of the magnificent pile which not only commemorates Sir Walter Scott, but is one of the landmarks of Edinburgh. He was born in the clachan of Moorfoot, near the Gledhouse stream, on the southern border of Midlothian, on May 25, 1795. His father was a shepherd. Nothing of the clachan now remains except an old farmhouse, all the rest having been swept away, apparently for business purposes. Excepting for the accident of birth, however, Moorfoot had little to do with Kemp, as on the day on which the future architect was born, he and his mother had to be carried to Newhall. This was due to the fact that their cottage and the other cottages in the hamlet had on that very day to be given over to a squad of miners. Young Kemp received his education in the parish school of Penicuik, but his school studies were carefully supplemented by home tuition. His father, although a shepherd, was a man of considerable intellect, well read and eminently pious, and he supervised the studies of his children and trained their minds, much as William Burness did those of his family. Indeed, in many respects the father of the architect was similar to that of the poet; and one of Kemp's sisters used to say that the "Cottar's Saturday Night" was just a picture of what was to be seen in their own household.

Kemp was apprenticed in his fifteenth year to a carpenter at Redscarsland, a village between Eddleston and Peebles, and served faithfully for four years. During that time he had made a visit to Roslin Chapel, which he had seen with delight several years before, and carefully studied all its details, thus unconsciously beginning his real life work. When his apprenticeship was over he tramped to Galashiels, and "struck a job" there, as they say in America. His employment made it necessary for him to travel considerably to make repairs and other work. Mechanics in those days—there were no railways—had to tramp around on shanks naigie, unless when by chance they got a "lift" part of the way in a cart. Kemp's journeys on foot, however, were the best helps he could have got, as they made him acquainted with such grand old ruins as the abbeys

of Kelso, Dryburgh, Jedburgh and Melrose. With the last he was particularly struck, and he knew the design, the purpose, and even the sentiment of every stone in it better than any man in Scotland in his day or since. Melrose and Roslin were, in fact, his two ideals of architectural beauty. Had it been deemed advisable to have restored Melrose to its old beauty, he would have done the work perfectly. He would have pleased alike the antiquary and the utilitarian spirit of the age, and committed none of the blunders which so long made the work of restoration of old buildings ridiculous.

Leaving Galashiels, Kemp worked for a time in Edinburgh. He carefully studied the ancient architecture with which that city then abounded, and made long tramps about the neighbourhood visiting buildings of interest. Then he tramped into England and visited the famous Minster of York and other structures. Returning to Scotland he worked, always at his trade of a carpenter, in Glasgow, mainly for the purpose of studying its ancient cathedral. Another sojourn in London and a brief journey in France (starting on his continental tour with a few shillings in his pockets) completed his rambling life—his life of preparation.

Returning to Edinburgh, he entered into business as a carpenter; but trade was dull, and he soon gave up the task of making a connection among "Auld Reekie's" builders. His ability as a draughtsman was fully recognised by Mr. William Burn, the most noted Scotch architect of the day, and by that gentleman he was employed in preparing working drawings for the present mansion-house of Bowhill. He also prepared a model in wood of a new palace for the Duke of Buccleuch, which was highly prized by that nobleman, and is still preserved at Dalkeith. Kemp's most important work at this time (1830) was a series of three large and faithful views of Melrose Abbey. "These drawings," says Kemp's relative and biographer, Mr. Thomas Bonar of Edinburgh, "were exceedingly accurate in outline, minute in detail, and so exquisitely finished that they attracted considerable attention in the Scottish Academy Exhibition of that year, and were purchased at a liberal price by Thomas Hamilton, the architect." While making these drawings Sir Walter Scott approached the draughtsman and examined the drawing, but his attention was called from the spot, and in paying courteous attention to some ladies the "Wizard of the North" did not find the opportunity to return. Kemp never failed to regret the ill-fortune that did not permit the great poet to pass judgment on his work.

One of the greatest disappointments of Kemp's life was the treatment he received in connection with the restoration of Glasgow Cathedral. He had fully studied that structure and was thoroughly acquainted with its details. He made and published a series of drawings showing how the old structure might be restored to its former magnificence, and every one of these drawings was simply a carrying-out of the lines of the cathedral as they once actually existed. He also prepared a model of his proposed design in wood, so that the citizens of the "Western Metropolis" who were not architects might see at a glance what he proposed doing. The Government of the day was appealed to and took the matter and the plans under advisement, but hesitated to do anything, and professional jealousy (which exists among architects, apparently, more than any other class of men) raised quite a discussion over the subject. It must be remembered that most of these people looked upon Kemp as a carpenter rather than an architect. The matter for many reasons was dropped for the time, and many years later the cathedral was restored by a London architect. Undoubtedly this man did good work, but a reference to Kemp's drawings makes it very evident that Glasgow suffered a severe loss when these were passed over. He was a mechanic, an architect, an antiquary and a poet, and all these qualities that come under these designations were needed to make a fitting resurrection of the old shrine of St. Mungo.

The great opportunity of Kemp's life came to him in 1838, when, out of fifty-four designs submitted for a monument in Edinburgh to Sir Walter Scott, a drawing which he submitted was one of the three selected as prize-winners. In a subsequent competition he submitted a much more elaborate and finished plan, and it was adopted. That is the monument of which Edinburgh is so proud to-day. Kemp was appointed to supervise the work, and devoted his whole thought to it. The foundation-stone was laid in 1840. Its general design and details were really adaptations of the architect's studies in Melrose, and it deserves the designation which has been given it of being "a poem in stone and lime." Kemp, however, did not live to see the work more than half completed. On the evening of March 6, 1844, while proceeding along the Union Canal to see some stone that had been brought from the quarry for the monument, he missed his footing in the dark, fell into the water and was drowned. His sad "taking off" was deeply regretted, for the man had made many friends by his lovable character, and his great genius was just receiving its merited recognition—was just being discovered and appreciated.

Kemp forced his way to the front through the force of his own genius. If ever there was a self-educated man in Scotland that man was George Meikle Kemp. He enjoyed none of the educational facilities now placed in Scotland within the reach of the poorest. He had no patron to send him to some of the centres of learning. He started the battle of life at an early age, and had to keep steadily on in the grim task of earning his daily bread, and all the knowledge he acquired was the result of hard study, of constant thought, of hours spent with the pencil when mere amusement, perhaps worse, marked the leisure time of his fellow workmen. His life is an example of what Scotch grit, energy, determination and perseverance can attain, and for the sake of the lessons to be derived from that example alone the century of his birth should not be allowed to pass unnoticed.

LIVERPOOL SCHOOL OF ARCHITECTURE AND APPLIED ARTS.

THE Liverpool School of Architecture and Applied Arts was formally opened on the 10th inst. by the Lord Mayor of Liverpool. In the course of his address he said Liverpool as a school of art would perhaps be thought to have but few claims. That would, however, be doing but scant justice to it or to its citizens, many of whom had laboured long and successfully in many departments of art. In 1768 the Royal Academy was founded, and in the following year, when the population of Liverpool was but 34,000, a society was formed for the protection and encouragement of the art of painting and sculpture, which, however, lasted but a short time. A second society was within five years founded in which architecture, anatomy, perspective and chemistry were taught, and one of its members was their illustrious townsman, William Roscoe. The principal object of that society in their own words was "to assist youths in their studies to the best of their power without expectation of pecuniary advantage." That society lasted only two years, but during its brief existence a public exhibition was held and eighty-four pictures were hung, and it was interesting to note that among the amateur exhibitors were members of the Rathbone family. It was very encouraging to observe the persistent effort to take part in and assist the revival of art which had now set in, and which was perhaps for almost the first time in its history bringing this country into prominence. The next society was founded in 1783, having the same object in view, the encouragement of painting and the allied arts, and of that society William Roscoe was vice-president. Classes were formed for the instruction of art students, who were admitted free of charge. An exhibition of the society was held in 1784, which was probably the first ever held in a provincial town. A large building in Rodney Street was utilised for that purpose, and among its exhibits were two contributions from Sir Joshua Reynolds. In the preface to the catalogue a graceful tribute was paid to that illustrious painter, "because he has not thought it improper to favour the society with his performances, a circumstance which, whilst it dignifies this undertaking, reflects the highest honour on his candour and politeness." That society, too, shared the fate of its predecessors and was brought to a close by the outbreak of the French revolutionary war and the revolt of the American colonies, which seriously interfered with the prosperity of Liverpool. In 1810 the Liverpool Academy was formed and William Roscoe was again one of its members. The Liverpool Academy was therefore the oldest institution of its kind in the country, with the exception of the Royal Academy and the Royal Society of Water-Colour Painters. In 1811 Mr. Henry Blundell, of Ince, one of its patrons, died and left the sum of 1,600*l.* towards the establishment of an academy of art. On the opening of the Royal Institution in the following year that amount with accumulated interest was handed over to the trustees on the understanding that the academy should be housed in the institution buildings for ever, and up to the present time the academy had held classes there for instruction in art. In 1831 a "society of gentlemen of taste and opulence" was formed for the encouragement of the fine arts; the Mayor and Mr. Thomas Brancker were among the number. Prizes were given at the academy's exhibition, first by the Corporation and then by the society, who on seven different occasions awarded a prize to the pre-Raphaelite school, which, being the first recognition of that school, created so much opposition and dissatisfaction that the academy succumbed to it about 1862. In 1871, by the efforts of Sir James Picton, Alderman Samuelson and Alderman Philip Rathbone, the present Autumn Exhibition of pictures was established, and during the coming autumn its silver anniversary would be celebrated by the holding of the twenty-fifth annual exhibition. As a result of those efforts Liverpool possessed one of the finest—perhaps the finest—collection of works of art in the provinces. The Walker Art Gallery was formally opened to the public by the Right Hon. the Earl of Derby in 1877, new rooms were added in 1884, and at the present time additional accommodation was

urgently needed to display the growing collection of art treasures. But Liverpool had done something more than this for art. Some of her citizens, following the example of William Roscoe and those associated with him, had spent time, effort and money in the teaching of art. The Government School of Art founded in 1852, the outcome largely of the impulse of the Great Exhibition of 1851, and the Government Normal School of Design, the first national effort to foster art, was immediately taken hold of by them. The art classes of the Liverpool Institution were formed in the years 1833 to 1840, and so successful were they from the first that as far back as 1842 they were attended by more than 400 students in mechanical drawing, architectural drawing, naval architecture, landscape and perspective, painting and modelling. These classes in 1855 were formed into a Government School of Art, in which their usefulness had been immeasurably increased. A noble and imposing building attached to the Liverpool Institute had been erected, the generous contribution of one of Liverpool's noblest sons, one who was credited with a vastly nobler act of generosity to this city within the last few days, a generosity that far and away distanced any previous similar act of philanthropy in its history. Liverpool owed much to its public men, but to none did it owe a deeper debt of gratitude than to him who, through many years of quiet, unostentatious and persevering effort, had laboured to advance the education, the culture, the well-being and the happiness of the inhabitants of this great city. Architecture as a branch of art did not appear to have received the encouragement its importance demanded, but Liverpool could boast of not being altogether behind even here. The Free Public Library possessed upwards of 1,000 volumes of books connected with the architectural school, which must be of immense advantage to students. Liverpool, too, could boast of many choice specimens of architecture. St. George's Hall was a building of which Liverpool might well be proud. It stood a unique specimen of civic love for art, it had furnished an object lesson for all students, and it had encouraged and elevated the taste of the municipality, and its effect might be seen in the architecture of the city generally. The school which was to be formally opened that day in that building would be inaugurated under most favourable conditions. Other men had laboured, and his hearers were about to enter into their labours. Hitherto the funds necessary for that work had been furnished mainly by private philanthropy; now the Government grant in aid of technical education would be available, and the status of that University would add greatly to its efficiency. It came at an opportune moment. Education was vital to the interests of the nation. A fierce competition lay before them, and it was essential that the rising generation should be fully equipped to grapple with it. The responsibility and the honour of that work was in their hands, and they all felt that its success was assured. He had great pleasure in formally declaring the school open, and calling upon Mr. T. G. Jackson, A.R.A., to deliver the inaugural address.

Mr. Jackson said the establishment of such a school as that under the combined auspices of the city and University could not fail to influence in one direction or another the current of artistic education not only in Liverpool, but in the country at large. Efforts to a certain extent resembling theirs were being made in other places throughout the land. Technical schools and institutes were rising up, and were substituting new methods of training for those to which hitherto they had been accustomed. Their scheme, too, had many features which distinguished it from others, and gave it a special interest in the eyes of the rest. While their students would learn the work of different handicrafts and the principles of construction, they would also be trained to consider the æsthetic result of what they were doing—to design work which was not only well considered and well put together, but beautiful, and not only beautiful but beautiful in the best way, expressing outwardly the ideas and methods by which the work had been produced. Dealing with the necessity for the artistic element being embodied by the architect in his work, he said artistic instinct was born in a man, and could not be imparted if he was born without it. Unless a man was born with an artistic temperament, it was useless of him to attempt an artistic career; but though a man might be of the right material to begin with, training and education were required to enable him to use his natural gifts to advantage. Like all experiments, this new school had advantages which should not be overlooked. The whole system of teaching crafts was still in the experimental stage, and they were still in the dark as to what would come of it. Alluding to the technical education schools supplementing the old system of apprenticeship, he expressed the conviction that no training in schools would ever give an architectural pupil the same insight into the proper conduct of his work as that which he would get in his master's office, and in this connection he contrasted the training which architects received nowadays with that obtained by those who built our great cathedrals and other historic buildings, and who took an active part in the raising of the structures. The modern archi-

tect, he said, resembled the professional man and designed his buildings on paper from a distance, and under the present system he was seldom brought into contact with the materials that were used in building. That was especially the case with learners, but by means of schools such as the one they were opening that day he would be brought into contact with those materials, and he would come to the task of designing with a stock of ideas and a capacity for invention not to be got in any other way.

Sir W. Forwood, as chairman of the library, museum and arts committee, which had been associated with University College in the inauguration of that school, proposed a vote of thanks to Mr. Jackson for his address. The necessity for a school of architecture was fully made out, and he was glad to think that it had been generally welcomed by the public of Liverpool. They had been very fortunate in securing a professor of the eminence of Professor Simpson, and if the public demanded that their houses should be better finished and better designed they would quickly fill the school with apt pupils who would be trained to carry out those works. That school was indebted for its inception to Mr. Philip Rathbone.

Alderman Rathbone, in seconding, said he should have wished the school had been called the School of Architecture and "Allied," and not "Applied," Arts. As a consequence of the improvements in machinery they were constantly liable to gluts of cotton, gluts of corn and gluts of various products, but there could be no glut of beauty. Every fine building erected did not displace or render needless some other fine building. They had come to the age of civilisation, and they had to rebuild the whole of their towns to make them in any way worthy of the towns that were built 500 years ago. They could not create genius, but they could give genius an opportunity of showing what was in it.

Mr. Jackson, in replying, wished success to the new school, and said he hoped to hear great things of it.

THE NEW VELASQUEZ.

AMONG the latest presents to the National Gallery is a painting by Velasquez from Lord Savile. His lordship gives the following account of the work:—

It was for some years in the possession of Sir Edwin Landseer, by whom it was exhibited at the Old Masters' Exhibition of the Royal Academy in 1873, under the title of "Signing the Marriage Contract between the Infanta Margarita Maria, daughter of Philip IV., and the Emperor Leopold." This designation, however, was incorrect, for that event took place in 1664, four years after the death of Velasquez.

It is evident that this painting does not represent the betrothal of a Spanish Infanta, who, even as a mere child, was a very important personage, as is seen in the celebrated picture by Velasquez, called "Las Meninas," where the little Infanta is attended by two maids of honour, a lady in waiting, a chamberlain, an equerry, and two dwarfs; whereas in the National Gallery picture the child is accompanied by a single female, probably its mother. There is nothing in the picture to connect the scene with royalty, and it is evidently the representation of a betrothal in a private family, probably that of Velasquez himself.

If this surmise be correct, the principal male figure would be Velasquez as a Knight of the Order of Santiago, the red cross of which, though half concealed, is seen on his cloak; the mother presenting her child would be his daughter, the wife of the artist Del Mazo, his pupil and son-in-law, and the girl their daughter, the grandchild of Velasquez.

The foreground is occupied on the right by a half-length figure of the poet Quevedo, with a huge pair of horn spectacles, as he is represented in his portrait by Velasquez at Apsley House, though here he is a much older man. He was a great friend of Velasquez, and in this picture may represent the witness to the betrothal of the artist's grandchild. On the right is a negro, probably Juan Pareja, the favourite slave of Velasquez, who is conveying a basket of fruit to his young mistress. Velasquez himself is waiting, pen in hand, for the "promesso eposo," who, though not shown in the picture, may be entering the room by the *portière* which an attendant is raising; but he is seen by the little bride elect, who waves a salute to him with the flower in her hand.

It is not surprising that a painting of this unusual character should give rise to doubt as to the correctness of its attribution, and it has been suggested that it is the work of Del Mazo, the pupil of Velasquez; but if that artist had been commissioned to paint the portrait of a knight of Santiago, his sitter would scarcely have been satisfied with the scanty indication of that celebrated order shown in this picture. If however, as I believe, the knight of Santiago represents Velasquez himself, the half-hidden cross of that order assumes an aspect that may have an important bearing on the questions of the authorship of the picture, the date of the work and the cause of its being

unfinished. Stirling Maxwell, in his admirable and exhaustive "Annals of the Artists of Spain," relates that Philip IV. in 1658 conferred on Velasquez the habit of the Order of Santiago; but it was not for many months later that the artist was invested with its insignia, owing to the formalities required by the Order to prove his pedigree. The king, impatient at this delay, sent for the President of the Order and the documents connected with the case, and having looked at them, His Majesty said to the President, "Place on record that the evidence satisfies me." The half-concealed red cross of Santiago in the picture was sufficient for Velasquez to show that he was entitled to the Order, but, with the modesty and conscientiousness that distinguished him, he did not design the insignia on his breast, where it is worn, apparently not feeling justified in so doing until after his investiture. This, however, did not occur till November 1659.

It is evident therefore that the picture must have been painted in 1658, after he had received the habit, but not the insignia, of the Order. That the picture was left unfinished was doubtless due to the onerous duties with which Velasquez was charged by the king in preparing the meeting on the Bidassoa in 1660 of the French and Spanish courts, to celebrate the nuptials of Louis XIV. and the Infanta Maria Teresa.

These duties doubled the official fatigues and shortened the life of Velasquez, who died shortly after his return to Madrid in August of the same year.

There is therefore good reason to believe that the picture in the National Gallery is the last ever painted by Velasquez.

THE CHICHESTER MARKET CROSS.

THE following report on the proposed restoration of the market cross in Chichester has been sent by the Society for the Protection of Ancient Buildings to the Town Council, and will be considered at to-day's meeting:—

9 Buckingham Street, Adelphi, W.C.

To the Worshipful the Mayor of Chichester.

Sir,—Upon returning here after meeting your committee on the 7th inst. I have reported to the committee of this Society the state in which I found the market cross. It was also with great pleasure that I informed my committee of the honour done to this Society by the courteous reception which I met with. I am now directed, by the committee of this Society to say that it is most anxious to give your committee every possible assistance, and in accordance with your requisition to make the following statement with regard to the treatment which it advises should be followed with respect to the market cross.

1. *Hoarding.*—That a close hoarding be erected all round the cross so that the covered cross may be used for materials, &c., and also to allow the work to progress without interruption.

2. *New Clock.*—That as soon as it is decided to carry out the work of repair, a good clockmaker be asked to furnish plans and estimate for providing a new clock, and that he be given clearly to understand that he must arrange his works so as to necessitate no further interference with stone or timber-work.

3. *Covering.*—That a temporary covering should be formed by felt or tarpaulin being placed over the backs of the flying buttresses.

4. *Roof.*—That the existing lead and boarding be removed, and the brick piers standing on the vaulting and now partly supporting the timbers should also be removed, and the timbers of the roof rearranged so that their bearing comes directly upon the central shaft at one end and the external enclosing wall at the other. That the external wall should be secured to the timbers by some such means as copper bolts and straps, so as to prevent any outward movement. Probably all the existing timbers (which appear sound) can be reused, but any new timbers required should be well-seasoned oak, free from sap and of English growth. Probably also the same boarding can be reused, but if not, new boarding of a similar description should be used. Oak boarding must not be used, as the tannin in it will decompose the metal.

5. *Flying Buttresses.*—That only one flying buttress should be dealt with at a time, and it should be carefully supported on temporary centreing, and then that all the existing ironwork should be removed and replaced in a similar manner with copper, care being taken that a better fixing is given to the lower end of the main strap, which in all probability would be better if taken lower down.

6. *Niches between Clock Dials.*—That the iron straps be removed from the backs of the four niches between clock dials and replaced with copper, unless some better form of tie can be devised. The pinnacle over the north-west niche it will probably be wise to temporarily remove.

7. *Iron Rods to Vanes.*—That if the iron rods to the vanes can be extracted from the finials without damage to the stone,

they should be replaced by copper rods, but rather than destroy the stonework it would be better that they should remain.

8. *New Roof Covering.*—That the roof be re-covered with stout copper or cast lead. If possible the sheets should not exceed 3 feet in width and 8 feet in length, and the lead should be cast not less than 9 lbs. to the square foot. Cast lead can be obtained from Rowe Brothers & Co., Canon's Marsh, Bristol.

9. *New Down Spout.*—That a new circular copper down spout may take the place of the existing down spout, and that it be provided with a plain square copper head.

10. *Stonework Generally.*—That every fine crack in the stonework which does not exceed an eighth of an inch in width should be carefully run full of liquid cement, care being taken to syringe out with clean water all foreign matter as far as possible. That where ornamental features have gone no attempt should be made to put imitative ornamental features in their place, but, on the other hand, that where ornamental features are loose they should be secured with fine copper bolts and cement, or other reasonable means which those entrusted with the work may be able to devise. Their instructions are that they should interfere with the present aspect of the cross as little as possible, and on the other hand that they should use all their skill and knowledge in protecting it from further decay. The committee is sorry that it cannot do more than speak in general terms of what repairs should be done, because it is of opinion that a just decision on each point can only be arrived at as the works proceed, but it suggests that where a stone has decayed to a considerable depth, say $1\frac{1}{2}$ inches to 2 inches, it may be advisable to cut the surface of such a stone back sufficiently far to get at the unaffected stone, and that then having thoroughly wetted the surface the stone should be made out to the original face with a plaster composed of blue lias lime and sharp coarse-washed sand in the proportion of three of sand and one of lime.

11. *Bell fêche.*—With regard to the central bell fêche the committee would urge most strongly the importance of not altering it. In its opinion the design is good, but whether good or bad it would still urge its retention, for time has toned it down in harmony with the rest of the work, and any new work could not acquire similar quality in our lifetime. Moreover, to alter any portion of the cross as it now stands would only court disagreement as to the form which the new work should take. Again, whether it is intended to use the bell for the clock to strike upon or not, the committee would still urge the retention of the bell in its present position, inasmuch as it helps to explain why the finial of the cross was designed in this form, and if it were removed too much light would show through the openings.—I am, sir, your obedient servant,

THACKERAY TURNER, Secretary.

May 10, 1895.

EDINBURGH ARCHITECTURAL ASSOCIATION.

THE members of this Association made an excursion to Paisley on Saturday, for the purpose of visiting the old abbey and the Coats Memorial Church. They arrived in Paisley shortly after two o'clock. Their first visit was to the abbey, and they were there received and welcomed by the Rev. Dr. Gentles. The party at once entered the church, where Mr. Hippolyte Blanc, Edinburgh, read an interesting paper on the abbey. He devoted the first portion of his paper to the historical incidents connected with the old building. These he dealt with in an interesting and instructive manner, making special allusion to the founding of the abbey in 1163, to the favours conferred on it by the Stuarts and others, and to the position the Paisley church occupied in the old ecclesiastical affairs of Scotland. Then he considered the attraction and the beauty of the venerable edifice as centred in its architecture. As he proceeded with his observations he directed attention to the special features with which he was dealing, and pointed out the architectural beauty still manifest in various parts of the church. He also traced, with the assistance of a plan, the extent of the original buildings, and expressed the hope that the time was not far distant when the abbey would be restored in a manner in keeping with its old stately grandeur. The company afterwards visited various places of interest attached to the abbey, such as the ruins of the altar, the choir, &c.; St. Mirin's chapel, or "sounding aisle," which contains the tomb of the Princess Marjory, the daughter of the great Bruce, and the mother of the first of the Royal Stuarts. A visit was also made to the memorial erected by Her Majesty the Queen (following her visit to Paisley in 1888) to the memory of the members of the royal house of Stewart who are buried in the Paisley Abbey. The memorial is placed in front of the ruins of the altar. Before leaving the abbey grounds a vote of thanks was, on the motion of Mr. Blanc, accorded Mr. Gentles for his kindness in receiving the deputation that afternoon. The party afterwards made their way to the Coats Memorial

Church in the High Street. In one of the ante-rooms attached to the large church hall Mr. Blanc had the ground plans and elevations of the general building arranged. From these he explained the principal features of the work represented in the entire undertaking. Whilst pointing out the elaborate and intricate nature of the work in connection with the spire, he took occasion to pay a high compliment to Mr. Alexander Scott, the clerk of works on the buildings, for the thorough and efficient manner in which he had attended to the general operations. An imperfect stone or one carelessly placed might have seriously affected the lantern or crown of the spire, but this had been carefully guarded against by Mr. Scott, and he (Mr. Blanc) was glad of the opportunity to make that statement. Mr. Blanc next led the company through the several passages and rooms of the building, and then took them into the interior of the church. At some length he explained the arrangements adopted for the chancel or choir recess. In this connection he stated that the primary conditions to be observed were to have the building and the chancel or choir recess, of course, in harmony with the worship of the Baptist denomination. These conditions, he believed, had been carefully observed, and he thought he might say so, even in face of the carping criticism of a member of the Ecclesiological Association of Glasgow. The company afterwards ascended the spire, which rises to a height of about 200 feet, and from one of the balconies they had a splendid view of Paisley and the surrounding country. At the close of the inspection of the memorial church, Mr. James Bruce proposed a hearty vote of thanks to Mr. Blanc. As their leader and guide for the day, he said, Mr. Blanc had provided them with a splendid intellectual treat. In the old Abbey of Paisley he had brought before them the beautiful architecture of a bygone day, and now he had made them familiar with the architectural features of one of the finest modern ecclesiastical buildings in the country. As its architect Mr. Blanc had in the Coats Memorial Church produced a splendid building. But this was only what had been expected from him, considering the culture of his mind, his familiarity with the great types of continental architecture and the reverential and devout spirit he brought to bear on all his work which was to be devoted to the service of God. Mr. Blanc suitably acknowledged the vote of thanks accorded him, and the company left Paisley for Edinburgh shortly after six o'clock.

SHETLAND PLACE-NAMES

A LECTURE on the old Shetland place-names was delivered last week at Lerwick by Mr. Jakob Jakobsen, of the University of Copenhagen, who has been in Shetland for nearly two years gathering the remains of the old Norse language, with the view of preparing an etymological dictionary of the same. The lecturer remarked that the first thing that struck one about the Shetland place-names was their great abundance. No matter how small a patch of ground it was it had its distinctive name. The small island of Fetlar alone contains no fewer than 2,000 place-names. The great majority of these names were derived from the Norn or ancient Norwegian language. While the old Norn speech gradually gave way before Scots and English, and the old conversational terms became supplanted by new, the place-names maintained their ground. The reasons for this, Mr. Jakobsen remarked, were not difficult to find. Place-names are not so liable to change as conversational words. One particular name through time sticks to one particular spot, so the connection between a name and the place it represents is far closer than the connection between a conversational word and the article it represents, as the word is applied to any article of that particular kind. No old Shetland place-names, it was remarked, can be traced to any other language than the Norn; but still it is possible, through a study of the Norn place-names, to get a peep at an earlier period. They found the settlements of the ancient Irish missionaries, the papal popes or culdees, recorded in such names as Papa Stour and Papil. Mr. Jakobsen, in this connection, entered into an interesting discussion as to whether the people amongst whom these early missionaries laboured were really Picts, of whom there are many myths lingering in Shetland. In the course of his researches he had come across several place-names, regarding which, as bearing on the debatable question of a Pictish occupation, scholars will be much interested. The lecturer went on to speak of the times of the Finns and the Trows, giving instances where the names of these occur. Afterwards he turned to the more common kinds of place-names, beginning with the class which is by far the most comprehensive—that is, the one containing places named according to the form of the land. Most of the Shetland place-names contain in themselves a description of the places they are applied to. This class the lecturer divided into subdivisions, taking first the various kinds of inland heights, hills, braes and hillocks; then the level ground, and the various kinds of valleys, glens and hollows; then the formations of the

shore; then the various indentations of the sea, and finally, the small islands and rocks in the sea along the coast. All these various names were detailed and explained, the lecturer concluding with an examination of the name Zetland, the derivation of which is very doubtful.

A MEGALITHIC VILLAGE IN ALGERIA.

IN his new report on Algeria Sir Lambert Playfair describes a visit which he made to the phosphate mines of Djebel Dyr, near Tebessa, in the course of which he says he saw a wonderful megalithic village. At about a kilometre from the house of the manager of the mines the mine tramway runs along the base of a cliff of shell limestone about 240 feet high. Below is a grassy slope covered with stones and boulders which have been detached from the hill above. Some of them are of great size, being 11 or 12 mètres in circumference, and they have been hollowed out into chambers about 2 mètres square at the base. A ledge of 30 centimètres square has been left on all the four sides, and the centre has been further excavated to a depth of about 10 centimètres. Windows have been cut in the sides, and one can clearly see the groove into which a door was fitted. The interior height of the chambers is about 2 mètres. The boulders are of shell limestone not very difficult to cut, but still so hard that the pick marks in the inside are as sharp as when first made. On the summit of the hill above are megalithic tombs of the ordinary type, large slabs supported by upright stones. Sir Lambert cannot quite make up his mind whether these excavated boulders are habitations or tombs like the others. The fact that undoubted tombs exist in the immediate vicinity at what would naturally be considered the proper distance for the cemetery of a village induces the belief that the boulders may be habitations. They are provided with windows, and the groove for the door only exists to half its height, leaving the upper half of the aperture to be shut by a curtain or hanging of some kind. Some of the windows are rudely made; one was a nearly perfect ellipse placed high up in the wall so as to serve also for a chimney. The interior dimensions are not much less than many of the native huts at the present day. The balance of evidence appears to him in favour of their having been intended as habitations.

DUNDEE INSTITUTE OF ARCHITECTURE.

A MEETING of the Dundee Institute of Architecture, Science and Art was held at the Albert Institute on Monday night. Ex-Bailie Keith, the president, occupied the chair. The result of the drawing competitions of the Institute were announced. For perspective sketch of an architectural subject there was only one entry, by Mr. James Williamson, County Buildings, Cupar Fife, who showed a fairly good drawing of a gate lodge. In the class for measured drawings there were four competitors. Mr. Charles Soutar, 104 Commercial Street, was first with a firmly set and carefully manipulated drawing of Dairsie Church. The second place was taken by Mr. Andrew Hutton, 16 Annfield Street, his subject being the Girls' High School, Dundee. Mr. Hutton did not show the same firmness in his work as Mr. Soutar, but he exhibited a considerable amount of refinement in details. For perspective sketch in pencil of a memorial tomb in a church there were two entrants, and both chose the same subject—Bishop Forbes's tomb in St. Paul's Episcopal Church, Dundee. The prize was awarded to Mr. W. B. Black, 12 Hawkhill, for a capital piece of work. Mr. D. P. Grubb, 5 Osborne Place, was easily first in the water-colour sketch class with a painting of *Leuchars Church*. The picture shows much artistic merit and considerable latent power, its only weakness perhaps being that it was rather delicate in colouring. Honorariums were awarded to Mr. John Gray, 4 Baxter Park Terrace, for his *Landscape*, and to Mr. Alexander Malcolm, 6 Forfar Road, for *On the Eden*, both meritorious pictures. There were two competitors for the best sketch from an antique subject in the Dundee Art Museum of Casts. The prize was awarded to Miss Bella Fraser, 9 Ward Road, her subject being *The Slave*. The other competitor, Mr. Allan Inglis, 26 Isles's Lane, exhibited a drawing of the figure of *Bacchante*, which, though more firmly drawn than *The Slave*, lacked the winning picture's softness and roundness. The judges of the competition were Provost Orchar, Broughty Ferry, Mr. A. C. Lamb and Mr. T. S. Robertson. The drawings will be on exhibition in the South Kensington Room during this week. The Institute afterwards nominated the Council for the ensuing session as follows:—President, ex-Bailie Keith; vice-president, Mr. Leslie Ower; members of Council, Messrs. James Foggie, T. M. Cappon, W. Nixon, John Macfarlane; hon. secretary and treasurer and librarian, Mr. J. J. Henderson; auditors, Messrs. James Hutton and Frank Salmond. Mr. Robert Little, architect, Kirkcaldy, was elected a member of the Institute.

THE VENICE EXHIBITION.

IT is stated by a correspondent of the *Scotsman* that the whole number of pictures admitted into the Art Exhibition is 500. These have been drawn from the studios of the leading artists of every nation in Europe, and they have been arranged in the exhibition rooms according to the nationalities of the artists. There are ten rooms in all, each nation having as a rule one, although Italy, having about 200 pictures out of the 500, has more, whilst France and Spain, having sent comparatively few pictures, have but one between them. The atrium is devoted to sculpture, and the very first room opening off it is the English one. A pleasing and instructive feature of the exhibition is the contrast the different art-schools of Europe here brought together present. Whilst the pictures may be equally meritorious, the difference in subject, conception and execution is very striking. Every school has thus its own peculiar interests. The Italian pictures suggest rapid and easy execution, in contrast to the English ones, which speak of thought and labour. The Norwegian are like Japanese in their quaint outlines and colourings, whilst there is a brilliant dash about the French and Spanish, but something not altogether pleasing in them. The subjects of the pictures are suggestive of the countries of the authors, and of the habits and customs and modes of thought of their respective peoples. These characteristics are so marked that if one found an English-looking picture in an Italian room, or an Italian-looking one in the Greek room, one was safe in saying the Italian artist had been trained in England or in Greece. A few of the pictures that attracted particular notice were the following:—*La Calma*, a lake above Belluno, amongst the wild dolomites, by Millo Bartoluzzi; *Return to His Native Country*, by Giovanni Sgantini, a young artist who was early left an orphan, and who began his life's work by drawing on stones whilst herding cattle in the fields; *Giorno di Magra*, a picture of the Piazza of Santa Margherita in Venice on Friday, when the fish market is in full swing; *Parabola*, by Cesare Laurente, which shows two houses with outside stairs and a terrace—up the one stair a youthful party go with gaiety and laughter, whilst the same figures, sobered with age, are seen descending the other one. An artist who lives "far from the madding crowd" in the Abruzzi mountains has painted with much strength a legend of his country, called *The Daughter of Iorio*. Domenico Morelli, an Italian senator, has two portraits and a *Temptation in the Wilderness*. Two pleasing pictures by Pietro Fragiaco are *Un Saluto*, which shows two boats saluting each other on the open sea, and *Tristezza* (sadness), which shows a mountain hamlet and a disconsolate maiden by the wayside. *Hammer-smith*, an *Autumn Evening* and *The Madonna with Angels*, by Aristide Sartorio, were much admired. They had an English look about them, and the artist was trained in England. His conception of the Madonna contrasts with those of Italian artists. The Spanish artist José Villegas is represented by a large canvas, *The Coronation of the Dogress Foscari*. The pictures of the German artists Max Liebermann and Ludwig Deltman, *The Market of Haarlem*, *The Labour*, the *Arrival of Humbert I. at Berlin*, created much interest and remark. Of the pictures in the English room much admiration was expressed. Millais's *Last Rose of Summer*, Holman Hunt's *May Day Morning on Magdalen Tower*, Oulless's *Portrait of G. H. Pember* excited much enthusiasm. King Humbert bought pictures to the value of 50,000 francs (2,000*l.*).

THE NATIONAL TRUST.

THE first annual meeting of the National Trust for Places of Historic Interest or National Beauty was held on the 9th inst. at the Examination Hall, Savoy, under the presidency of the Duke of Westminster. The report showed that the Society has already done some practical work. It has become the recipient of a picturesque cliff overlooking Barmouth, which has been presented to the nation by Mrs. Fanny Talbot. With reference to Carlyle's house at Chelsea the provisional council of the Trust has issued an appeal to its members for help, recognising that the work of the Carlyle's house preservation committee was cognate with its own. Efforts were being made to secure Alfriston Old Clergy House, near Eastbourne, Roman remains at Bognor, on the South Downs; the Fall of Foyers, in Inverness-shire; and the site of Bute House, Petersham. It was the intention of the council to prepare a schedule of places requiring preservation, and it would be glad if members would assist the work by forwarding the particulars of any places they might meet with which they considered should be preserved for the nation.

The Chairman having referred to the enthusiastic meeting at Grosvenor House when the Trust was formed, remarked he had little to say on that occasion, as they had hardly got into harness. But he thought it must be satisfactory to know that

an excellent start had been made with the cliff at Barmouth and the old Clergy House, which he supposed was one of the oldest timber houses in the country. It must not go out to the public that they did not want funds, which were, in fact, needed for the repair of the places held by the Trust. It might be possible to purchase, but there was this risk, that if they gave out they were a purchasing society it might lead to misunderstanding. At any rate it would have to be done with discretion and tact. He moved the adoption of the report.

Sir Robert Hunter seconded the resolution, and pointed out that as far back as 1865 the existence of such a Trust would have been invaluable to the nation. At that time the Lord of the Manor of Banstead was anxious to make over the Downs to the public. There being no authority then to accept that open space it was eventually closed. That led to expensive litigation before the Downs were again thrown open to the public. He gave an account of a kindred society which exists in Massachusetts, and through which several picturesque open spaces had been secured to the public.

The report having been adopted, Miss Octavia Hill moved a vote of thanks to the donor of the cliff.

GENERAL.

A Deputation from the Society of Antiquaries of Scotland visited Annandale a few days ago to inspect what are represented as Roman camps. The visit was with a view to advising the Council of the Society whether to proceed with excavations at these reputed Roman camps. Birrens camp, which is represented to have been the winter quarters of the Romans, and where there are distinctly-marked ramparts and fosses, was first inspected, and the party then drove to Burnswark Hill, upon the slopes of which are distinctly seen two large and two small camps.

The Exhibition of the Glasgow Institute of Fine Arts closed on Monday evening with a promenade concert.

Mr. Francis Taylor, late of Howe, who has just died at Kirkwall, has left the residue of his estate, amounting to about 1,000*l.*, to be expended on the repair of St. Magnus Cathedral.

An International Exhibition or World's Fair was opened at Amsterdam on Saturday by the Grand Master of the Ceremonies, who was deputed to act in the absence of the two Queens.

The Plans prepared by Mr. Robertson, of the Office of Works, Edinburgh, for the new Post Office in Dundee, have been sanctioned.

Mr. H. G. Quartermain will read a paper on "Sussex Churches" before the Society of Architects on Tuesday next. We hear that the author proposes to deal in considerable detail with the remarkable churches at Old and New Shoreham, and the famous Saxon church at Worth. Limelight views will illustrate and accentuate the interest of the subject.

Mr. Ernest Hart, D.C.L., will deliver on Tuesday, the 21st inst., at the Society of Arts, the first of his series of Cantor Lectures, on "Japanese Art Industries."

The Finance Committee of the Liverpool Corporation have advised the grant of land and money to the amount of 15,000*l.* to the Northern Hospital committee, so as to provide an adequate site for the rebuilding of the hospital on an enlarged scale.

Mr. Waterhouse, R.A., as treasurer of the Artists' Benevolent Institution, announced at the dinner on Saturday that Mr. J. S. Montefiore had offered a house on the East Cliff, Ramsgate, as a temporary home for distressed artists. The subscriptions and donations for the year amounted to 2,427*l.* 10*s.* 6*d.*

A Market Cross is about to be erected in Arundel on the site of the existing town pump.

A Lecture on "The Early Renaissance in England" will be delivered in Cambridge on June 13 by the Bishop of Peterborough, who is Sir Robert Redes lecturer for the present year.

Mr. Arthur Baker, F.R.I.B.A., of the firm of Messrs. Baker & Turrill, of Effingham House, Arundel Street, Strand, and Mr. Richard P. Day, A.R.I.B.A., of 20 John Street, Adelphi, have been appointed surveyors of dilapidations in and for the diocese of London, in accordance with the Ecclesiastical Dilapidations Act of 1871, to fill the vacancy caused by the recent death of Mr. Gordon M. Hills, who held the appointment as sole surveyor for the diocese since 1871.

The Designs submitted by Mr. George Baines, 4 Great Winchester Street, London, E.C., have been selected in the open competition for a ladies' college in North London, and he has been instructed to obtain tenders forthwith. Accommodation is provided for seventy resident pupils, with dining-hall and principal's house.

The Architect.

THE WEEK.

THE buildings which are most interesting from a lawyer's point of view are those which are of a nondescript or a dual character. A case relating to one was before the Lord Chief Justice and Mr. Justice CHARLES on Monday. The owner of a private school at Lindfield, in Sussex, proposed to erect a sanatorium, and he duly advised the Cuckfield Union Sanitary Authority of his intention. The plan showed a building with walls of galvanised iron lined with wood, an iron roof, wood floors with concrete under them and brick foundations. The Authority declined to sanction the erection, whereupon the schoolmaster commenced operations. He employed sheets of corrugated galvanised iron, one thirty-second of an inch in thickness, with a layer of felt inside three-sixteenths of an inch in thickness, fixed to the outside of a framework of wooden uprights and horizontal posts and rails, the sheets being fixed to each other where they join by rivets or other metal fastenings. To the inside of the framework was fixed a lining of matchboarding five-eighths of an inch in thickness, and separated from the felt lining by a hollow space of $4\frac{1}{2}$ inches, being the thickness of the posts and rails. The Authority ordered the structure to be taken down, but as the order was not obeyed men were employed to do so, when the owner commenced legal proceedings. It was agreed to allow the sanatorium to remain until the Court decided whether under the by-law such a structure was prohibited, and, if so, whether the by-law was unreasonable. The by-law relied on by the Authority enacts that "every person who shall erect a new building shall cause such building to be enclosed with walls constructed of good bricks, stone or other hard and incombustible materials, solidly put together with good mortar (compounded with good lime and clean sharp sand or other suitable material, or with good cement, or with good cement mixed with clean sharp sand)."

ON Wednesday, judgment was given by the Lord Chief Justice. His lordship said it was remarkable that in the by-laws there was no reference to iron buildings, although they were to be found throughout the country. The by-law on which the Sanitary Authority relied in the present case related to walls of bricks, stone, or other hard incombustible materials. Under some circumstances, iron would come under the latter designation; but the question was whether the wall in question was so constructed. His lordship said he did not propose to give an exact definition of a wall, but he took a wall to be something which would stand by itself. A piece of corrugated iron, one thirty-second part of an inch thick, would not stand that test, and therefore could not be considered a wall. As the framework was of wood, it could not be considered as a hard and incombustible material. There was also a match-board lining. His lordship said therefore he must hold that the work did not form a wall composed of brick, stone, or other incombustible material, and could not be permitted to stand. There was an offence against the by-law, and judgment must be entered for the Cuckfield District Council with costs. The counsel for the owner of the sanatorium asked whether, if the wooden posts were removed and iron substituted, the structure might stand, but the Lord Chief Justice said they had answered one conundrum and declined to undertake another.

A RETURN has been issued of the London churches pulled down or condemned under the Union of Benefices Act, 1860. St. Matthew, Friday Street, is the first. The site realised 22,005*l.*, including 320*l.* for the sale of materials and fittings. Out of the proceeds a sum of 7,420*l.* 17*s.* was expended on the church of St. Thomas, Finsbury. The remainder was spent on endowment, expenses at St. Vedast's, &c. The site and materials of St. Thomas in the Liberty of the Rolls brought 7,102*l.* 16*s.* 6*d.*, and out of the money a sum of 2,713*l.* 5*s.* 6*d.* was appro-

priated to St. Thomas, Kensal Town. St. Olave, Old Jewry, sold for 22,400*l.*, of which sum 11,000*l.* was expended on St. Olave, Stoke Newington. The price obtained for St. Mary Magdalen, Old Fish Street, was 12,700*l.* An Order in Council has directed that 462*l.* be applied to reseating St. Martin, Ludgate Hill, 7,000*l.* for a parsonage house, 6,800*l.* as a fabric fund for St. Martin's, and 6,000*l.* for building a new church. The difference will be paid out of sums received in respect of insurances on the church, which was destroyed by fire. The church of All Hallows the Great, Upper Thames Street, was lately sold for 13,129*l.* 16*s.* The amount to be expended on All Hallows, North St. Pancras, is not yet settled. In addition, 1,000*l.* will be applied towards repairs at St. Michael Royal, and 4,000*l.* towards the cost of a new parsonage. The churches of St. Matthew, Pell Street, and Holy Trinity, Minories, are to be used as Sunday schools; St. Jude, Upper Chelsea, will be a chapel of ease. The removal of human remains and the reinterment have been costly, viz. St. Matthew, Friday Street, 1,179*l.* 7*s.* 10*d.*; St. Olave, Old Jewry, 2,974*l.* 18*s.* 10*d.*; St. Mary Magdalen, Old Fish Street, 2,094*l.* 11*s.* 4*d.*; All Hallows the Great, Upper Thames Street, 1,140*l.* 10*s.* 8*d.*

THE annual meeting of the Sussex Archaeological Society will be held in Eastbourne on July 25 and 26. It is proposed that on the first day the district east of the town should be visited, and the western district on the second day. In that way Westham Church, Pevensey Castle and Church, Herstmonceux Castle and Church, Hailsham, Willingdon, the buildings in Eastbourne (including the parish church, on the pillars of which some interesting fish-markings have been recently discovered), Eastdean, Alfriston, Mitcham, Arlington, Hailsham and Polegate could be seen by the members. A general committee and an executive committee have been appointed to make arrangements for the meeting. As several years have elapsed since the Society met in Eastbourne, old as well as new members will see something novel in the excursions.

THE art unions in this country are based on the principle that individual interests must be supreme. It is a lottery in which every subscriber is sure of something, while a few gain more expensive prizes. The German art unions have a different object in view, which is the encouragement of forms of art which otherwise might be neglected. The Westphalian and Rhineland Union's latest proceedings exemplify what we mean. One-half the cost of a large historical painting in the town-hall of Bochum has been contributed by the Union. The prizes given in the competition for the work also came out of the treasury of the Union. A sum of 10,000 marks has been set aside for the decoration of the ancient church of the Virgin, in Trier, and 3,500 marks will also be given to obtain an altar-piece for an evangelical church at Saargemünd, for in Germany there is not a fear of art among Lutherans. If similar undertakings were supported in this country, the judges would be less doubtful about the legality of art unions and their liability to prosecution.

THE utilising of waste materials in buildings is not always safe. According to the report of the Chief Inspector on Alkali Works in Scotland, one fatal accident has occurred at an alkali work at Irvine owing to the use of tank-waste as a foundation or flooring, over which had been erected tanks for the condensation and storage of muriatic acid. This material consolidates into a hard mass, and is not unfrequently used in alkali works for filling up hollow places and making good the ground level. It is hoped that the use of this material will be avoided in future in places where it is possible that acid liquors may come in contact with it. In the Irvine case a bricklayer, having to effect some repairs to pipes connected with the acid tanks, was overcome by a rush of sulphuretted hydrogen gas caused by an overflow of the muriatic acid on to the bed of tank-waste below. The bricklayer fell to the ground insensible and could not be restored.

PARIS AND LONDON.

WHENEVER a foreign celebrity appears among us he is expected to formulate a theory about JOHN BULL and his island. At one time the terror of the Channel was enough to restrict the number of such visitors. Improved navigation and other advantages now make them indifferent to the voyage. But when theories have in consequence become rather abundant, every day makes it more difficult to produce one about England that will be startling. M. ALPHONSE DAUDET is an example. CHARLES DICKENS, when he visited Niagara, knowing that he could not say anything novel about the effect of the mass of waters on the eye or the ear, accordingly surprised people by announcing that before it one was hushed into perfect peace by the stillness. The author of "Fromont Jeune et Risler Aîné," who is an enthusiastic admirer of DICKENS, appears to have utilised his recollection of the idea, for he has announced that what impressed him most strongly during his visit to London was the silence—the disquieting silence of the millions of taciturn automata who appeared to be passing along the streets like the figures in a dream. Ordinary visitors and residents would not consider that London is a silent city, any more than at Niagara water falls for 160 feet as quietly as it appears to do in a picture. We must, however, allow men of genius to record their sensations, although they may appear peculiar.

London has surprised M. DAUDET by other qualities besides its aphony. There is, he says, too much abundance manifest, and what is worse the abundance is senseless. Our memorials are too numerous. They appear to him as toys scattered at hazard over a plan. There are towers upon towers, statues and pedestals and palaces and colonnades and cupolas and belfries, but they are all out of scale and are not imposing. M. DAUDET's disappointment may, however, be caused by a trick on the part of his guide. When THACKERAY escorted the genial JULES JANIN through London, he introduced all the public statues to him as memorials of WELLINGTON. M. DAUDET is eager to see his countrymen ruled by another NAPOLEON, and who knows whether some wag did not imitate THACKERAY's example. Moreover, in all his travels M. DAUDET could discover nothing to correspond with the Quais of Paris, with the Louvre, or with the Champs-Élysées.

It would be vain to deny that London is not comparable with Paris in offering the combinations of architecture with which a stranger is most impressed. There are no people who are more skilful in the art of making the most of things than M. DAUDET's countrymen. French cooks are amazed at the unworthy results which are produced by such an abundance of viands as they see in London. French journalists are no less struck by the dulness of English newspapers, in which a line may be devoted to a subject that could be so easily utilised for a page, and French municipal councillors have reason to be amazed at the insignificant effects which are produced by an enormous expenditure in rates. The French are economists of time, of money, of space and of materials. In England there is an extravagance in all which the least observant stranger cannot pass over.

As regards the absence of the picturesque effects in cities and towns which are seen abroad, it arises directly or indirectly from our constitutional character. Although co-operation flourishes in England in commercial transactions, it has little power in anything relating to the amenity of streets. The principle itself is unknown among us. On that account we have often thought that to a foreigner there is nothing in Mr. RUSKIN's books which would appear more puzzling than what he says about the effect of "accumulation." Buy pictures and prints, he says, and they are without any collateral effect; they cannot be shown with advantage side by side. But introduce some sculpture on the outside of your house, and let your neighbour do likewise; the two houses will then have an improved appearance, which will be enhanced if three or more houses have also their bits of sculpture, and still more so if the street or the city will combine in the common enjoyment. To a foreigner of average education it would be unnecessary to explain the advantage of that sort of union; he would by instinct feel he was to be a gainer. Unhappily in England Mr. RUSKIN's lesson has yet to be comprehended.

But still less convinced are people about the desirability of laying out streets in a way that brings credit on a town or a district. A project for the simplest street improvement creates a host of opponents. Few people believe that it is not in reality a "job," and only by the exercise of vigorous authority can it be realised. Individual interests are paramount in England, and as long as it is supposed Magna Charta imparts sacredness to every domicile we cannot expect that the vistas which are presented in many parts of Paris can be easily imitated.

It is well also to remember that in Paris the fine architectural effects in the streets, which are so identified with the city as to appear as if they were ordained from the beginning in the nature of things, are of modern origin. M. DAUDET refers to the proportions of the Louvre, but he is old enough to have seen the palace in what might be considered as an embryo state. It was reserved for NAPOLEON III. to perform a feat which all his predecessors from the time of LOUIS XIV. had failed in. A less despotic ruler would have hesitated before realising VISCONTI's plans, and thus bringing the palace into a completed state. Prior to the comparatively recent time when the Rue de Rivoli was carried through its full length, the Louvre was not displayed in a manner becoming its importance, because, as we have said, street effects were not sufficiently valued by authorities or by citizens. That fine building, the Luxembourg Palace, has not yet become the central point which it deserves to be; what is probably the strongest part cannot be properly seen owing to the extreme narrowness of the street on which it abuts. The Champs-Élysées owes much of its beauty to its serving as a suitable approach to CHALGRIN's noble Arc de l'Etoile. But that structure was not completed until 1836, and at an earlier time the view was imperfect. In fact, if the buildings and arrangements which were carried out in the present century could be cleared away and Paris restored to its former appearance, it would not be a very charming capital according to modern notions. Among the works which are to be credited to the nineteenth century are the Madeleine, the façade of the Chambre, which is in keeping with the church, the Bourse, the Palais de Justice, the Vendôme Column, the Column of July, the Place de la Concorde with its obelisk from Luxor, the majority of the great fountains, churches like St. Vincent de Paul and St. Clothilde, not to speak of the numerous structures which have been executed within the last half century, and which are so remarkable as to have transformed Paris. There are still some of the inhabitants, as well as foreigners, who regret the changes, and prefer the Paris of a time prior to 1848, which was to them what the Paris of the sixteenth century was to MONTAIGNE, a place in which something was found in keeping with their individuality, and corresponding with a time in which science had not gained supremacy over art and literature. But the Paris which is traversed by long and straight thoroughfares like the lines of triangulation on a geodetical survey, with "places" or noble buildings as the important points which are determined and connected, which can still claim to be what GOETHE called it, the "geistiger Centralpunkt" of an intellectual world, the Paris of which writers of M. DAUDET's character are enamoured is a modern creation, and it owes its existence to despotism in one form or another.

M. DAUDET therefore comes from a place which has been so much changed during his own life it may be considered as a new city. In London he finds himself in the most conservative of cities. Buildings are altered, but the principal streets continue to present the lines on which they were originally laid out. To a man of his habits it is like passing from light to darkness. The parts of Paris with which he is best acquainted are not to be matched in London. It is natural he should make the most of the contrast, and assume for the occasion the rôle of the representative of Paris if not of France. But it would be well for him to remember that many thousands of the inhabitants of Paris visit London every year who are not startled by the differences between the two capitals. They belong to the class of merchants and manufacturers, the men of business, and as the creators of wealth they are not without importance. They gain their riches in Paris streets which bear no resemblance to the alleys of the Champs-Élysées.

and in quarters which do not recall the very delicate and artistic pearl to which M. DAUDET likens Paris. Those men are disposed to envy their London friends for dwelling in houses that are cleaner and safer, and in streets that are less dismal than those of Paris, in which their own lives are spent. It is well to hear lovers of the ideal rhapsodise about whatever comes near their aspirations; but even despotism cannot make more than one Louvre or one Champs-Élysées in Paris, and it is astonishing how many public buildings there are in that city which would bear enlargement and elevation to the scale which M. DAUDET has recommended for London.

THE OLD FLEET PRISON.

"WITHOUT Ludgate," wrote John Stow in his incomparable "Survey of London," "on the right hand, or the north side from the said gate, lieth the Old Bayly, as I said, then the high street called Ludgate Hill down to Fleet Lane, in which standeth the Fleet, a prison house so called of the Fleet or water running by it, and sometime about it, but

"At the front," says this writer, "is a narrow court. At each end of the building there is a small projection or wing. There are four floors—they call them galleries—besides the cellar floor called 'Bartholomew's Fair.' Each gallery consists of a passage in the middle, of the whole length of the prison, 66 yards; and rooms on each side of about $14\frac{1}{2}$ feet by $12\frac{1}{2}$, and $9\frac{1}{2}$ feet high; a chimney and window in every room. The passages are narrow (not 7 feet wide) and darkish, having only a window at each end. On the first floor, the hall gallery, to which you ascend by eight steps, are a chapel, a tap-room, a coffee-room (made of two rooms for debtors), a room for the turnkey, another for the watchman, and eighteen rooms for prisoners. Besides the coffee-room and tap-room, two of these eighteen rooms and all the cellar floor, except a lock-up room to confine the disorderly and another for the turnkey, were held by the tapster, John Cartwright, who bought the remainder of the lease at public auction in 1775. The cellar floor is sixteen steps below the hall gallery. It consists of the two rooms just mentioned, the tapster's kitchen, his four large beer and wine cellars, and fifteen rooms for prisoners. These fifteen, and the two before mentioned on the hall gallery, the tapster lets to prisoners for



THE OLD FLEET PRISON.

now vaulted over." Stow's "Survey" is dated 1598, and, according to the honest old chronicler, the Fleet antedates Richard I. It has been proved to have been a debtors' prison as early as 1290. The most recent of the buildings forming the Fleet prison were finally demolished in 1846; its site is now occupied by a well-known memorial hall after "the Gothick manner." In the year 1780 the prison was burned down by the Gordon rioters, but immediately rebuilt on the old plan. The fine old print by Rowlandson and Pugin, dated 1808, which we reproduce to-day, shows the court and façade of the building as reconstructed. What the general arrangement of the place was we may gather from the writings of Howard, the philanthropist, who visited the Fleet, April 1774, and five years afterwards, in his "State of the Prisons of England and Wales," speaks of the Fleet as clean and free from offensive odours.

from 4s. to 8s. per week. On the second floor (that next above the hall gallery) are twenty-five rooms for prisoners; on the next gallery twenty-seven. One of these, fronting the staircase, is their committee-room. A room at one end is an infirmary; at the other end is a dirty billiard-table, kept by the prisoner who sleeps in that room. On the highest storey are twenty-seven bedrooms."

It would appear from this description of Howard that all the rooms above described were for "Master Side" debtors, the "Common Side" debtors occupying apartments in the right wing of building.

In Noorthouck's "New History of London," dated 1773, we find it stated that the Fleet was "very large and was reckoned the best prison in the City for accommodation; but the buildings within being old, part of them lately fell down."

In 1726, the farming of the prison having become intolerably corrupt, a Parliamentary inquiry took place, and Huggins, the hen farmer, and Bambridge, his lessee, were tried for murder. Definite reforms were brought about by the action of a body of benevolent gentlemen who, in 1729, formed themselves into a committee to search into the horrors of the gloomy prison.

Noorthouck, above referred to, says:—"All sorts of games and diversions are carried on in a large open area, enclosed with a high wall." In the print we thus see the prisoners engaged.

It was not, however, primarily to recall the old memories of the Fleet, whether relating to its history, its crimes, marriages, or worthies connected with the building—among whom Mr. Pickwick must not be forgotten—that the reproduction of the old drawing of Rowlandson and Pugin is put before the reader. The print has been lent by Mr. James Brooks, who points out that a drawing of a building made nearly a century ago shows what looks uncommonly like a ventilated soil-pipe running up the wall. If not a soil-pipe it is hard to say what the feature as drawn represents, and if a soil-pipe, and moreover a ventilated soil-pipe, it is certainly remarkable. Howard, we have seen, speaks of the Fleet as "clean and free from offensive odours." It must be something more than a coincidence that a building of this nature should be pronounced wholesome at the latter end of the eighteenth century, and that a drawing of the same or practically the same structure, made comparatively but a few years later and by a skilled architectural draughtsman, should show ventilation on so-called modern principles. No great amount of imagination is required to distinguish a wire "balloon" duly provided and fixed at the end of the pipe. Moreover, there is on the left of the façade, as shown in the drawing, what may reasonably be taken to represent a similar pipe, only one not so clearly shown, running over the parapet and up the chimney-stack.

We are forcibly reminded of the saying that "there is nothing new under the sun." Our modern sanitary engineers may claim the ventilated "S. P." as their own; but it is probable that—as in the case of the modern craze for sloping backs to fireplaces, the advantages of which were pointed out years ago by Count Rumford—it is the fruit of the labours of older men at times when thought was deeper if more slow, and when there was less hastening to the Patent Office.

R. OWEN ALLSOP.

ARCHITECTURAL ASSOCIATION SOIREE.

THE annual soirée of the Association was held on Thursday evening, the 16th inst., at the headquarters of the London Scottish Rifle Volunteers, James Street, Buckingham Gate.

There was a full attendance of members, the large hall being filled. For stage purposes the lights in the hall were not turned on, and the illumination from the stage did not afford a proper sight of those who formed the audience.

The first part of the evening's proceedings was devoted to a variety entertainment, excellently carried out by professional ladies and gentlemen who were present by kind permission of their respective managers.

Mr. George Robey won applause for his sketch in character, as also did Mr. F. Baring Ranalow for his song, and Miss Ray Maskell acquitted herself well in a dancing performance. Mr. John le Hay appeared quite a master in ventriloquism. Two lay figures were used representing Mr. Someone and his wife, both types of the irrepressible couples sometimes met with, with whom conversation is impossible for their interruptions. As a last resource they may be asked to sing a song, and then matters are not bettered, as husband and wife make known their entire depreciation of each other. When the curtain was raised the two headless lay figures were seated on the stage. The operator fixed the heads and dexterously manipulated them. The boisterous voice of Mr. Someone contrasted well with the squawky voice of his better half, but it was in vain to look for any sign that Mr. Le Hay threw his voice into them. Mr. A. Nelstone afforded much amusement with his antics in india-rubber shoes. Mr. R. B. Hopkins well sustained his part in hand-bell ringing. Mr. Fred Frampton was among the best with a recitation, and Mr. Dudley Causton well reminded the audience of the late Corney Grain's talent. Mr. Harry Tate gave some imitations, one of Mr. Robey. Others who contributed were Mr. Frederick Upton, Mr. Lovell Fry, Mr. A. Faber and Mr. C. Birkett.

The second part of the entertainment was the acting of a bulesque in one part, "King Arthur: an Examination of the

Past," composed by Mr. Arthur W. Earle and Mr. E. Howley Sim, and executed by members of the Association.

Characters.

The King ...
Sir Lancelot ...
Sir Mordred ...
Sir Percival ...
Merlin ...
It ...
Guinevere ...

Mummers.

J. Dixon Butler.
A. Harris.
H. Phillips Fletcher.
C. V. Cable.
R. Minton Taylor.
T. H. Lyon.
G. B. Carvill.

The songs during this part included parodies of the following songs:—Baby on the Shore, Brown of Colorado, Tin Geegee, Where was Moses when the Light went out, Golden Hair, Postillion of Love, Happy Darkies, Trinity Church, Houses in Between, Alabama Coon, Happy Home, It ain't all Lavender.

SCENE.—*Camelot, the Seat of the District Surveyor* (devised and executed by E. Graham Simpson, of the firm of W. B. Simpson & Sons, 99 St. Martin's Lane), the proscenium and stage being erected by D. C. Hancock & Co., West Ham Lane, Stratford, E.; dresses by May, of Bow Street; wigs by Hugo, of Chandos Street; and the pianofortes lent by Steinway & Sons.

During the evening the Bijou Orchestra played under the conductorship of Mr. Samuel Dodwell, and the entertainment committee were also indebted to Captain White, L.S.R.V., for much assistance.

The frontispiece of the programme was a capital adaptation, "The A. A. Knight, goes forth to fight," with apologies to Olympia, Limited.

With apologies to the authors we venture to give the following version, very shortly, of the amusing and well-acted play, as an indication only of the subject. Students of architecture have a keen perception of the fads of their elders, and the usual good-tempered skits were not absent; and as the present members grow aged and get their fads it may be supposed, they will enjoy being "taken off" in their turn.

The scene as above was Camelot—"Ye seat of ye District Surveyor."

The time—"Inquire at King William Street."

The King and the remnant of his Round Table companions have buried the swords "for fights," to see what they can do with "ancient lights." Some one calls; he has come for a plan. It is not quite ready. Lancelot inquires what is the thickness of a staircase string. Merlin, who made an excellent sage, and would be unapproachable as a clown, explains—and leaves the matter unexplained. There is a ring at the bell, and some consternation; but it was not the water-rate collector but Sir Percival, a new pupil just come in time, for the rent is due, and Sir Percival's pa has a large account at Coutts's. He comes "to sit at gracious feet, and learn the art of architecture sweet." He had sat at other feet, and accompanied those footsteps in divers journeys and excursions to foreign lands, to find his knowledge was even as it was before. Not the vulgar art of building will I teach thee, says the king, but the glorious traditions of art. See the buildings of Camelot—the institute of our late imperial kingdom. "Observe the beauty of the ornament, the expression of the lions before it, and the cunning hand which has applied the detail of a drawing-room cabinet to the greatest building of our city." Secondly—No; it is not a Dutch warehouse. Thirdly—Something wanting? Yes, erected in summer, there is no frieze. And the warriors grasping each other's palms? Only the architect shaking hands with the sculptor. The museum of antiquities? It is not yet up. It will be when Lord Hatfield next rules the Assembly. Next building not yet up either. Plans got out, and it went best with the buildings over the way—the new premises of the world-famed A. A.

The king is reminded that his annual exam. is on that day; therefore he must away, but first he must know how to answer questions. What was Wren architect of? Lancelot thinks he was architect of all the fire insurance offices. Mordred explains the meaning of an entasis as "a sort of swelling cultivated by the Greeks." How many columns in Gloucester Cathedral? The sage, Merlin, replies as many on the south as there are on the north. How is terra-cotta made? Lancelot says ask Sir Leonard Aloysius. What are the duties of an architect? Mordred: To do all the work and get nothing for his pains. A two-horse chariot, with conductor at the back, crying, "City, City, the Bank," is then secured for the king.

In the absence of the king, Lancelot, field-marshal and past master in smoking concerts, says, "I boss this show. By right, gentlemen of the artists." When Lady Guinevere appears Mordred is distracted from his "provide and fix," and Lancelot from his half-inch detail of a syphon trap. Says Lancelot, "All who fail to pass the F.R.I.B.A. exam. must be stripped of yellow jacket and peacock's feather." Guinevere, however, proposes to Lancelot. Lottie, he says, she must call him; and he accepts conditionally on having permission to pack a carpet bag. Guinevere helps him in a light and air case by a prompt suggestion to tip up the horizon.

Guinevere is enraptured with Lancelot's talents—believes he could carry off the Soane Medallion in a bad year, and his taste in perspective is nearly good enough to take in washing when times were bad, and if not able to pass the R.I.B.A. exam., at all events the intermediate. And then he had won the competition at Weston-super-Mare, in spite of the referee being his first cousin; but he had not sat at tables of dukes and shot the pheasants of American millionaires for nothing. "Noble of thee to work for 3 per cent., and no travelling exes."

Pleasant for Sir Lancelot, and quite the reverse for Mordred, who in regard of Guinevere felt himself "spoofed." Merlin, the sage, consoles him thus:—

Oh, fates that rule around, provide and fix
That ne'er again for him shall mortar mix;
That all his best stock bricks shall turn to shuffs,
Whene'er he uses reds they turn to buffs.
May all his full-size details go astray,
And terra-cotta turn to unburnt clay;
And iron girders and all R. I. J.'s his
Belgium become and go to blazes.
Let him be thrown from a height at least three feet,
Be well rammed down and cemented neat;
And all that shall be left of this false knight
Be six inches of good cement o'er the site.

The king returns, and a letter of instructions for a competition comes in by post. The struggles to get the drawings out by division of labour are amusing, and for drawings so got out no motto could have been more appropriate than "Design in haste, repent at leisure." They had "bits" of all the best work in the kingdom in them, as gained from the professional journals.

As a result of his examination a despatch is sent to King Arthur that he is doomed to execution, not, as he imagined, for forgetting to provide accommodation in the lunatic asylum for the examiners, but for failing in knowledge, failing to give at a moment's notice all information in Gwilt, together with entire ignorance of the clauses of the London Buildings Act. But Guinevere comes to the rescue. "I will save thee. Knowest thou not that no man may wield the executioner's sword unless he can say of his own knowledge what is the use of examination?" Then Lancelot, after finding his intended has sufficient to pay the bus ticket, goes off with her, to be more or less happy for ever after.

The humorous skits were mainly to be sought for in the songs. One of the officials of the County Council was present rather conspicuously till some of the songs had been given. The professional press got off well, except in one case, where a little gentle satire was administered. A call was made for the authors, who on their appearance were well acclaimed. About 25 minutes to 12 the National Anthem struck up, and the company dispersed to catch trains, if they could, to take them home. It is to be hoped the member *en route* for Waterloo Station caught his train. "Oh, yes, you will just have time to catch it," were the last words your reporter heard on leaving the L.S.R.V. Hall.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute of Architects was held on Monday evening, Mr. F. C. Penrose, president, in the chair.

The President excused a slight delay in opening the proceedings by saying they had received a deputation of architects from Westphalia, who had presented the Institute with two valuable books.

The decease of Mr. Piers St. Aubyn, elected a Fellow in 1856, was announced.

Anglo-Saxon Architecture.

Professor G. BALDWIN BROWN read a particularly interesting paper on the above style. He wished that the Institute could see their way to deal with this historic subject, the details of which were mostly hidden away in obscure localities, and were only known to local archæologists. It appeared from Professor Brown's remarks that Anglo-Saxon architecture never existed as a style. He cited numberless instances of churches of Saxon origin—pre-Conquest buildings he called them—that were neither distinctly Roman or Norman. At the close of the eleventh century it was more easy to distinguish between the works than those of the earlier decades. Saxon buildings, however, possessed individuality and distinctive features. They showed a noble rudeness exercised by the primitive architects. Contrary to Norman usage, large stones were employed, endowing the buildings with a megalithic appearance. The ornament was bizarre, rude and massive, and the elaboration mostly childish in enrichments and details.

The Saxon churches were distinguished by the clumsy and peculiar forms in the application of Roman or other motives. These he traced as originating from Roman and Celtic styles. The numerous buildings and monuments he cited so amply, it

would seem, corroborated his views. He alluded to a want in architectural literature. Even Rickman had concerned himself rather with details of buildings than reference to buildings as architectural in their finished state. The Saxons had mainly expressed Roman or Celtic details in their own forms. He strongly urged that the Institute should focus the labours of so many workers all over the country, by bringing together their varied information.

The PRESIDENT said he could not then say whether the Institute could do more than seek for information through the allied Societies.

Mr. RICKMAN proposed a vote of thanks to Professor Brown for his paper. He alluded to his father as an accountant; therefore his father had been inclined mostly to details and minutiae.

Mr. WILLIAM WHITE, F.S.A., seconded the vote of thanks, and then took Durham Cathedral as a subject for his speech.

Mr. R. PHENÉ SPIERS supported the vote, which was carried by acclamation.

THE COCKBURN ASSOCIATION.

THE report by the Council of the Cockburn Association, Edinburgh, expresses regret at the death of Lord Moncreiff, who was among the founders of the Association, and up to the last took a warm interest in its affairs. During the past year fewer subjects than usual were presented for the consideration of the Council, and this circumstance afforded an opportunity for giving some attention to measures for extending the activity of the Association. With this object two sub-committees were appointed, in the one case to consider the whole question of the Dean Valley from the Dean Bridge upwards to Coltbridge, with a view to its being opened up to the public, and in the other case to watch all alterations, actual or projected, in connection with the city improvements in the Old Town. A variety of subjects engaged the attention of the Council, including their suggestion that the railed-in ground to the east of the national monument on the Calton Hill should be opened to the public; unsightly advertisements and advertising hoardings; the opening of Holyrood Palace gardens to the public; the reported proposal to carry a tramway route along the Middle Meadow Walk, of which the Council disapprove; the erection of new seats at Rest and be Thankful; the condition of the buildings towards the west end of the Castle Rock; the apprehended danger of the view of the city from the locality of the Northern Park being injured by the erection of a row of houses on the south of the Arboretum, and the improvement effected by the removal of the old buildings on the west side of Bristo Street. In the paragraph dealing with the Castle the Council say:—"They beg once more to express their profound dissatisfaction with the condition in which the barracks and other buildings towards the west end of the rock have been allowed to remain. These buildings have been the subject of constant complaint for many years, and it is understood that funds specially appropriated to the Castle actually exist, and are applied to other purposes. Whether this is so or not, the present state of the Castle is a disgrace to the authorities."

Lord Kingsburgh, the Lord Justice-Clerk, in moving the adoption of the report at the annual meeting, said it referred to a number of subjects, and gave hope that some good was being effected. He was very glad to see that the North British Railway Company were inclined to accept a remonstrance against the placing of large advertisements upon the Waverley Bridge facing East Princes Street Gardens. Whether they should be able to effect anything or not they did not know, but in the meantime they had the Company's profession of goodwill, which was always something to work upon. Another important subject was that of the signal cabin in East Princes Street Gardens. All of them had felt that after the report made by the official inspector of the Board of Trade it was not possible to oppose any further the erection of a signal-box in the middle of the space occupied by the railway company; and his own opinion was that a cabin erected in the middle of the railway lines would not shut out any of the view of the gardens, whereas if erected in a recess it would have obstructed the view very considerably. The beautifying of the Castle, and the removal of discreditable buildings there, was making progress. He knew from communications he had had personally with the General commanding the Scottish district that there was a great anxiety on the part of those really interested in the matter connected with the War Office to have an improvement made there; but he thought it very advisable that the Association and the citizens should use as much pressure as they could to have it speedily done. Concerning the Northern Park and the Arboretum, he thought it would be a great improvement if the roadway which ran between the two were taken into the public ground of the city and used as an avenue. The formation of a walk for the citizens along the Water of

Leith from Coltbridge down to St. Bernard's Well would be a great thing to achieve, and he thought there was every prospect of its being accomplished. In conclusion, his lordship urged the desirableness of increasing the membership, with a view to increasing the influence of the Association. The Earl of Stair seconded the adoption of the report. Sheriff Vary Campbell quoted a denunciation of the Castle buildings by Lord Cockburn made as far back as 1849. Since then the authorities had done nothing, and it was only use and wont which enabled the people to bear with the hideous erections on the Castle Rock. The report was adopted.

TESSERÆ.

Coloured Limestones.

IN most countries there are found immense beds of limestone of various geological ages, some from below the coal that is older than it, and others newer than it. The former are usually very hard, compact, and sometimes nearly as crystalline as primitive limestone; they break generally with a peculiar smooth surface, and, from the resemblance of the broken surface to some forms of shells, are said to have a conchoidal or shelly fracture. This peculiar hardness and evenness of texture render them capable of assuming a high polish, and many of them are consequently employed as marble. These rocks are usually coloured, sometimes uniformly as the black ones, but more usually unequally, so as to produce a variegated effect, which is often very beautiful. The colouring matter of the various shades of black and grey is charcoal, derived from the remains of animals, and probably also of vegetables. White is the natural colour of carbonate of lime, while the various shades of red, yellow, purple, &c., are principally produced by compounds of iron. It must not be inferred from what is here stated that it is only the old limestones which are sufficiently hard to serve as marbles. Many varieties of marble have also been obtained from beds of the same age as Portland stone; they are not, however, so general, and there is a much less variety of colour among such marbles than among those derived from beds of the age of our limestone rocks. They are usually of a greyish tint, and are occasionally sprinkled with rounded dots, which look like the roe or eggs of a fish, hence the name oolitic is sometimes applied to such marbles. Other shades also occasionally occur. Even the most recent deposits of carbonate of lime may have the characters of marble, the most essential of which is being crystalline, as is shown by the marble-like casts of medallions, &c, which are at present manufactured at the baths of San Fillippo in Tuscany. Here a number of warm springs issue, so loaded with carbonate of lime held in solution by carbonic acid, and with gypsum, that the water has been known to deposit a solid mass of rock 30 feet thick in twenty years; this water is conveyed by a pipe to the top of a chamber, whence it is allowed to fall as a kind of dense rain from a height of about 12 feet to 14 feet, a number of twigs being interposed to break its fall and scatter it about in spray, which, falling upon the moulds that are intended to be copied, and which are previously washed with a little solution of soap, coats them with a marble-like deposit. In a country where such deposits are even now forming, one may expect to find a great variety of marbles of various ages, and accordingly Italy has been celebrated for its coloured marbles from the remotest antiquity, and even still supplies Europe with a large part of the marbles employed in decoration.

The Organ.

The origin of the organ is hidden in obscurity, and all we can learn is that it seems to have been borrowed from the Greeks, as Vitruvius describes one. He attributes the invention to Archimedes (two hundred years before Christ); and Ctesibus improved upon it by the use of water and of keys. The ancients employed the fall of water, pumps and different kinds of bellows to cause the motion by which the wind was introduced, and at last stopped at the wind bellows, which was set in motion either by water or human strength. Hence arose two kinds of organs: that moved by water was called hydraulic, and that by wind pneumatic. However, there was no difference in the principle, as it is only by air the pipes can produce a sound. Although the earliest descriptions appear to belong to the hydraulic, it seems natural to suppose the pneumatic one to have been first invented. An engraving given in Sir John Hawkins's "History of Music," from a monument in Rome, seems to confirm the latter opinion. That mentioned by Vitruvius was an hydraulicon. Du Cange quotes an epigram descriptive of an organ said to have been in the possession of Julian the Apostate in the fourth century, and concludes that it was not an hydraulic instrument, but resembled much the modern pneumatic organ. St. Jerome mentions one with twelve pairs of bellows and fifteen pipes to each key, which might be heard at the distance of a mile; and

another at Jerusalem which was heard at the Mount of Olives. Pope Vitalian is generally allowed to have been the first who introduced the organ into the service of the Catholic Church, about the year 670. Dr. Burney says that ancient annalists are unanimous in stating that the first organ seen in France was sent from Constantinople as a present to King Pepin, father of Charlemagne, by Constantine, in 757. This, as well as Julian's epigram, gives the invention to Greece. It is curious that the Venerable Bede, who died in 735, notwithstanding his minute description of the manner in which the psalms and hymns were sung in the churches, says nothing of the organ. However, according to Muratori and Mabillon, organs became common in Italy, Germany and England during the tenth century, about which time they were admitted into the convents throughout Europe. The poet Mason, in his "Essays on Church Music," gives several historical notices concerning the origin and progress of the organ previous to its general admission into churches. These early attempts were very rude in construction; the keys were 4 or 5 and sometimes 6 inches broad, the pipes were of brass, and the compass did not exceed two octaves in the twelfth century, about which time half-notes appear to have been introduced at Venice. A description of one procured by Elfeg, Bishop of Winchester, for his cathedral in 951, states that it was the largest then known, having twenty-six pairs of bellows, requiring seventy men to fill them with wind. It had ten keys, with forty pipes to each key. There was also one at Canterbury Cathedral previous to the year 1174. At Venice, about the year 1471, the important addition of pedals was made by a German named Bernhard, to whose countrymen we also owe most of the other improvements. The organs built by Schmidt for St. Paul's, the Temple, St. Mary's, Oxford, Trinity College, Cambridge, &c., were commonly confined to four octaves from CC in the bass to C in alt. They are very superior in tone to the generality of modern instruments, so much so that they have had their compass extended and many other improvements added during the last century by Byfield, Snetzler, Green, Gray and others. The earliest organ-builder in England was William Wotton, of Oxford, who built in 1482 an organ for Merton College; also one for the chapel of Magdalen College. The old organ at York (since burnt) was one of those that escaped the destruction of those instruments during the civil wars, although Cromwell himself was so fond of the organ that he caused the one at Magdalen Court, Oxford, to be removed to Hampton Court. It was afterwards restored to the College, where it remained till 1740, when it was removed to Tewkesbury. In 1660 there were only four organ-builders in England.

John Glover and Birds.

One of the founders of the Water-Colour Society was John Glover, and in 1815 he was elected president. Three years afterwards he retired from the Society, in order to become a candidate for an associateship in the Royal Academy. He was not, however, successful. In 1824 he helped to found the Society of British Artists. At one time Glover proposed retiring to the North of England, but instead, he emigrated to the Swan River Settlement, and he was consequently the pioneer of art in Australia. He died in Launceston, Tasmania, in 1849, in his eighty-second year. Glover devoted himself to landscape, but he carried perhaps his knowledge of birds beyond that of any man who ever lived. It was his custom in the summer season to visit the most romantic parts of England and Wales, and there to pitch his tent and draw and colour from nature. He chose for his retirement the vicinity of some unfrequented village, and being very abstemious in his diet, contented himself with the humble fare that the nearest ale-house afforded. His sole companions in these excursions were birds, with whom he held colloquy, professing perfectly to understand their language and to have made them conversant with his own. Pigeons were his favourites, as being most intelligent. Of the latter species he had one who would sit on his shoulder while he was at work, and who, when evening came, was wont, at a given signal, to fly home and await his master's return. One day the artist made a circuitous route, and being interested with sketching some newly-discovered scene, or catching some extraordinary effect of light, forgot the hour, when he was surprised at seeing the little creature soaring above his head, and at length alighting on his accustomed perch. When seated there, it expressed, by the querulous tones of its voice and the sharpness of its beak, its displeasure, which Glover was for a while puzzled to divine the occasion of. He soon, however, threw him up in the air, and pointed towards the encampment; but his attached friend resumed his old post, and would not be driven away, nor would ever afterwards be induced to lose sight of him, being afraid, as the painter said, that it was his intention to give him the slip. Starlings, he used to say, were possessed of great genius, and being asked which of the feathered tribes were the least so, after a pause he replied sparrows—not that they wanted talent, but that they were vulgar fellows. He had made the habits of birds so much his study that when a lark

was hovering over a field he could tell whether the songster had eggs, a callow brood, or if the young were full-fledged; in fact, Jean Jacques was a mere ignoramus compared with him. It is a pity he did not leave us, before he went to the New World, a complete grammar and dictionary of the particular language of each species, and an exact prosody for rightly comprehending the intonation of the words. Thus perhaps he was convinced that nightingales or thrushes (the finest songsters, by-the-by, of the two) do not sing for the pleasure of singing, but of conversing with one another and conjugating the verb "love."

Varieties of Slate.

Slate is the generic term applied to all fine-grained argillaceous or clayey rocks breaking into thin laminae. When the laminated character is but imperfectly developed the term "shale" is used; when it is so perfect that the rock readily splits into thin even plates it is called "roofing-slate." The colour of slate rocks is as various as the degree of lamination; the chief colours are, however, gray, greenish gray, green, purplish and dark blue. Roofing-slate is almost always of the latter colour. Slate rocks insensibly pass into grits according as the argillaceous constituent diminishes and that of sand increases, the property of laminability diminishing in the same degree. The finer and more argillaceous the slate, therefore, the better adapted it is for yielding roofing-slate. When slate rocks are in contact with large masses of igneous rocks, especially with granite, they undergo a remarkable change, being, as it were, baked into what is called mica slate, which sometimes passes almost completely into mica, one of the constituents of granite. Where the rock thus altered had been originally a fine-grained slate, and the baking not proceeded very far, it may still be used for roofing slate, being more durable than the unaltered rock, although the slates are not so even. Good roofing-slate should be of a uniform fine grain, should split easily into even plates, which may be easily pierced with holes by a sudden blow of a sharp-pointed instrument without being fractured; its colour should not be very dark, as that indicates a large quantity of carbonaceous matter, the presence of which assists in the decomposition of the slate; it should also be free from pyrites, and, finally, it should not absorb much water either by its surface or edges, a point which is readily ascertained by weighing a piece of the dry slate, plunging it in water, and then weighing it again after the surface had partially dried. Although the less perfectly laminated slate-rocks are sometimes used as a building material they are not well adapted for that purpose. The finer kinds of roofing-slate, when large-sized slabs can be obtained, are adapted for many useful purposes besides the roofing of buildings, such as the construction of cisterns, acid condensers, billiard tables, benches for laboratories, baths, &c.

Farm Buildings.

Under improved farm management there are two departments of business, each requiring special and particular attention—the one consists in the tillage and improvement of the soil so as to make it yield the largest amount of produce, and the other of the economical conversion of a large proportion of that produce into meat for the butcher and into milk, butter and other articles. It is obvious that it is equally important to attend to the latter as to the former consideration. Good tillage will not avail unless the necessary arrangements are made for the disposal of the produce, and this can only be done by suitable buildings to admit of these arrangements being economically carried out. The first consideration in buildings of any class is fitness for the intended purpose. To secure this it is obvious that a knowledge of the desired requirements must precede any successful effort to realise them. And not only should the plan of any intended farm-stead be adapted to the most improved system of management, but it should be specially designed for the farm, and even for the situation, in which it is to be placed. Some special knowledge of the details of agricultural practice is evidently required to attain this end—a kind of knowledge in which the ordinary architect is deficient. The most fantastic and unmeaning buildings are often produced, exhibiting an utter ignorance of the purposes for which they were required, and to attain some fancied symmetry every other consideration has been made subservient. On buildings of any pretension the outlay in most cases has been ridiculously extravagant. When the interest on this sum becomes a tax on the farmer's profits, any unnecessary expenditure becomes wholly unjustifiable, and every such case, instead of providing a model to follow, only serves as a beacon to others to guard against falling into similar mistakes. Suitable farm buildings have now become a necessity of improved husbandry, without which it cannot be carried on. Hence the great importance of correct notions on the subject gaining ground in a country whose industry mainly consists in the tillage of her soil. The agricultural architect should be aware of the conditions under which the objects of the farmer can best be attained. He has to consider, for

example, under what sort of treatment animals most readily take on flesh, for without such knowledge how can he provide the requirements? The proximity of certain classes of buildings is to be secured, the reason of which will be obvious. It is not, therefore, to be wondered that, in the effort to attain such objects on the part of the ordinary architect, sad blunders have been committed.

Varnishes.

Any liquid which, when spread over a substance, leaves on evaporation a thin coating of a solid hard substance, having a sort of vitreous lustre, as if the surface was composed of glass, may be considered as a varnish. Varnishes must, consequently, consist of two distinct classes of substances—liquids which readily evaporate when exposed to the air; and solids, which are capable of being dissolved in those liquids, and which remain behind as a hard, vitreous-like coating. The solid substances employed in the manufacture of varnishes are all of vegetable origin, and belong to that class of substances which, like tannin, are principally found in the bark of trees. These are usually considered under three heads—gums, resins and gum-resins. Gums are exudations from the bark of trees, which dissolve, or at least soften, in water, so as to form mucilages, but are insoluble in spirits of wine. Resins are similar exudations, which are capable of being melted by heat, dissolve in spirit of wine, but not in water; and gum-resins are substances of like origin, containing, as the name imports, mixtures of gums and resins. Although, properly speaking, a solution of gum in water, such as is used to stiffen and give lustre to silk and other textile fabrics, must be considered, according to our general definition, as a varnish, that word in commerce is confined to solutions of the true resins. But as these substances are not soluble in water, that liquid cannot form an ingredient of ordinary varnishes—the liquids which are usually employed being spirit of wine or analogous fluids, essential oils, and drying fixed oils. These latter do not fulfil one of the conditions which are laid down as constituting a varnish, namely, that the liquid should evaporate readily; but, in fact, drying oils are themselves varnishes, inasmuch as they become resins from the action of the air. Every resin is not equally well adapted for making varnishes; some will never harden perfectly; others, again, have peculiar colouring matters in them which limit their applications; hence it is very rare to find a varnish composed of only one resin, the usual custom being to mix several so as to obtain a compound having properties suited to the object for which the varnish is intended.

Sculpture and Painting.

A statue may be compared to a star, and a painting to a flower. The one is apart, unchanging, independent and sublime—it is full of a light that burns only for itself; it derives no apparent nourishment from any outward source; and it lifts our thoughts to hold communion with higher races than man. The other, belonging to our earth, and the child of it, is a portion of that nature to which we ourselves belong, is fed by the atmosphere we breathe and clad in colours which attract us the more because we irresistibly connect with them the notion of decay. The statue might be fancied the marble chrysalis of a spirit that will soon take wing to its planet. The painting is the exquisite and blooming bud that grows from the native soil of man.

The Etruscan Veii.

The ponderous masses of 10 and 11 feet in length, and some of more than 5 feet in height, are sufficient to evince the venerable antiquity of these remains. The position of some of the blocks shows that the propriety of uniting two upper stones above the centre of a lower block was not known, and denotes the construction of a remote period. One of the most singular facts attending this wall is a bed of three courses of bricks, each 3 feet in length, intervening between the lower course of the wall and the rock upon which it is built. That the Etrurians, and in particular the Veientes, were celebrated for skill in works of terra-cotta, is acknowledged. The quadriga for the central acroterion of the Temple of Jupiter (which was the object of dispute between the cities of Veii and Rome, and which, on account of the prodigy of the victorious charioteer at the Porta Ratumena, whose horses are said to have run from the racecourse to Rome without stopping (Plut. in "Vit. Publicol." chap. 13), was finally transmitted to the latter city), is among the noted instances of the superiority of Veii in works of terra-cotta; but it would be difficult to say what could have been the motive of employing brickwork in walls of so massive a construction as those of Veii. In other parts, owing to the bushes and an accumulation of earth, the foundations of the walls cannot be examined without excavation. It requires only a very moderate knowledge of the subject to convince us that the construction of the wall of Veii has no resemblance to anything remaining at Rome, nor yet at Nepi, Falerii or Tarquinii, where the ramparts were in smaller blocks and nearly regular. The style of the fortifications of Veii bespeaks a still higher antiquity.

NOTES AND COMMENTS

ALTHOUGH there may be an interregnum between the assumption of power of local authorities, ratepayers are not likely to benefit by it. Sooner or later all liabilities must be met. Some inhabitants of Barry, in Glamorganshire, have received a lesson to that effect. Up to 1888 the district was under the control of the Cardiff Union as the rural sanitary authority. Two years previously two streets were formed, and plans for houses in them were approved and carried out. The streets were not, however, formally taken over. In 1888 the Barry and Cadoxton Local Board was formed. As usually happens with new authorities, there was a high standard of work set up, with which the streets did not correspond. The owners were ordered to repave the streets, and as they refused, the work was executed by the Local Board, and proceedings were taken for the recovery of the amount. The county court judge decided against the Local Board, and consequently an appeal was brought and heard in the Queen's Bench Division. The Lord Chief Justice declared that the county court judge was in error in respect of the claim for channelling, kerbing, &c., and, with the concurrence of Mr. Justice CHARLES, the case was remitted to be dealt with eventually by an apportionment of the amount to be paid by the owners. It is evident that the owners of the houses in the streets have some reason to be discontented. They performed all they were bound to in order to satisfy the original rural authority. It may be assumed the paving was up to the standard adopted at the time. The owners could not be expected to anticipate a time when superior paving would be necessary. In such cases, notice of the proposed change of authority should be given, and if the making of new streets cannot be delayed, the character of the work that will become necessary should be announced.

THE Ordnance Survey has diminished the amount of work which fell to land surveyors, and in consequence they cannot be expected to take as much interest in the operations as their predecessors. When we read in the treatise upon surveying called "The Practical Surveyor," by Mr. THOMAS HOLLOWAY (H. COX), the statement "that the maps of the present day are far inferior in finish to those made forty or fifty years ago cannot be doubted; formerly young men practised penmanship till they produced satisfactory results; now they look upon such practice as a waste of time, and are satisfied with mere scrawls in lieu of penmanship, and rude indications in lieu of trees and other matters of ornament," we see one of the consequences of superseding the ordinary surveyor. His plans of estates often deserved to be considered works of art, and a possessor had a right to be proud of such a representation of his property. It is surprising that in this age of exhibitions somebody does not make a show out of specimens. There are, however, cases arising in which the Ordnance plans are of little use, and then the surveyor has to be called in. His occupation, therefore, is not entirely gone in this country, although by itself hardly enough to make millionaires out of practitioners. For those who wish to pursue surveying practice, which has many attractions, Mr. THOMAS HOLLOWAY'S instructions will be serviceable. They have the manner of the old school of men who believed GUNTER'S chain was the best of all auxiliaries. Surveyors were taught in the field, and they considered that was the best course for their successors to follow. It is characteristic of Mr. HOLLOWAY as a representative of them to say at the close of his book, "Although the pupil may have gathered a fair theoretical knowledge of land surveying from a careful perusal of the foregoing pages, he must distinctly understand that he has not gained an atom of practical knowledge." Few modern writers would venture to write in that strain, but it corresponds with the surveyor's mode of thinking—his geometry represents the eternal verities. It must not be imagined that Mr. HOLLOWAY'S book is not practical; in that respect his instructions are superior to what are found in many books on the subject. He begins with suggestions about outfit, and offers hints about field work and office work which are derived from experience. Every surveyor has his "dodges," and the author's triangulation and office procedure may not

be approved by all, but his method, if rightly followed, will lead to accurate plans and correct areas. What more can be required?

A MAN who was seven times Mayor of Bath could hardly fail to be a potentate in the city, and it might be said of Sir JEROM MURCH, who died on the 13th inst., that he was omnipotent. The works of building and engineering undertaken by the Council were inspired by him. Two years after he was elected a member of that body he proposed a resolution that "a handsome and commodious range of buildings, comprising baths with suites of living rooms," should be erected on the site of the old White Hart. Thirty years ago a hotel was not considered as adapted for municipal enterprise, but it was erected at a cost of 300,000*l.* and handed over to a company. On the baths the expenditure was about 12,000*l.* Next he endeavoured to improve the Avon and to obtain a larger supply of water. In 1891 he moved for the appointment of a committee to consider the accommodation in the Municipal Buildings, and two years afterwards the memorial-stone was laid. His energy was seen in many other public works. Sir JEROM MURCH could hardly have been so successful without confidence in his own infallibility. It was, therefore, risky to oppose his progress. In 1878, for instance, Major DAVIS discovered traces of the old Roman baths and invited Alderman MURCH to accompany him. What followed is thus described in the *Bath Argus*:—"The Society of Antiquaries was communicated with; Mr. MURCH set to work to solicit subscriptions, and at the cost of 1,000*l.* the remains were uncovered. Since then Sir JEROM had seriously disapproved of the policy of his companion in that subterranean tour. He was grieved, deeply grieved, at the new baths being built over a portion of the remains, and when there was a possibility of Major DAVIS being the architect of the Pump Room Annexe, a letter from Sir JEROM MURCH, who was kept from the Council by illness, protesting against it under the circumstances, started that prolonged and bitter contest which ended in the adoption of another architect." In other words, Major DAVIS was made to suffer because he carried out the instructions of the majority of the Council, which were not approved by the Alderman. A man of great energy and tenacity can be useful, but the possession of one of those worthies in a public body is not without its drawbacks for architects and engineers.

ONE of the pictures in the Louvre which is generally sought out by English visitors is the *Shipwreck of Don Juan*, by EUGÈNE DELACROIX. The great painter differed from his contemporaries in the arts by his admiration of English literature. He was supposed to have paid a tribute to the power of Lord BYRON by the painting of the picture. The English poet, however, was not thought about when the work was undertaken. It was suggested by a paragraph which appeared in the newspapers at the time about a party of sailors belonging to a wrecked vessel called the *Don Juan*, who were luckily rescued from one of the boats when they had drawn lots for a victim who was to be devoured. The grim scene inspired DELACROIX. Afterwards it was discovered that in BYRON'S poem there was reference to a similar experience, and accordingly in the catalogue of the Salon of 1845 the words "Lord BYRON, 'Don Juan,' chapitre ii," were introduced after the title of the picture. In that way he was able to present an incident which had startled Frenchmen, and to impart elevation to it by the prestige of BYRON'S name.

THE Austrian archæologist, Professor OTTO BENNDORF, has come to the conclusion that the remains of antiquity in Ephesus were not exhausted during Mr. WOOD'S explorations, although they occupied about ten years. He has, therefore, resolved to make further trials on the ground, and as a sufficient sum of money is at his disposal to pay for systematic work, it may be assumed that some more surprises will be forthcoming. The sculptured columns now in the British Museum were a revelation, and the famous temple may yield other novelties which will testify to the originality of DEMETRIOS and PÆONIOS.



A GALLI
From the Painting

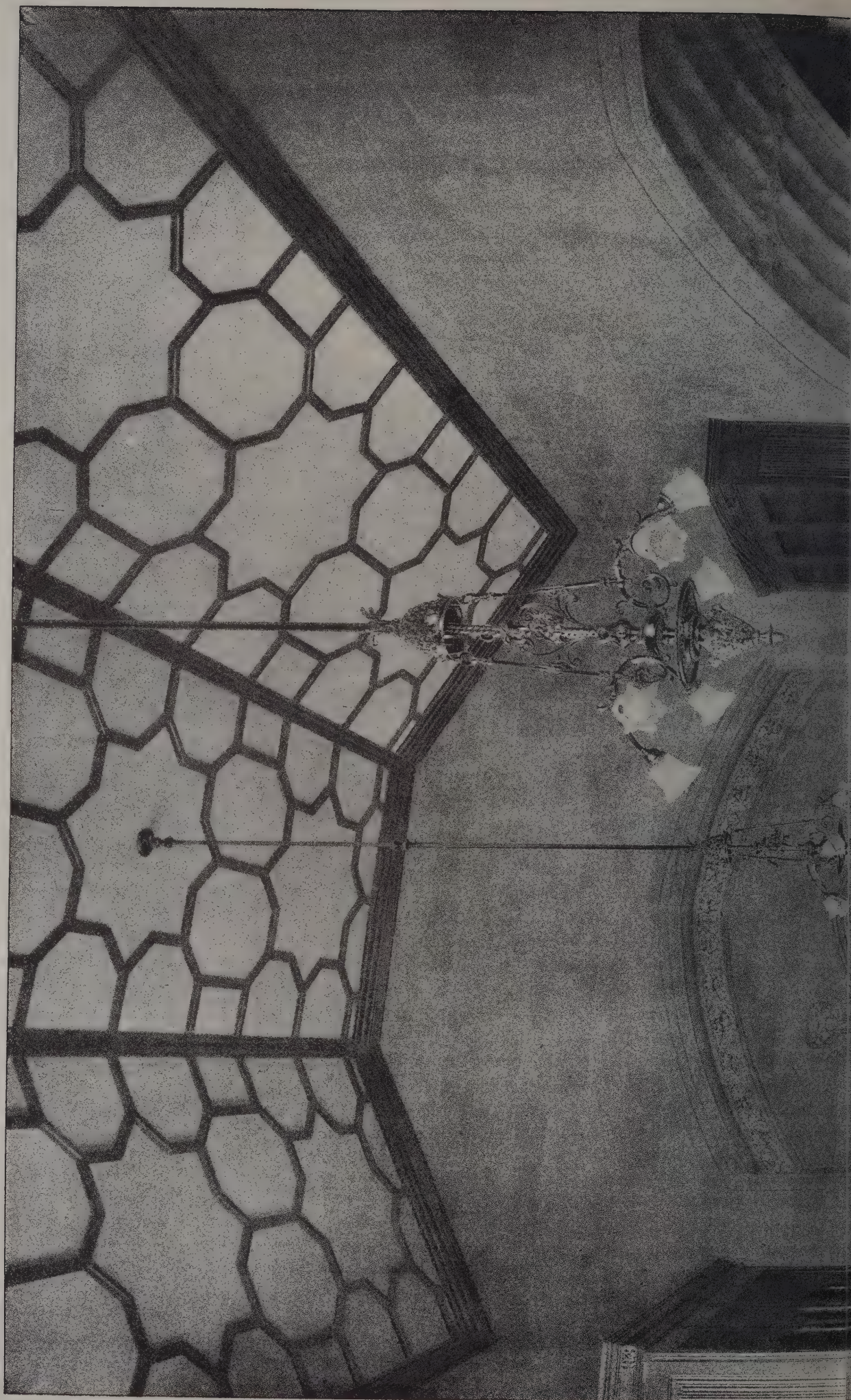


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The Architect, May 24th 1895.





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Messrs. PALEY & AUSTIN, Architects.

ILLUSTRATIONS.

NEW HIGH SCHOOL FOR GIRLS, DUNDEE.

THIS building, which cost about 14,000*l.*, is arranged to accommodate 900 girls. The architects are Mr. ALEXANDER McCULLOCH, C.E., and Mr. J. GRAHAM FAIRLEY, F.R.I.B.A.

A GALLIC TRIUMPH.

PAINTINGS relating to the continuous wars in France are apparently the most desirable for the public collections. M. CORMON has represented in the work we illustrate the return of the Gauls from one of those victories in which Roman discipline succumbed to the fierce attacks of the native tribes, and, as we see, some of the victors have carried off the spoils of the conquered.

LIBRARY, THURLAND CASTLE, KIRKBY LONSDALE.

SUSSEX CHURCHES.

A MEETING of the Society of Architects was held on Tuesday, the 21st inst., Mr. E. Hamilton, president, in the chair.

The Very Rev. Fred. W. Farrar, Dean Designate of Canterbury, was elected hon. member of the Society. The following were elected members of the Society:—E. C. Arnold, 55 New Broad Street, E.C.; C. E. Compton, Newport, Mon.; R. C. James, Clifton; Telfer Smith, Bult Wells.

Mr. H. GOODALL QUARTERMAIN read the following paper, entitled

Some Sussex Churches.

A run down to Brighton for business with a client is an ordinary occurrence in the daily life of many architects. With the exception perhaps for the change, or for the fresh air to be had, one is at a loss to find other reasons why so many are content to go again and again to a place which possesses so little architectural interest or beauty. There is only one building in Brighton which may be considered ancient, and that is the moderate-sized church which served the former inhabitants of Brighthelmstone. The town, so often described as a suburb of London, contains such shops and hotels as are to be found in a suburban west end. The modern buildings which justly claim an architectural merit are but few in number. Brighton is, as all such places are to the architect, a spot without a history.

But a few miles to the west, along the same coast line, will be found the ancient town of New Shoreham.

Shoreham graced with the grace of years,
Shoreham clad with the sunset glad, and grave with the glory that
death revere.—*Swinburne*.

I venture to think you will agree with me that here is to be found one of the most interesting though mutilated churches on the south coast. There is no church between Winchelsea and Chichester Cathedral at all to be compared in size, dignity and grandeur with this of New Shoreham.

Old Shoreham, at the mouth of the river Adur, originally a place of great importance, and probably one of the chief ports in the kingdom, was the mother church of New Shoreham. It is mentioned in Domesday Book as "Soreham," and "here is a church." Standing awhile on the South Downs just above the town, it is not difficult to imagine the cause of its importance or subsequent decay. You see the broad extent, and trace in the flat low-lying lands of "Shoreham Gap" the course, depth and moulding power of a tidal river; whilst you note the evident drift of sea-beach and sand-banks, which, as history tells us, has barred the harbour, and caused the river to seek an outlet into the sea a good mile and a half further east. The whole of this district in which the Shorehams are situate is known as the Rape of Bramber. It comprises no less than thirty-eight manors, together with the Castle of Bramber, now in ruins, and was conferred by William the Conqueror upon his Norman neighbour, William de Braose, the Castle of Bramber becoming the fixed residence of this fortunate nobleman. It is to this man and his successors that we are indebted for the first enlargement of the Saxon church of Old Shoreham mentioned in Domesday, part of which I am inclined to believe still stands, and also for the first foundation of the chapel of ease built nearer the coast, which preceded the church now known as St. Mary's, New Shoreham.

Shoreham, once able to furnish Edward III. with more ships than London, is now without harbour, trade or commerce, or even a beach which can easily be got at. It is, however,

not my intention to trouble you with too many particulars of the town, or occupy the time you so kindly place at my disposal in relating the history of the family which is now represented by the Duke of Norfolk (such information can be obtained by a study of Cartwright's and Horsfield's works on Sussex), but to endeavour to point out that enshrined within its area stands the church of St. Mary de Haura* (of the port), New Shoreham, a glorious architectural fragment, which is of only a little later date than St. Bartholomew's (1123), Smithfield, or Waltham Abbey, Herts. I mention these examples because they are near and because there is this similarity in their histories, the one being the choir and the other the nave of the original buildings.

The founder of the chapel at New Shoreham was probably William de Braose, grandson to the first lord of Bramber, who had made a gift of four churches with endowments to the monks of St. Florence Saumur, in Anjou. The deed of gift is now in the possession of Magdalen College, Oxford, which became possessed of it through Bishop William of Waynfleet, in 1459, and is thus patron of the livings. In its turn the chapel gave place to the church, of which first mention is made as having been begun by the monks in 1103. It is still later spoken of as "capella" in the taxation of Pope Nicholas in 1291, when its architectural importance must have been far greater than that of its mother church. At what time it became a separate parish is unascertained.

The church, as now existing, consists of the choir, with north and south aisles; the tower, placed over the crossing; north and south transepts, and one bay of nave; transepts and nave being covered with wood framed roofs. Of the nave the greater proportion has been destroyed. It probably consisted of six bays with clerestory and aisles. Its full extent is shown by a large fragment of the west end wall, which is still standing, and by considerable remains of its north and south walls which show above ground, and which there is every reason to believe were built of flint or sea-beach cobbles, with stone dressings, in the same manner as those walls now standing.

Originally about 198 feet long inside, more than 40 feet longer than Oxford's little cathedral, it has from some cause, not clearly ascertained, lost the whole (with the exception already mentioned) of the grand Norman nave, of which Steyning, a few miles inland, will give a good idea. Of this length the choir is 70 feet long by 20 feet wide. Across the transepts it measures 80 feet by 20 feet, the tower rising to a height of about 80 feet. The work of building the nave, transepts and tower begun in 1103, and was continued and added to during the best Norman period, following in a remarkable degree the fortunes of the family of its first founders, who, as we have seen, provided so largely for its progress and maintenance. The work remaining shows all those features to be met with in the style named: the square abacus with the peculiar hollow moulding under; the cushion caps to the square and semi-circular members of piers, notched out at the corners to lessen what would otherwise be a crude projection; the arches with deep recessed faces, with, in some instances, the chevron and label mouldings over. You find as the work proceeded, although full of indications of axe-faced stone (I need scarcely remind you that all Norman stonework was dressed with the axe diagonally), better finish, and a greater advance towards the refinement of the Transitional period, which had scarcely begun when the choir was commenced.

The Transitional period had made but little progress when the monks began the work of building the choir we now see. The Norman church had no doubt an apsidal termination at the east end, and in all probability others similar to both north and south aisles. To what extent these projected towards the east there is now no means of ascertaining, except perhaps by excavation, but the heights are clearly shown by a certain roughness on the eastern face of walls and arch supporting tower, also by weather mouldings which still exist to former roof.

The builders perhaps commenced by pulling down at the east end. Although there is no real proof to establish this theory as a fact, there can be no doubt that the later east end was begun just at the period of transition from style to style. Consequently, we find the most remarkable progress from the Norman to Early English as step by step this noble choir was built.

It is this choir which is now of chief interest, and claims our reverent attention as students, for architects must ever be students. Begun to be built at the time when the new style originated, it progressed slowly towards its completion, and one might almost sum up the means and resources its builders were possessed of. It consists of five richly-arcaded bays in the triforium, and clerestory to nave and north and south aisles. All are vaulted with moulded stone ribs filled in between with stone chalk; simple but effective quadripartite vaulting.

But the variety of treatment is to be seen, not described. On one side you have the sturdy circular columns of the

* "Haura" is debased Mediæval Latin for "havre"—a harbour.

Norman period used in conjunction with the octagonals of Early English type, on the other columns of engaged shafts supporting pointed arches with the deep hollows and rounds of the period arranged, as it were, in well-defined squared reveals, such as belonged to the style the builders were trying to free themselves from, with moulded and boldly-carved foliage to caps and bases.

On the one side the shafts for vaulting spring from floor, on the opposite from quaint corbels or carved foliage. There is the single Early English arch of triforium with its recessed faces and chamfers on the south side, and again the richly-moulded trefoiled arch to the east on north wall, alongside double-arched lancet lights westwards.

In the side aisles, as if in conservative admiration of the preceding style, a Norman arcading goes the full length of walls, and a stone seat for the accommodation of the monks.

Over the arcade are small round-headed windows. These windows are, however, chiefly modern insertions copied from an original.

The foliage to caps and to the enriched arches north side of nave will repay careful study. Sometimes one is inclined to think portions have been carved *in situ* without much setting out, and the way the carver has had to bring in his parts to finish is such as no modern architect would allow; we are far too precise and exact. We should not pass it, but the charm is there, and we feel that it was carved by a man.

Perhaps it would not be an error to assert that some of the carving to be found in the pier caps and some corbels to vaulting shafts was carved by one who had seen or carved similar work at St. Nicholas, Blois, Normandy. There was a constant intercourse between this port and the Continent; Richard I, John and Henry III. all made use of it. The various members of the De Braose family upheld this intercourse to an equal extent with the foreign trade, for they had obtained and secured to Shoreham the right of "free port," a great privilege, and nothing was easier than to select skilled craftsmen whenever required, just as they brought over the stonework. Beside this they retained their original possessions abroad and had enlarged the churches of them.

In one of the publications of the Cambridge Camden Society is the statement that some carving here in the form of mulberry leaves is in allusion to the family of Mowbray, one of whom married an heiress of the De Braose and became possessed of the estates.

This is said, I suppose, of the carving to arches on north side of choir, but there can be but little doubt that this portion of building was finished about 1200 or 1240, and the happy selection of John de Mowbray did not take place for many years after, for he was only thirty-six years old when he had the misfortune to be beheaded in 1322.

Of course we are well aware that this sort of allusion to a family name was of frequent occurrence in all kinds of decorative work, and took the various forms required, being most familiar to heralds. There is that very beautiful brass in Broadwater Church (mother parish to Worthing) to a rector, John Mapleson, who was also chancellor to Catherine, wife of Henry V. Here the maple leaf was freely used in allusion to his name, just as in heraldry the Lucys bore three "Lucies" or, the Shelleys their "shells," or the Tremains their "hands." All these details add undoubtedly to the interest and history of our subject; but in this case may not be quite true.

I am afraid no words of mine will convey to you the full impression of the nobility, the grandeur and repose, the charm of masses of light and shade, the variety in treatment and growth of this fragmental building. Look at the dedication crosses so frequent on the piers. I should like to see, and can fancy I see, the monks working with small means and slow progress, day by day, dedicating their finite work to the Great Infinite, as bit by bit they managed to begin some other portion of their liberal-minded, planned and spaced building; building their big hearts into their work as stone by stone was raised to be amongst the best and most permanent of all examples to architects.*

We are apt to forget that money and labour was just as dear in the old days as we so frequently feel it to be now, and that "here a little and there a little" had necessarily to be done when the means could be found. Perhaps to this we owe much of the charming variety of style and detail to be found in old work. We don't always appreciate the result, and I suppose an architect will never be allowed to design a church, for instance, in a variety of styles, or in any way approach the lesson the teaching of the ages has been to him.

The late J. H. Parker, of Oxford, declares, I think with truth, that photography alone is the great handmaid to the architect and archaeologist. In reference to the actual finish of details, the tool marks and jointing of masonry, nothing

could be better for bringing the facts before the student, and I think our Society therefore is much to be thanked for the liberal use it makes of photos and lantern enlargements. I am relying to a very great extent on this very point, and I trust the views shown will illustrate and make clearer to you the beauties of the church, as I feel they ought to be known. There is one feature of the east end worthy of notice, because it implies a certain amount of design for appearance only. The elevation is in two tiers, well defined and divided by string-courses. The lower storey has three circular-headed recesses with angle shafts, carved caps and transition mouldings to arches. The centre recess is pierced for a window, which was reopened in 1832; the other recesses are said to show traces of similar windows.

Above are three unequal-sized lancet windows, with piers and clustered shafts between, whilst the mouldings to arches are almost exactly those of the arches under them. Still higher in gable is a good wheel window, consisting of twelve lights, with small shafts and moulded caps in between. The whole forms a very fine east end; but the wheel window is not in the church, although filled with painted glass—it is above the vaulting.

The space above vaulting is difficult of access and its surface left very uneven; one is at a loss therefore to give the reason for this design, except for outside appearance. The small circular windows in side aisles are also above the vaultings.

I do not propose to go over every period in the history of the building. I wish to direct attention to its architecture, and not exhaust the subject; as you will surmise, much more could be said and many other details given.

To mention that the tower was begun by the Normans is but to repeat that which I have already said. This was added to in the Early English period to the extent of at least one storey higher. Flying buttresses were built to the nave of choir, and at a much later period several Perpendicular windows were inserted. At about this time also the west wall was built, to enclose the church within its reduced limits, which cut off the ruined portion, and this was done with Norman fragments. The present arch over the west door consists of stones worked with the chevron and other mouldings of the Norman period, but built as a pointed arch, calling to mind the alteration and rebuilding with old materials of the chancel arch at Broadwater in just the same manner, although not for the same reason.

In recent years the wave of "restoration" has swept over the building, and in its course swept away several Perpendicular windows inserted in south aisle, to make room for copies from "the antique;" in other words, an attempt was made to blot out a page of the church's history. I know I am now treading on dangerous ground without knowing the influence brought to bear upon the architect, but at the same time I am afraid architects have, by such work, frequently merited the censure antiquarians have awarded them, and the destruction of history is in my opinion to be regretted. Here again photography does us a good service and records the destroyed windows.

I must rely upon photography to show by way of contrast within easy distance a few other Sussex churches, such as the Saxon church at Worth, near Three Bridges, Old Shoreham, the tower of Southwick Church, and Sompting; also an interior of Chichester Cathedral. The churches in this district are usually small and without aisles, frequently without towers and without west doors, such as Old Shoreham, St. Botolphs, Coombes, Bramber, &c., and frequently also without west windows; the towers, where they exist, usually covered with low pyramidal roofs. Steyning, which was formerly a place of equal importance with Old Shoreham in its early history (for shipping came up the Adur much further inland, and no doubt contributed greatly to its trade and capacity for building its church with the fine Norman nave), never had a west door. The reason for this omission may be that the district is much exposed. It has frequently suffered at various times from great storms. There are in Sussex many stone and shingled spires, such as West Tarwig and Horsham spires. The manner in which the broach spire is placed upon the tower is particularly beautiful and the proportions most excellent.

To account for the small size and poverty in building churches within a distance of three or four miles inland, I think we can say the district has always been pastoral and the population small, just as it is at present.

In the church of New Shoreham there are now no monuments of interest, except one unknown brass of the early fifteenth century. All the windows and church fittings are modern. The font has been taken down and rebuilt in different places three times within my knowledge, but it still retains nearly the whole of its interest as an example of the square-shaped basin and base, with flat arcading on the four sides of basin, standing on columns, to be found in Sussex. Built of Purbeck marble it has well withstood its several other removals during a period of nearly 800 years, for at one time it must have been placed in that portion of the church now ruined.

* I have in mind a paper read a short time ago on "Freemasonry" before the Society.

MEANS FOR MITIGATING THE FADING OF PIGMENTS.*

IT is not my intention to-night to enter into the causes of the fading of pigments, whether water-colours or others. Were I to do so I should have to keep the meeting considerably longer than either they or myself would consider desirable. I think I must take it for granted that the conclusions Dr. Russell and myself arrived at in 1888 (the date when we made our report to Parliament) have not been controverted or whittled away, and may be accepted as correct. I must, however, quote two of the concluding paragraphs:—"It may be said that every pigment is permanent when exposed to light 'in vacuo,' and this indicates the direction in which experiments should be made for the preservation of water-colour drawings;" and "our experiments also show that the rays which produce by far the greatest change in a pigment are the blue and violet components of white light; and that these, for equal illumination, predominate in light from the sky, whilst they are least in sunlight and in diffused cloudlight, and are present in comparatively small proportions in the artificial lights usually employed in lighting a room or gallery."

At the end of the report we make some reference to glazing the skylight with yellow glass, and point out that it would be inexpedient to do so, as, although the safety of the pigment's colours would be thereby insured, or at all events be made more certain, yet in such a light the hues of these blue pigments would suffer to the eye.

The first method of preserving the colour of pictures by placing them in vacuo has been experimented upon by a company, and it would not become me to say what success they have attained in this direction. The method that I have adopted to minimise fading has been in the direction of controlling the kind of light admitted to the pigments. The point from which I started was from the results of the experiments made as to the fading of different pigments under coloured glasses. The glasses employed were red, green and blue, which are approximately the three primary colours, and it may be instructive to show you the rays which these three glasses allow to pass. If in front of the slit of the spectroscope a piece of red glass is placed we see that the spectrum is deprived of all the green and blue rays, only red, orange and a few yellow rays being transmitted. With the green glass the red rays are almost altogether absent, as are also the violet, but the green rays are strong, as are the blue-green, and there is a fair proportion of yellow and blue rays passing.

With the blue glass the violet and blue pass readily, the green and yellow and red are cut off, though there are two faint bands apparent in the yellow-green and in the red. It will be noticed that practically these three glasses divide the spectrum into three parts, (1) the violet and blue, (2) the green and yellow, and (3) the orange and red. The following table shows how little action takes place under any glass except the blue, and our statement that the greatest fading in white light is caused by the violet and blue rays is founded on it.

	White	Blue	Green.	Red.
Purple Madder . . .	Faded to 2	Faded to 1	—	—
Antwerp Blue . . .	No experiment	Faded	—	—
Leitches Blue . . .	Sl. faded	Sl. faded	Darkened	Darkened
Violet Carmine . . .	Faded to 1	Faded to 1	—	—
Payne's Grey . . .	Faded to 1	Blue	Blue	—
Indigo . . .	No experiment	Faded to 1	—	Sl. faded
Prussian Blue . . .	No experiment	Sl. faded	—	V. sl. faded
Rose Madder (two experiments) . . .	Sl. bleached	Sl. faded	—	—
Brown Pink . . .	No experiment	Faded to 3	—	—
Crimson Lake . . .	No experiment	Faded	Sl. faded	Sl. faded
Vandyke Brown . . .	No experiment	Faded to 1	Sl. faded	—
Vermilion . . .	Darkened	V. sl. darkened	—	—
Carmine . . .	No experiment	Faded to 3	Sl. faded	—
Gamboge . . .	No experiment	Faded to 1	—	—
Indian Yellow . . .	No experiment	No change	—	—
Sepia . . .	Become lighter	Become lighter	—	—
Burnt Sienna . . .	No change	No change	—	—

Other experiments have shown me that the violet rays are the most active in producing fading, as they are also in producing an ordinary photographic image. If we can eliminate the freshness of these rays from white light without appreciably altering the colours viewed in such light, we shall practically have prolonged the life of a picture. At first sight that these conditions can obtain may appear problematical; but I trust that you will agree with me shortly, that we can so cut off the rays without injuring the hue of the colour.

Now I must ask you to take it from me, from a series of experiments made, that ultramarine is the colour whose dominant colour is nearest to violet end of the spectrum; and when I say dominant colour, I mean a colour which has approximately the same colour as the spectrum colour, though it may be mixed with white light to a variable amount.

We can show the dominant colour of some pigments. For instance, here is an orange pigment; I can match that in the spectrum by one orange ray. Emerald green I too can match, but we must have a certain amount of white light mixed with it. Pure ultramarine, too, we shall see, has a dominant wavelength well below the G Fraunhoferline. It therefore follows that if we illuminate all pigments with a compound light, in which this ultramarine colour is included, they must appear appreciably the same as they do in white light.

I must guard myself, however. Do not let us suppose for one instant that these dominant colours are alone those that are reflected from pigment. They reflect a good many more. We can show that this is the case. I place a pigment in the patch of monochromatic light from the spectrum, which can be changed at will, and the more luminous the pigment appears in any particular colour, the more of that particular light we know is reflected. Thus we place emerald green in the patch and we see that it reflects but little red, more yellow, a maximum in green, and a very little blue. We also find that vermilion reflects a maximum in the red, very little yellow, and practically nothing else. Ultramarine, we find, reflects a very little red, no yellow, a very little green, plenty of blue, and some violet. If we cut off the violet from the spectrum and place the ultramarine in it we shall, however, find the colour appreciably the same it was when the violet was present.

A variety of experiments made with these different pigments tell us that the loss of the violet of the spectrum is practically no loss at all. Even with white light the loss is unnoticeable. If we form a patch of light composed of all the colours except the violet, we shall notice but very little change from the pure white which is alongside of it.

Having established this fact, we are now in a position to go a step further.

In the apparatus I have here at hand I can place three slits in the spectrum, and by means of a convex lens of proper focal length and curvature, I can cause these colours to recombine and form a patch of white light, being an image of the prism. The slits are now in the spectrum, and a patch of pure white light alongside. I alter the width of the slits till they show the patch of the same colour as the comparison white. The colours are red, green and blue. Now the red and the green themselves when mixed form a yellow, and this can be demonstrated by covering up the slit through which the blue issues—you will see a yellow patch on the screen; evidently, then, since red and green make yellow, a yellow and a blue will form white light. To prove this further, I place a slit in the yellow and another in the blue, and we have white again formed. As a matter of fact, with any kind of yellow and any kind of blue there is always some blue ray and some yellow ray which will form white light by mixture. But it does not follow that such a white light is a proper one in which to view coloured pigments. For instance, in this mixture of blue and yellow of the spectrum I place an orange; you see it appears yellow, or if I place a green in it it appears whitish, and so on. I might multiply my experiments in this direction, but they would only prove that there must be something beyond a mere match of white light to make it effective as a pigment illuminant. That "something beyond" is really a continuous spectrum. That is, every ray must be present except the violet rays, which have been shown to be practically useless for giving illumination (I may mention that the yellow ray has about 200 times the illumination of the strongest violet ray, which we can spare without detriment). Where a portion of the spectrum is altogether absent or deficient those pigments whose dominant colours lie where these deficiencies are to be found must inevitably alter in hue, just as we found to be the case just now. If we can get a yellow and a blue which together will have such a spectrum when combined together we shall have accomplished what we want.

Now here is a green-blue glass, such as is used for ordinary ships' lights. When placed in a beam of white light, a place in the spectrum can be rapidly found where the yellow is such as will form a white light with it, or a yellow glass can be placed in the white light and a blue ray found, which, when mixed with it, forms white light. You see the mixtures before you, and I fancy will not find much fault with them. If we compare the blue-green spectrum ray which forms the white light with the light coming through the yellow glass, we find that it matches the blue of the glass very closely. Evidently then we can mix the light coming through these two together, and they should also form white light. This we can easily test. The blue glass is now in one beam of white light and the yellow in the other. By superposing on the same screen these two lights, and then reducing them to proper proportions, we see that we have a white light which is a very close match to that of electric light.

Another step further we must go. Is the blue-green glass of that type which cuts off the proper amount of violet light? This we can answer at once by an appeal to the spectrum. We have the spectrum of the electric light on the screen, and place in front of the slit the glass. You will see that the violet almost entirely disappears, leaving the blue bright, but cutting

* A paper by Captain W. de W. Abney, C.B., F.R.S., read before the Society of Arts on Wednesday, May 15.

off the red. We can do the same with the yellow glass, and we find that it cuts off all the violet and a deal of the blue-green. We have seen what sort of a white a mixture of the two make, and we can tell what kind of a spectrum they make by rapidly rotating in front of the slit a sector in which are the two glasses showing proper proportions. We see now the spectrum of the combined lights upon the screen. It is quite different to that of white light, for there is no violet in it, and it has perhaps rather more green-blue in it, but this is an advantage, as it shows that the blues will not suffer when viewed in such a light. In fact a little more predominance, if anything, will be given to the blues. Had I used the ordinary cobalt blue glass you will see that I should have gained nothing in safety. The spectrum, with such a glass interposed before the slit, is again on the screen. You will remember that it is a banded spectrum, admitting all the violet and blue, cutting off the green, but allowing a band of yellow and two of red to pass through. As the blue-green glass cuts off the violet, we may take it that it is much safer to use light coming through it than ordinary white light, as far as the fading of pigments is concerned. It was in experimenting with this glass that I came to the conclusion that if we used the light passing through it as one component of a mixed light, and could find a light passing through a yellow glass which would neutralise it, we should have a valuable means of securing greater immunity from fading than we have by using white light alone. The yellow glass I have shown you was selected, not as the most perfect sample, but as being very transparent. If anything, it wanted a trace more red with it, but without it we get a combination which ought to answer every purpose. Let me show you how some pigments look in this light. I place a lens in front of the lantern and make a disc on the screen. Where the rays cross, a rotating sector is placed containing these two glasses, so that the disc is alternately illuminated by the blue-green and yellow-white. The change is so rapid that the two colours blend one into the other. I place various coloured pictures in the beam and note their appearance, and then illuminate them with ordinary white light of the same intensity. We find that the two are almost exactly alike, every colour shows in the one as well as in the other, and apparently a difficult problem is solved.

I well remember the first small experiment which I tried with these glasses. It was in a small photographic studio which we have at South Kensington Museum, erected for the use of outside photographers. A small portion was curtained off and the roof glazed with these glasses in proper proportions. Water-colour sketches were taken into this light and critically examined by some whose opinion I highly value. The chairman, for instance, whose exhibit at the New Gallery shows him to be a colourist of no mean order, approved, and so did the director for art, Mr. Armstrong.

So successful was the appearance that an experiment on larger dimensions was made by the authorities of the museum, when part of the roof of the gallery in which the Jones collection is housed was glazed with these glasses. The public freely circulated through the gallery, and as far as I know the criticisms which were passed were few, and certainly not as a rule condemnatory. The committee of artists, who acted as advisers in art matters to Dr. Russell and myself, when carrying on the investigations as to the fading of pigments, and of which Sir F. Leighton was the chairman, give it as their opinion that the lighting was satisfactory.

When the Raphael Cartoon Gallery was to be re-roofed the authorities directed that the glazing should be carried out with these coloured glasses to prevent, as far as possible, any further fading of these valuable works of art. The glazing is in alternate strips of the two colours (some few panes have been glazed with ordinary white glass to allow for slight modifications in the proportions of the two colours, if considered desirable) on the slope of the roof. The light, before coming into the gallery, traverses a flat skylight of corrugated white glass, which distributes and scatters the colour, even when sunlight streamed through the coloured panes. It has been a source of amusement to myself to stop in this gallery and note the effect the light produced on the minds of the different parties who passed through it. The large majority of persons saw nothing peculiar about the light, and failed to notice the coloured glasses in the roof, whilst others noticed it and could not understand what it meant. Americans seemed to be those who were most observant.

I have had the advantage of hearing the criticism of several artists regarding the lighting of this cartoon gallery, and the general dictum was that the colour and lighting were satisfactory. One artist told me he wished he could always have such a warm light in which to exhibit his pictures. He said it was a most becoming light. In choosing the proportions I was led to make a mixture which imitated as far as possible a warm sunlight. When the light is principally from the blue sky, this meant that the yellow light predominated a little more than it would do when the mixture was made by the electric light. In order to arrive at this colour, I took sunlight itself as the standard white, and adjusted the proportions of sky light

passing through the two glasses in such a manner that the warmth of sunlight was found in the mixture.

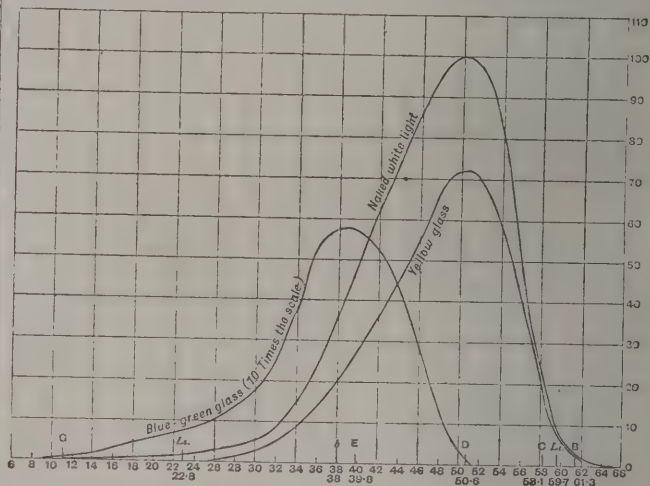
It may be of interest to know what the illumination is compared with glazing by white glass, that is, how much is cut off. This can be very readily ascertained by measuring the luminosity of each colour coming through the glasses.

We can make the experiment for ourselves.

First, I place the yellow glass in one white beam and alongside it send another beam of white light. By intervening a rod in the paths of the two beams, to cast two shadows, and, reducing one by rotating sectors, which can give a larger or smaller aperture at will during rotation, we can arrive at a point where the two shadows are equally luminous.

Removing the glass, the balance is again secured, and we find that in this case the aperture required is 60 deg., and in the other 85 deg., showing that the yellow glass allows 12-17ths of the white light to pass through it. We can do the same with the blue-green glass, and find it cuts off a deal more, allowing only 1-6th of the light to pass. Now, if half the roof be glazed with yellow glass and the other half with the blue-green glass, the total light passing through is only 45 per cent. of what would fall through the aperture of the roof if no glass were in it. Absorption and reflection reduces that loss to about 50 per cent., a great diminution, it is true, but still one which is made up for in several ways. In the Raphael Cartoon Gallery the open area in the new roof is considerably larger than it was in the old roof, and the light is practically the same as it was before. Further, the use of ground glass or blinds is done away with, ribbed glass being substituted. The ribbed glass, as before stated, helps the mixture of the two colours when falling on the pictures.

I do not say that the lighting is perfect and that improvements cannot be made in it. Science never comes to a finality, but I am bold enough to think that it is a step in advance. What may be termed the "fading value" of the light can be



readily ascertained. In the diagram before you we have the photographic absorption spectra of the blue-green of two yellow glasses, and of the two mixed lights. It will be seen that the violet is totally, or very nearly, inactive. In the ultra-violet there is a carbon band which is intensely active, photographically, in the electric arc light. This is slightly transmitted through the yellow glass, but in sunlight these rays are so weak that they only appear after very prolonged exposure. What the effect is may well be judged by taking an ordinary photograph in this gallery and in the adjoining one. I find that a bromide plate requires nearly ten times the exposure in the former than it does in the latter, when photographing a picture. Bromide of silver, being sensitive to the green, does not show such a difference as chloride of silver does. Here are two pieces of such paper exposed for equal lengths of time, viz. one hour, in each of these galleries. You see that whilst the piece exposed in the ordinarily lighted room is quite dark, the photographic action appearing on the other is very small.

What the extension of time for fading is I cannot say. Putting it as low as ten times, we have a considerable saving. Thus, a picture which in ordinary light would last ten years will, if hung in this light, last at least 100 years, and probably 200 years. In some calculations made in our report, Dr. Russell and myself stated that it would take 100 years in one of the museum galleries for pigments to arrive at the fading shown by our experiments. Had this glazing been adopted, we should have to have increased this time to at least 1,000 years instead, a time sufficiently long to enable further advances to be made in the knowledge of what will completely hinder all fading.

I have now shown you the reasons which led me to experiment with this glazing and to judge it as efficient. I trust the lighting of this Raphael Cartoon Gallery may prove not to be merely a safe experiment on a large scale, but a real step in the right direction, which may with advantage be adopted elsewhere.

Mr. W. F. Reid said that artists would only be too glad if they could obtain such pure colours on their palettes; but they could not dissociate colour from the material which produced it; and he should like to know if definite experiments had been made on the chemical action of light on the substances of which the pigments were made. With regard also to the medium with which the pigments were affixed to the substance, they knew that there were few substances in which the media used did not act. Even cellulose or paper had a certain chemical action on most pigments which were applied to it; and they naturally looked to one who was in the habit of using pigments to know how far the action of light would be modified by the chemical action of the medium to which they were united. The action of the invisible rays had been touched upon, but he did not quite catch what the action of the ultra-violet rays might be, or whether they were totally excluded. It was known that they acted chemically with very great vigour, but he did not know whether that action was altogether excluded by the coloured glass. The practical aspect of the question was of course very important; it would no doubt be possible to have artificial light of this kind in large public buildings, such as picture galleries, but he did not know how far it would be applicable to ordinary houses. It was quite clear that light of all kinds had a great influence, and perhaps the reason why such bright paintings were found in the Pyramids and in Pompeii was because they had been completely protected from the chemical action of light. If Captain Abney could point out any means of preserving paintings or the surface of woodwork covered with different pigments, it would carry a ray of hope to many people.

Captain Abney said the question of the chemical action of light on pigments was a very long business and the matter was still *sub judice*. The experiments were still going on, and as yet no report had been made, so that he was afraid he could not enter upon statements which at present he was unprepared to substantiate. With regard to the action of the ultra-violet rays that was a very small fraction of the radiation which affected pigments and must almost be disregarded. He did not suppose the ultra-violet radiation in sky light was one-fiftieth part of that which acted, and therefore if it were not dealt with at all, practically speaking no harm would be done; there might be some very slight effect, but it would be of no importance. But as a matter of fact these glasses cut off nearly all the ultra-violet. The violet bands in the arc were very strong and required a very great deal to cut them off. He had said in the paper that his starting-point was when Dr. Russell and himself tried pigments under different coloured glasses, and though that was quite true his researches dated back to a much earlier period. He used to be taken to church and sat in the chancel, where there was a window glazed with zigzags of blue and yellow, and it was always a great puzzle to him that his prayer-book was beautifully illuminated with white light. He had given them the explanation that evening, but it was a great puzzle to him for many years, and it was not until the colour experiments were made that he was able to answer the question he put to himself so many years before. If you could illuminate a small church with windows of this kind you could illuminate houses, though he did not say they should do so, but that was one way in which they could do it, and still have all the benefits of white light, and without the irritating effects which the ultra-violet rays were supposed to exercise on the retina. The retina of the eye itself was fluorescent, and whenever there was fluorescence it seems probable that nerve irritation may be set up. Houses might be glazed with quinine cells to get rid of the ultra-violet if thought desirable. He feared that was the only answer he could give to the questions which had been put.

BEATING THE BOUNDS.

AT a period when parish and district surveys did not exist or were not more accurate than some of those belonging to the Tithe Commission, it was necessary to trace boundaries periodically. The practice is not yet apparently obsolete in Sussex; but the misadventures which attended explorers on Monday may, however, be a recommendation of beating bounds and lead to a revival of it in parish councils. The following account by one of the beaters of the archaeological survival is taken from the *Sussex Daily News*—

When a quiet party of Hailshamites drove through the quiet High Street at 7.15 on Monday morning, at the commencement of a 25 miles' tour of the boundaries of the parish, it was not generally noticed that they numbered thirteen. Starting under such an omen, they could not have entirely escaped casualty without seriously impairing the belief in a popular superstition. But, indifferent to simple arithmetic, they started in a uniformly merry mood and discordant attire. Some had succumbed to the force of habit rather than given in to the necessities of the occasion, and completed their toilet with the studied nicety and completeness of professional men, which one or two had afterwards reason to regret. Others had

unearthed garments which had done better service than they appeared capable of rendering in the future; while a few, with some experience of "bound-beating," had equipped themselves in a highly judicious manner. The formal start was at Leap Cross. Opposite the Union the conveyance was temporarily discarded, and Mr. John Clay Pitcher, who had taken part in the last ceremony of the kind, assumed the lead of the party.

Mr. Pitcher, hatchet in hand, was the first to disappear in the thick hedge opposite the Workhouse and force his way through. He was quickly followed by the remainder, and the path was taken across fields and gardens, where the poultry set up a commotion similar to that with which they greet the rising sun. There was a general look round for a red head—an article which has, it is said, before now been mistaken by the feathered tribe for his Solar Majesty—but without result, and the shrill ovation was accepted as a tribute to a heroic band. Through several delightful fields, aromatic with spring flowers, softly carpeted with the young grass, and spangled richly with gill-cups and daisies, the party, with buoyant spirits, and lungs appreciatively receptive of the fresh morning air, wended their way to the matutinal melody of the nightingale in a wood close at hand. Harebeating was reached at 8.15, and the party resumed their acquaintance with the road, but only to cross over to another extent of meadow. At Goad's Farm commenced their day's experience with the "quont." The "quont," it may be mentioned—the correct orthography of the word is doubtful—is a long pole varying from 12 to 16 feet, with a "T"-piece at the bottom, used by the "lookers" over the marshes to negotiate the numerous "sewers" or dykes with which the country abounds. Most of the party were more or less familiar with this invention, but there were some to whom it was quite a novelty. They, however, at this early stage of the walk, where the dykes are narrow, used it with fair success, the older members of the party shaking off their years like magic, displaying the agility of youth and the facility of experience. A little further, after numerous escapades through hedges, across ditches and over stiles on which Mr. Pitcher left his hatchet's mark, an arch was discovered, which, while performing the functions of an aqueduct, also divided two parishes. The majority were quite content to remain outside of this, but Mr. G. T. Green made an exploration of the interior, without serious disfigurement. At Amberlane a bit of May blossom was plucked, declared by all present to be the first seen this season. Shortly afterwards, through a cottage garden bearing a wealth of apple blossom, the "beaters" emerged into the Battle Road and resumed their seats in the conveyance.

Here they became reminiscent. Mr. Terry vouchsafed the information that the first recorded ceremony of the kind in Hailsham was in 1685 and the last in 1875. It transpired that three of the present party had taken part in the latter—Mr. Pitcher, Mr. R. Vine and Mr. Boniface. In that year three of the survivors of the former "bound-beating," twenty years before, were "summoned by Government" to show the way, but from various causes they were unable to respond to the summons. One of these three, in the person of Mr. Henry Boniface, still survives. Mr. Burton retailed this gentleman's anecdotes of the old way of doing the thing, from which it appeared that the "beaters" used to be hired at 5s. per day. They took three days to complete their task, and had actually to "beat" the bounds, as well as walk through the ditches, and here and there, where any distinguishing mark was lacking, dig out a cross on the turf. They were accompanied by a Government official, who provided refreshments for all comers. Only those who had been on a former round were hired, the recruits qualified for the succeeding beating, and thus a knowledge of the bounds was preserved. It transpired, too, that on Sunday morning, at Hailsham Church, the Rev. W. J. Clay read that part of the Homily for the Sunday in Rogation Week having reference to the beating of the bounds. An inquiry casually arose as to the origin of the term "Leap Cross," and Dr. Gould supplied an explanation in the form of an acrostic. The cross was the sign post, and it pointed in the direction of Lewes, Eastbourne, Arlington and the Poorhouse, in the initials of which words will be read the present designation of the spot. A short halt was made at Carter's Corner to contemplate a huge reclining stone marking the spot where, before the revised demarcation occasioned by the Local Government Act of 1894, four parishes united, viz. Hailsham, Wartling, Herstmonceux and Hellingly.

Having taken to foot again, the "beaters" made their way to Gildredge Farm, occupied by one of Mr. R. Overy's tenants, the farmhouse standing in two parishes. An attempt was made, in order to observe strict accuracy in going over the bounds, to enter this by the window, but two iron bars precluded every one, except the slim young son of Mr. J. J. White, from performing this feat. The visit of the party had been anticipated, as was evident by the sacks spread over the floor in front of the window, and—what was a much more exhilarating sight—a supply of ale which Mr. Overy had thoughtfully provided. In the garden of this farm the promise of abundant

fruit on the plum trees, of which the flower had already blown, and the unusually luxuriant blossom of a large apple tree, were particularly noticeable. Getting again into the marshes, the pedestrians fell to discussing Mr. Guy's unintentional plunge in a certain dyke at the last "beating," and had scarcely had their last smile over this adventure when the ill-omen of the start began to work. Lo and behold, one of their own number—the journalistic member of the company, too—stood before them a dripping victim of his inexperience with the "quont." The majority accepted the situation with the heartiest humour, but the unfortunate cause of their mirth, it is to be feared, momentarily forgot the piety he had imbibed on the previous day, and, needless to add, did not share in the general hilarity. However, he had the benefit of the doctor's gratuitous advice, and this it will be no breach of gratitude to extend to others similarly circumstanced, which was, "Keep moving." For the time a solitary victim, he was not long left comfortless, and before the walk was half ended there were several "comrades in adversity." Many minds were exercised in the attempt to christen the spot with a fitting commemorative name, but the effort was abandoned in favour of a possible memorial in some elegant and enduring material. Later, however, the imagination was exercised with much fertility, as will be seen, in adding to the alliterative nomenclature of the neighbourhood.

Soon Herstmonceux Church came into view, and, after traversing a large number of nameless or unpronounceable fields, the party halted for refreshments at New Bridge about ten o'clock. The next place of note arrived at was "Snapson's Wall," a broad roadway between two dykes. Meanwhile Mr. E. Vine had proved himself the champion expert with the quont, and Mr. A. K. Burtenshaw but a novice. At least, he failed to clear one of the brooks, but had the misfortune to drop in shallow water. The "red gate," a well-known landmark on Mr. Pitcher's property between Hailsham and Pevensey, was reached at eleven o'clock. Mr. E. Vine's luck had meanwhile deserted him, for, endeavouring to negotiate an unusually wide stream, with Mr. Boniface's recumbent back as a "spring board," he had, owing to the treacherous mud at the bottom of the water, and the consequent instability of the pole, landed in mid stream, and got soaked to the waist. But if he had beaten the first "plunger" in regard to the depth of his bath, he was ere long eclipsed by Mr. Terry, who, at the dyke near the white bridge erected by Mr. Pitcher, was seen struggling up to his armpits in a dyke successfully negotiated by Mr. Thompson and Mr. Lade. "Terry's Tribulation" was the inspired designation of the scene of the catastrophe, as "Vine's Vicissitude" was that of the last mischance. Rickney was passed at 11.30, due note being made of the "H" and "P" built in brick in the cobble wall and signifying respectively Hailsham and Pevensey, and the proceedings were assuming an unexciting character, the talk degenerating into dissertations on agriculture, when another wide ditch stood in the way, in which the doctor, despising the friendly help of the quont, came to grief. The place is henceforth to be known as "The Doctor's Dip." At Marling Bridge, amongst others, the Rev. F. Clyde Harvey, vicar of Hailsham and chairman of the Parish Council, joined the party, and, essaying his first dyke with a too ready remembrance of his college days, and a reckless forgetfulness of the time that has passed since then, paid the penalty of his rashness by alighting just short of the bank, to the detriment of his nether garments. This was the last watery mishap of the day, and the spot is now known as "Vicar's Folly." One o'clock found the party at Polegate Station, and as the line runs between the parishes of Hailsham and Willingdon, this was unceremoniously crossed, much to the mystification of the passengers on the platform. Meanwhile the Rev. Clifford Aston and Mr. Tolhurst, two of the members for Polegate, had joined the company, who, by invitation, adjourned to the residence of the former and were entertained to a three-course lunch, which came most opportunely, and for which thanks were heartily, if informally, returned to the reverend gentleman.

The continuation of the boundary, which goes to a great extent along the main road, was then traversed. Regarding a slough, or "slow," in the locality of Cophall, Mr. Terry had received a memorandum, dated 1685, which the vicar had unearthed, declaring that the slough, "now known by ye name of Swine's Slow, lying and being in ye highway leading from Swine's Hill to Hailsham" (about which there had been a controversy) was "equally in both parishes, and yet the inhabitants of the said parishes are to joyn and be at an equal charge with Willmington in mending and repairing ye said slow . . . in witness whereof, and to prevent all trouble for the time to come betwixt the said parishes," certain parishioners, headed by the rector of Jevington (the Rev. William Carr) and the vicar of Hailsham (the Rev. John Wenham) "hereunto set their hands." The "beaters" returned to Hailsham High Street about four o'clock, agreeing unanimously that they had had a very pleasant experience. The great regret of the lay members' company was that the Rev. W. J. Clay kept his clerical cloth unsullied by a dip in

such unblest water. In the evening the ceremony of the day was celebrated by a dinner at the Crown Hotel, the vicar presiding.

ALGERIAN ALABASTER.

THE report of Consul-General Playfair contains the following information about the alabaster quarries at Ain Smara:—

A few months ago I received from M. Cantini, the well-known marble-worker of Marseilles, a letter in which he announced to me that he had discovered some ancient Roman quarries of what he believed to be the true Numidian marble, not very far from Constantine. This was accompanied by a series of specimens of the greatest delicacy and beauty, to which he had attached names, such as Lumachelle, Jaspe, Onyx, Brèche Africaine, &c.

I saw at a glance that these were not marbles at all, properly so called, but varieties of alabaster far more beautiful than the well-known Algerian onyx. After communicating my opinion to him I received a letter, of which I subjoin a few extracts:—

"I am happy that the specimens were interesting to you, and I retain your valuable appreciation of their beauty. I am sure that you will consider them marvellous if you can examine the specimens of them which we have at Marseilles. I have neither the pretension nor the competence to enter into a discussion with you regarding them from a scientific point of view, but you will permit me nevertheless to differ from you regarding their origin.

"It is my belief, and that of others of greater authority, that these, together with the marbles of Chemtou, are the true Numidian marbles. Of course it is well understood that formerly, as now, all beautiful materials capable of being polished and employed in the decoration of buildings were included under the general denomination of 'marble,' whether they were of aqueous or thermal origin, sedimentary or organic.

"These beautiful materials, for the most part stratified, are of infinite variety. Those marked V. and VIII. frequently contain pockets full of organisms, cemented together by heat and chemical action, which caused me to name them 'Lumachelles.'

"No. XI. is the 'Brèche Africaine dorée' of the Romans, and is really a breccia composed of calcareous masses and organisms cemented together by heat and chemical action. Regarding No. XV., it represents, badly perhaps, the beautiful oriental alabaster of the columns of the ciborium in the church of St. Paul Extramuros at Rome.

"Now, regarding the doubt which you have expressed as to their origin. My quarries, both the ancient Roman ones and those which I have recently opened, are situated in the province of Constantine, between Ain Smara and Le Guettar-el-Fich, almost on a direct line between Ain Smara and Sigus.

"St. Augustine and St. Cyprian speak in their writings of Christians condemned to work in the quarries of Sigus.

"They form a nest which extends over a superficies of 4,000 hectares, beyond which there is nothing but stone and schist. In the neighbourhood of Sigus there is nothing, absolutely nothing; I have searched through the country in every direction but I have found nothing.

"The ancient quarries which I have found are not more than 25 kilomètres from Sigus, and in a perimeter of that distance around Sigus there exists none other, not even a simple vein. Therefore these are indeed the quarries in which the Christians mentioned by St. Augustine and St. Cyprian were sent to work, in order that they might die more quickly in this unhealthy and feverish country.

"I repeat, these are assuredly and without doubt the ancient Numidian marbles, while those at Arzeu are separated from Numidia by Mauretania Sitifensis and Mauretania Cæsariensis. They are very beautiful, those Mauretanian marbles, but it is improper to call them Numidian."

I have searched in vain for any mention of the quarries of Sigus in the works of St. Augustine. In St. Cyprian's letters there is only one allusion to them, as far as I can ascertain.

Amongst his letters is one from the Confessors at Sigus, "Felix, Jader una cum presbyteris et omnibus nobiscum apud metallum Siguense," thanking him for his letter of consolation and encouragement. The saint's letter in question referred to church vessels, and he said, "What a strange thing it would be if you in the mine, which is the source of gold and silver, were given gold and silver vessels." The words, therefore, in the address, "Ad Nemesianum et cæteros martyres in metallo constitutos," clearly indicate a mine whence metal was obtained, and not a marble quarry.

M. Cantini admits that there are no other mines in the neighbourhood of Sigus, and therefore he concludes that his quarries—must certainly be those in which St. Cyprian's martyrs worked, and whence the far-famed "Marmor Numidicum" was extracted.

But there was another Sigus, or Siga, in Mauretania, the first capital of Syphax, before he transferred the seat of his government to Cirta (Constantine). This is close to the great iron mine of Beni Saf, and Baluzius, in his commentary on St. Cyprian's letter, says that Baronius (A.D. 260) believed that it was at the latter Sigus that the Confessors worked, to whom the saint addressed his letter.

This, however, is a matter of small consequence, as also is the assertion that these quarries only produce the celebrated Marmor Numidicum. Every owner of a quarry, whether here, at Arzeu, at Chennoua, at Filfila or at Chemtou, is fully persuaded that his are the true Numidian marbles. Probably all are quite right. It is very possible that the name was given to all the precious building material, whether marble or alabaster, imported into Rome from North Africa, without much regard being paid as to whether it was brought from Numidia or from the adjacent province of Mauretania.

I determined to visit these quarries and to form as accurate an opinion as I could regarding them. Ain Smara, the commune in which they are situated, is 18 kilometres south-west of Constantine, on the high road between it and Algiers. The quarries are 6 kilometres to the south-east of it, in a range of limestone hills of no great elevation.

As I had foreseen, there is no marble, properly so-called, in the district; both the Roman quarries to which M. Cantini refers and those opened out by him contain only alabaster. It is finely striated, and was no doubt originally deposited by water in a horizontal position and subsequently upheaved. The bands now occur at an angle of about 45 degrees, and vary in thickness from 1 to 6 metres. Sometimes they seem to traverse the limestone rock, and sometimes they are separated from it by a layer of red earth containing a certain amount of iron.

Some of the alabaster is almost colourless or of a faint yellow tint, resembling the well-known Algerian onyx of Ain Tekbalet. It is exceedingly delicate and translucent; blocks of great size can be obtained of this, and I am inclined to think that this will prove the most valuable product of the quarries.

Other varieties, still finely striated, have been stained with iron and present every colour, from white to primrose, passing into pink and deep red. In some instances the carbonate of lime seems to have been precipitated around nodules of varying size and form, following their outline in a most grotesque but beautiful manner; again water-worn pebbles seem to have been cemented together with lime, forming a beautiful conglomerate, not a true breccia.

The variety of design is infinite, and the only objection I can conceive for the employment of this variety is the impossibility of ever obtaining two blocks absolutely identical.

The formation of this alabaster is the same as that which may be seen going on every day at Hammam Meskoutin. Great volumes of boiling water, highly charged with carbonate of lime, rise from the earth, and as it cools the carbonate of lime is precipitated in the form of cataracts, cones or striated bands; some is pure white, corresponding to the onyx of Ain Smara, some is coloured by iron exactly like the varieties I have described. I brought away typical specimens, both of the ancient and of the recent formation, and it is hardly possible to distinguish the difference.

I am not able to express any opinion as to whether this alabaster is the same as that used in the church of St. Paul at Rome, but I can testify to its having been extensively employed at the great city of Timegad in Algeria. I have a distinct recollection of having noticed small fragments of it there twenty years ago, and on revisiting the ruins only a few days before I came here, I noticed that many fine slabs of it had been unearthed at the capitol there; they evidently formed a *placage* to the cella of that noble building, and there can be no possible doubt that they came from these quarries.

It is not fair to compare one beautiful thing with another. In some respects this alabaster is inferior to the marble of Arzeu, but it is hardly possible to conceive any ornamental stone more beautiful, and whether it is the Marmor Numidicum or not it has a value quite independent of tradition, and I do not think that M. Cantini has in the least degree exaggerated its beauty.

LICENSING ARCHITECTS IN NEW YORK.

THE following is the text of the Act which has been passed by the Legislative Assembly at Albany, and has therefore become law throughout the whole State of New York:—

An Act to regulate the practice of Architecture.

The people of the State of New York, represented in Senate and Assembly, do enact as follows:—

Section 1. Within sixty days after the passage of this Act the Governor of the State of New York shall appoint seven persons from the New York State Association of the American Institute of Architects to constitute the New York State Board

of Architects, three of whom shall be appointed to hold office for one year, and four of whom shall be appointed to hold office for two years. Such appointments shall be made in writing, and be filed with the Secretary of State.

Section 2. Upon the expiration of the term of office of each member of the State Board of Architects, the Governor shall appoint his successor for a term of two years in like manner. Each member shall hold over after the expiration of his term until his successor shall have been duly appointed and qualified.

Section 3. Any vacancy occurring in the membership of the New York State Board of Architects shall be filled for the balance of the unexpired term in like manner. The members of the board shall serve without compensation or reimbursement for their services and expenses except as hereinafter provided.

Section 4. The members of the New York State Board of Architects shall, before entering upon the discharge of their duties, take and file with the Secretary of State the constitutional oath of office. They shall annually elect from their number a president and a secretary, who shall also be treasurer, to hold office for one year.

Section 5. The board may adopt rules and regulations to govern their proceedings not inconsistent with this Act. The board may adopt a seal, and the secretary shall have the care and custody thereof, and shall keep a record of all proceedings of the board, which shall be open to public examination.

Section 6. Five members of the board shall constitute a quorum, but the board may delegate the examination of applicants to a committee of less number to report the examination to the board.

Section 7. Special meetings of the board shall be called by the secretary upon the request of any two members by giving at least five days' written notice of the meeting to each member. The New York State Board of Architects may adopt rules and regulations for the examination and licensing of applicants for license to practice architecture in accordance with the provisions of this Act, and may amend, modify and repeal such rules and regulations from time to time.

Section 8. The board shall immediately upon the election of each officer thereof, and upon the adoption, repeal or modification of the rules and regulations for the licensing of applicants, file with the Secretary of State the name and post-office address of each officer, and a copy of such rules and regulations, or the amendment, repeal or modification thereof.

Section 9. Provisions shall be made by the State Board of Architects for holding examinations of applicants for license to practice architecture at least once a year if there shall be any application therefor, in each of the judicial departments of the State, and any person over twenty-one years of age, upon the payment of a fee of 5 dollars to the board, shall be entitled to enter any examination appointed for determining the qualifications of such license.

Section 10. If the examination of any applicant for license shall be satisfactory to a majority of the board, a license shall be issued to the applicant authorising him to practice the profession of architecture, upon the payment of an additional fee of 15 dollars. A person who shall at the time of the passage of this Act be engaged in the practice of architecture in this State, on presenting to the State Board of Architects an affidavit to that effect or a license from a similarly constituted board in another State, shall be entitled to such license without fee or examination. Each person licensed shall cause the same to be recorded in the clerk's office of the county of his residence, or if non-resident of the State, in the county in this State in which he shall have an office, and the clerk shall record the same upon payment to him of his fees at the same rate as for recording a deed. Upon every change of such residence or office from such county to another county in this State, the holder of such license shall cause the same to be recorded in like manner in the clerk's office of the county to which such residence or office shall be changed.

Section 11. The board shall keep on file in the office of the Secretary of State a corrected list of all licensed architects, for which purpose the Secretary of State shall keep a book wherein the full name and address shall be recorded. Any license so granted or obtained by affidavit may be revoked by the State Board of Architects for gross ignorance, recklessness or dishonest practices of the holder thereof, but before any license shall be revoked, such holder shall be entitled to at least twenty days' notice of the charge against him, and of the time and place within the county of his residence of the meeting of the board for hearing and determining such charge. The accused shall be entitled to a reasonable opportunity to produce his witnesses before the said board, and to be heard in person or by counsel in open public trial; and no license shall be revoked except upon the unanimous vote of all members of the board. The revocation of any such license may be reviewed by a court of record upon the application of any person aggrieved. If a person shall advertise or put out any sign, card or drawing designating himself as a "licensed architect" within this State

without a license therefor, in accordance with the provisions of this Act, he shall be guilty of misdemeanour.

Section 12. The license fees received by the board may be expended for the payment of the travelling and other expenses of the members of the board.

Section 13. An itemised account of such receipts and expenditure shall be kept by the secretary of the board, and a report thereof for each year ending with September 30, duly verified by the affidavit of the secretary of the board, shall be filed with the Secretary of State within sixty days thereafter.

Section 14. Any surplus of such fees exceeding 500 dols. shall be paid annually by the board to the Treasurer of the State.

Section 15. This Act shall take effect immediately.

LIVERPOOL ARCHITECTURAL ASSOCIATION.

UNDER the guidance of Professor Simpson, director of the School of Architecture and Applied Arts, the student members of the Liverpool Architectural Society paid a visit to the spring exhibition at the Walker Art Gallery. The visitors devoted their attention to the architectural drawings, an exhibition which Professor Simpson states has never previously been equalled. In the course of the review the Professor pointed out the qualities of execution in different drawings and the best means of achieving similar effects. He also drew attention to instances in which sculpture was intimately associated with architecture, as in the design by Mr. John Belcher for the building of the Institute of Accountants, London, and the same architect's design for the new South Kensington Museum. In reference to the drawings of interiors, he showed the effect and advantages of various styles of decoration, and especially of painting. The exhibition being especially rich in examples of Gothic and Elizabethan, these received considerable attention. A vote of thanks to Professor Simpson was cordially passed.

USE OF FOSSILS.

A SERIES of fossils may be looked at in several lights, all equally interesting. First of all they are the remains of many curious and interesting forms of animal and vegetable life that had never been seen living by the eye of man. They are thus interesting to the naturalist as coming in to complete the series of organic existences, and to fill up the gaps and lacunæ which are to be found in the gradations of organic beings now living on the globe. Secondly, they are interesting to the philosopher, and indeed to mankind generally, as not merely forming a portion of the great mass of organic existences, but as unfolding a history of events; as having an order of succession among themselves, proving that their several sets did not live promiscuously on the globe, but formed successive races of animals and plants, each race coming into existence, increasing and multiplying, occupying the length and breadth of the earth, and then gradually dying out to make room for their successors. They thus become records and documents of a history otherwise concealed in the depths of a remote eternity, and have well been likened to the medals of a race and a dynasty of which no other remnants have been preserved. Thirdly and lastly, they, in consequence of this succession, become of vast interest and importance to the practical geologist and miner; for as each particular set of rocks in a country is apt to be characterised by peculiar mineral substances useful to man, so we are enabled to recognise any particular group of rocks by the kinds of fossils it contains. The mere variety in the nature of the rock is not sufficient to tell us what group it belongs to, for limestones and sandstones, shales and clays occur over and over again in every group of rocks, and are often undistinguishable one from another. One little shell, or even fragment of a shell, the leaf of a plant or the scale of a fish is, therefore, often of far more value to the practical man than tons of rock specimens. In the search after coal, for instance, the rocks occurring at the surface in any particular portion of the country might be part of the group in which the coal is found, or they might belong to the group below or the group above the coal-bearing strata. In order to discover their exact position, and therefore to be assured of the chance of reaching coal below that part of the surface of the ground within a reasonable depth, the mere examination of the nature of the rock is often insufficient. The most practised geologist might be deceived by trusting to such indications alone, but if he finds in the rocks one of their characteristic fossils he is then on sure ground, and feels as absolutely certain of the relative position of the rocks as he would of the age of a coin bearing a legible impress and inscription.

The Clothworkers' Company have voted 500*l.* towards the building fund of the Royal School of Art Needlework.



"The Ten Virgins" in Lyndhurst Church.

SIR,—In your number for May 10 you criticise the mistake made by his Grace of Canterbury in speaking of this splendid work in my church at Lyndhurst as a panel painting "instead of a *fresco*"—a title in these days given popularly, but not wisely, to almost any mural painting. To the best of my recollection it is an "encaustic painting," in a process of gums and resins elaborated by the late Gambier Parry, and employed by him in his work at Ely. *Fresco*, or painting with fresh lime pigments on fresh plaster, is not often used in modern decorative work.

WILLIAM WHITE, F.S.A.

30A Wimpole Street, W.

[Mr. White's captiousness is always amusing. Apparently he is not aware that *fresco* has become a generic term, and comprises the process of spirit *fresco* introduced by Mr. Gambier Parry. This is no misapplication of the word originating with newspapers. *Fresco* was always employed in more than one sense. The late Sir Charles Eastlake, who was an undoubted authority, says that in the fourteenth century *fresco* was simply a preparatory process, the work being finished in tempera. Much variety existed also in the preparation of the walls, for many of the best *frescoes* are upon badly-constructed rubble, as at Florence and Bologna. Orcagna's great *fresco* at Pisa is painted upon laths, and we believe a wire netting was occasionally employed. In such cases uniformity in preparing the intonaco and laying on colours was hardly possible. There is also a wide difference between *buon fresco* and *fresco secco*, in which the intonaco is not fresh. Nor were lime pigments universally used, for they would not combine with colours derived from organic substances. As a long description and illustration of *The Ten Virgins* had already appeared in *The Architect*, there could hardly be an error in the reference to the subject on the 10th inst., but in a short note it appeared unnecessary to enter into details. The restriction is to be regretted, for it is evident from Mr. White's letter that if he had to fill the Archbishop's place at the Academy banquet his description of the President's work would be as hazy as his Grace's. We hope Mr. White's recollection is more assured in other matters connected with the Lyndhurst Church. His letter will not be encouraging to painters and sculptors, for it suggests that architects and ecclesiastics are alike in their forgetfulness of co-operation for which they ought to be grateful.—ED.]

GENERAL.

A "Breton Fair" is to be held at Shoreham in September, to raise funds for the restoration of the tower of the parish church.

The Report of the Society for the Preservation of Ancient Buildings on the restoration of the Cross at Chichester has been referred for consideration to a committee.

The Chilian Parliament House was destroyed by fire on Saturday last week, with the archives and library. The loss amounts to 400,000*l.*

Mr. G. F. Watts, R.A., has subscribed 1,000 guineas towards the endowment fund of the Home Arts and Industries Association. The annual exhibition of works will be held on June 13.

The Improvements Committee of the London County Council have asked for authority to prepare a scheme for the formation of a new street from Holborn to the Strand, subject to the condition that the betterment clauses of the Tower Bridge Bill shall be applied.

Four Palaces in the Politeama Adriana, Rome, which adjoin, have been seriously damaged by fire. The King of Italy was present during the efforts to overcome the flames.

M. Louis A. Barye, the sculptor, died at Montrouge a week ago in his fifty-sixth year. He was the son of the famous *animalier*, whose works were never surpassed.

The Municipal Council of Paris will have to contribute in the course of the year towards the exhibition of 1900 a sum of 20,000,000 francs.

A Portrait of Mary of Guise, which appears to be an authentic likeness, has been presented to the Town Council of Edinburgh by Colonel Mackay.

The Argyll Memorial and Window in St. Giles's Cathedral, Edinburgh, will be unveiled on Monday. Messrs Mitchell & Wilson are the architects.

The Architect.

THE WEEK.

It was generally understood that Professor ROGER SMITH was engaged on an enlargement of his book on "Acoustics in Relation to Architecture and Building," which was one of the most useful of WEALE's series. But owing to his engagements all that the Professor has been able to do is to revise the text in a few places, and to introduce some additions relating to recent appliances for the transmission and development of sound and the remedying of acoustic defects. Thus it is pointed out among other things that "the shape of a ceiling has perhaps more influence than any other part of a hall or room upon hearing than any other feature." Coves do not appear to be advantageous, and it is said that in the Queen's Hall, Langham Place, the risk which arises from them is skilfully avoided by connecting the ceilings to the walls by a surface that is to some extent convex. That low ceilings are favourable to the propagation of sound is exemplified by the success of "the temporary buildings erected in different localities for the public services of Messrs. MOODY & SANKEY, occupying as much as half an acre, and accommodating probably upwards of 4,000 people." The book was based on a paper in which, like others by the author, no trouble was spared to elucidate the subject. It has been to many the most useful book of its class, and it is as competent as before to yield precise information to students as well as their masters.

THE late Mr. HENRY SUMNERS, who died on the 23rd inst. in his seventieth year, had gained a large architectural practice in Liverpool. Among his buildings are the following:—The Greek Church, Prince's Road; Royal Southern Hospital, Liverpool Stock Exchange Buildings, St. Helens Town Hall, Cowley Schools, St. Helens; Christ Church, Linnet Lane; Peter's Buildings, St. Cyprian's Church, Edge Lane; St. Lawrence's, Kirkdale; St. Athanasius, St. Philemon's Mortuary Chapel, Collingwood Street; Baptist Chapel, Prince's Road; Royal Liver Offices, Royal Court Theatre, Liverpool Exhibition Buildings, Walton Workhouse and Prescott Workhouse. He was also engaged in the alterations to the Washington and Grand Hotels, Lime Street, and acted as consulting architect and agent in England for the Prince Alfred Hospital, New South Wales. Mr. SUMNERS gave attention to the subject of street improvement in Liverpool, and illustrations of one of his projects are now in the exhibition at the Walker Art Gallery.

THE Mitchell Library, Glasgow, should have been built with elastic materials, for more and more expansion appears to be required as time rolls on. The condition of the new premises recalls what used to be stated about the old building. In the last report, Mr. BARRETT, the librarian, says:—"It is perhaps a little disconcerting to find that, in the first general report following the removal of the library into the new premises, it is necessary to state that these are already too small for the number who desire to enjoy the advantages the library affords. But the condition of the rooms during a large part of 1894 forbids the hope that any further development can be attained without a considerable increase of accommodation. There are, of course, times when the rooms are far from full, but at the periods of maximum attendance the resources of the institution are severely pressed. It is a comparatively frequent occurrence to count in the principal reading-room from thirty to sixty persons in excess of the number of seats. Readers may be seen sitting on and below the circular stairs, standing in the passages, maintaining an uneasy balance on the base of the rail, and even prone on the floor—truly a pursuit of knowledge under difficulties." If the additions to the books continue to be at the rate of over 7,000 a year, the shelf-space will soon be exhausted. During the past year no less than 519,196 volumes were issued,

and as 115,788 related to arts, sciences and natural history, being nearly double the number of volumes of fiction, it is plain that many of the readers are engaged in serious studies.

AMONG the seventeen plays of PHILIP MASSINGER, "A New Way to Pay Old Debts" alone is considered to be worth representation, and of late years it is losing its hold over provincial audiences. "The Fatal Dowry" ceased to be an acting play when Lady MARTIN left the stage, and as PHELPS has no successor, "The City Madam" is also doomed to exclusion from theatres. In spite of his failure to retain the least sway over playgoers, MASSINGER's works should not be overlooked. He was one of the band of hacks who laboured in the garrets of Southwark in the early part of the seventeenth century, and who were unknown to all except the players, who looked down on them, and the fashionable dramatists who condescended to accept the credit for their productions. The description of MASSINGER as "a stranger" in the burial register of St. Saviour's, a parish in which he lived for about twenty years, summarises the history of many a man of genius at that time. An endeavour is now being made to erect a memorial window to PHILIP MASSINGER in the church where his remains rest, with those of JOHN FLETCHER, with whom he co-operated, and other worthies who aided in the creation of Elizabethan literature. He was purer than most of his contemporaries, for the occasional passages which spoil his plays are to be ascribed to other hands. GIFFORD and HALLAM did not hesitate to place MASSINGER next to SHAKESPEARE himself. If later scholars have not endorsed that opinion they have certainly agreed to give MASSINGER a very high place among the Elizabethan dramatic writers, and it can hardly be doubted that when the endeavour to commemorate his work in the church where he is buried is more fully known to lovers of English literature, an adequate response will follow.

A PRAYER-BOOK measuring 3 inches by 2 inches has been acquired for the Emperor's library, Vienna, which is considered to be a priceless treasure. It belonged to Prince ERNEST, the son of MAXIMILIAN II., and the brother of RUDOLPH II. It was, therefore, produced towards the end of the sixteenth century, and the twelve illustrations, which are exquisitely drawn with a pen, are in a style which GOLTZIUS might have admired and imitated. The borderings on each page reveal that the delicacy of the Mediaeval illuminators had not entirely vanished from Europe. The Archduke ERNEST died in Brussels, where he was viceroy, in 1595, and it was in that city the tiny work was obtained.

ANOTHER attempt is about to be tried to remove one of the eyesores of Paris. The building on the Quai d'Orsay, which prior to 1870 was known as the Cour des Comptes, was destroyed during the Commune. The smoke-stained ruins were allowed to remain, while in other parts of the city similar evidence of the passions of the populace were removed. Some years ago it was arranged that the Union des Arts Décoratifs were to erect a museum of the South Kensington type, and a lottery to raise funds was unusually successful. But through the mismanagement of the committee the project collapsed. It was well there was failure, for the building would be too remote from the industrial quarters of Paris. It is now proposed to erect a building which will again be assigned to the Cour des Comptes. French architects are invited to send in designs for the reconstruction. The drawings are to be deposited on August 31. They will be examined by a jury composed of the Minister of Public Works, the President of the Cour des Comptes, some senators, deputies and officials, with five architects to be nominated by the competitors. The first prize will be 7,000 frs., the second 5,000 frs. and the third 3,000 frs. There will be also five prizes of 2,000 frs. each. The area is to be limited to the old boundaries. The principal façade to the Quai d'Orsay, the façade to the Rue de Lille, and that facing the interior court are to correspond with those destroyed. There will consequently not be much scope allowed for invention in the exterior of the building.

COPYRIGHT IN DESIGNS.*

IT needs only a superficial view of any of the objects in shop windows and catalogues marked "design registered" to realise that English law is indifferent to beauty or suitability of form, and that absurdities can be secure of protection under its ægis. As there are schools in which design is taught at the public expense, it is natural for some people to suppose there is a connection between design in the lawyer's and manufacturer's sense of the word and the artist's. It is not the fault of the legislature if anybody is misled. The statutory definition of design in the Act of 1883 is sufficiently comprehensive to comprise worse degradations of human ingenuity than used to be seen in the old Chamber of Horrors at Marlborough House. According to section 60, "*design*" means any design applicable to any article of manufacture, or to any substance artificial or natural, or partly artificial and partly natural, whether the design is applicable for the pattern, or for the shape or configuration, or for the ornament thereof, or for any two or more of such purposes and by whatever means it is applicable, whether by printing, painting, embroidering, weaving, sewing, modelling, casting, embossing, engraving, staining, or any other means whatever, manual, mechanical or chemical, separate or combined." The legal net is so wide-mouthed that the most amorphous things can get into it, and thereby are on an equality with forms and arrangements which are the creations of men of genius.

In a story by the late Miss METEYARD we read of a designer who, having received a commission for an ink-stand, and being anxious to produce something beautiful, begged of an astronomer to allow him to pass his nights in the observatory watching the stars until inspiration came down to him. In the eyes of the law that masterpiece (assuming it to exist) might have to succumb to some trumpery piece of manufacture brought out a little earlier, which the courts considered bore a slight and accidental resemblance to it, and the sidereally inspired work dare not be sold under a penalty. For it is not form or fitness of purpose or even rationality in the arrangement which guides the judges, it is merely a question of novelty. Baron POLLOCK once laid down the principle in the following remarkable words:—"A man might register a design for a doorway made with bronze, and made with a figure of the APOLLO BELVEDERE, that might or might not be better or worse than a doorway that had preceded it; but it would be foreign to the question altogether whether it was properly the subject matter of a design and whether it was new as a design under this Act, although it had none of those advantages. The only question then would be this, You must use your eye and say, looking at the figure or the design, whether it is new or it is not, and beyond that you cannot go."

It must be understood, too, that to be new does not mean novel in form. There is really no need of invention to become a designer in the legal acceptance of the word. The present is a week of racing, and losers may be glad to learn that if one button bear a representation of a jockey and another will show a horse, then if on a third horse and jockey are combined (it is not necessary to put the rider in the saddle), according to Mr. Justice COLERIDGE a new design is created. It is quite possible the made-up design would be preferred by the public and become more profitable than one modelled by Mr. WATTS or Mr. BROCK. The honeycomb pattern has as little novelty about it as the circle; a "designer," however, once placed large honeycomb cells as a bordering to smaller honeycomb cells. An English jury found the design to be new and original. The verdict was set aside by the Court of Exchequer, but it was upheld on appeal. Mr. Justice WIGHTMAN stated on the occasion, "It was said by one of the learned judges of the court below that the constituent parts of it were old and the novelty was only in the arrangement or combination. Why? A picture which contains within it a novel combination of old parts is a new drawing, and it seems to me if no one else has ever combined them in the same manner, it would be a new design within the protection of this Act of

Parliament." Academicians who so humbly implore the presence of judges at their banquets must be flattered by the judicial notion of pictorial composition. Let us take another example which has become a leading case. For some mysterious reason there are not many varieties of patterns of spoons. The fiddle pattern, king's, thread, rat-tail, and beaded have possession of the English market. A brilliant idea was conceived by a manufacturing firm. They resolved to supersede all the accepted patterns by a new spoon, and of course a fork was included in the scheme, on which Westminster Abbey appeared. It appears "the registered design consisted of the shaft of a spoon, and on the top of it a representation of Westminster Abbey seen from a particular point of view; the two towers and the pinnacles were there, and the transept with buttresses." As was to be expected the courts decided in favour of the novelty of the design. The view was taken from a photograph, and we suppose somebody interested in the rat-tail or other monopoly suggested that at least there ought to be an adaptation of a subject to fit a space in order to constitute a design, but the late Lord Justice BOWEN scouted that theory. The legal and legitimate theory was thus expressed by his lordship:—

The novelty may consist in the applicability to the article of manufacture of a drawing or design which is taken from a source to which all the world may resort. Otherwise it would be impossible to take any natural or artistic object, and to reduce it into a design applicable to an article of manufacture without also having this consequence following, that you could not do it at all, in the first place, *unless you were to alter the design so as not to represent exactly the original*; otherwise, there would be no novelty in it, because it would be said the thing which was taken was not new. You could not take a tree and put it on a spoon, unless you drew the trees in a form in which a tree never grew; nor an elephant, unless you drew it and carved it of a kind which had never been seen. An illustration, it seems to me, that may be taken about this is what we all know as the Apostles' spoons. The figures of the Apostles are figures which have been embodied in sacred art for centuries, and there is nothing new in taking the figures of the Apostles, but the novelty of applying the figures of the Apostles to spoons was in contriving to design the Apostles' figures so that they should be applicable to that particular subject matter. How does a public building differ from that? In no sense, it seems to me, and the photograph of a public building does not differ.

It was held by Vice-Chancellor MALINS that a copy of a portrait of a public character applied upon earthenware was not a new and original design, but that decision is not accepted as authoritative. The courage that was exhibited in converting a portrait to base uses would now be considered by the courts as identical with designing power. We have, in fact, in the decisions about designing another instance of the anarchy that prevails in English institutions. The public pay in the art schools for laying down doctrines, about avoiding direct imitation in industrial design and the necessity of transformation in the forms to give them fitness, while in the courts the judges are paid to expose the foolishness of such doctrines. To the minds of the judges mere form is of less consequence than priority of use. A man made a china lampshade in the shape of a rose, but it was declared to have no novelty, because there was registered an earlier shade in linen formed like a rose. But he could have legally applied the identical form to many other uses if he pleased. This was shown by a decision in the case of an iron company that introduced a door with a moulding on the top in a range. Lord MURE, in his judgment, said:—"There is evidence to show that such a door as this was not unknown in certain kinds of doors; but I am quite clear, upon the evidence, that it was new as applied to kitchen ranges." The change in purpose was sufficient to establish the design, and probably the more remarkable is the incongruity the more deserving it is of protection. This conclusion is suggested by what Lord Justice LINDLEY said in the Westminster spoon case:—"If you ask whether anybody has previously taken this particular aspect of Westminster Abbey and used it as a design applicable to things in Class 1, or to any things like it, the answer is, 'No, that is new, and never has been published before.' That answer seems to me to bring the plaintiffs' case within the Act of Parliament." It did not seem to come within his lordship's province to suppose that the avoidance of the use of Westminster Abbey by generations of spoonmakers was evidence of unsuitability, and that as such a *motif* could not be considered as eligible by men who were competent to judge, it did not come

* *The Law of Copyright in Designs.* By Lewis Edmunds, D.Sc., LL.B., assisted by T. M. Stevens, M.A., B.C.L., and Marcus W. Slade, B.A. Sweet & Maxwell, Limited.

within the terms of the Act if an equitable interpretation were employed. We must, however, remember, as an excuse, that in technical cases judgment is given in words which are not defined by lawyers in the same sense as by practical experts, and hence it must follow that inconvenience occasionally arises.

There is no doubt that English manufactures would be elevated in character and be more esteemed throughout the world if less indifference to design, using the word in its ordinary sense, were exhibited in Acts of Parliament. The legislature is undoing the work of the art schools when it sanctions ugliness, vulgarity and unfitness. A country which unblushingly adorns its spoons with views of abbeys, puts the doors of Greek temples on kitchen boilers and makes lamp-shades like full-blown roses, gives opportunity to its foreign rivals to make little of its capacity. One of the causes of the indifference which is doing so much harm to English trade probably arises from the difficulty of realising what is being done in every term. It seems incredible, in spite of the array of law books, that, prior to the appearance of the volume in the production of which Mr. LEWIS EDMUNDS was aided by Mr. STEVENS and Mr. MARCUS SLADE, "no work specially devoted to the Law of Designs, and attempting a complete treatment of the subject, has appeared for many years past," and that "such scanty treatment as the Law of Designs has received at the hands of legal writers has generally been incidental to the treatment of other subjects." The anomalies which arise are therefore not likely to be made known to the press, which is still the pioneer in the reform of abuses. The volume on the "Law of Copyright in Designs" will therefore be advantageous if, directly or indirectly, it affects public opinion, and leads to a more satisfactory system.

But the law as it exists causes grievances besides those which arise out of the disregard for æsthetics. The procedure that is indispensable is full of pitfalls for the unwary. Thus, a design may be registered in one class and legally pirated in another class. The registration of a design may be refused by the controller at his discretion, and "there is no restriction as to the grounds upon which the refusal may be based." Where marking is necessary, a slight oversight is likely to be fatal to copyright. In one case mentioned a manufacturer of room-papers stamped every piece with the proper mark. But patterns which were cut off the pieces were not all marked, and it was decided that the Act was not complied with. In another case of trimmings, an attempt was made to show that the little units should all be marked. Mr. Justice KEKEWICH decided that if the proprietor sold the trimmings in pieces of 144 yards, they must be marked, and if he sold them in small pieces for patterns or for use, they must equally be marked by a label or printing. A design for dusters was registered. Twelve dusters were produced in each piece, and there was a gummed label on each piece bearing the proper mark. But it was held by the Vice-Chancellor there were twelve articles in each piece, and therefore the marking was defective. As regards infringement, it is not a difficult nor an unsafe operation to a specialist. The late Master of the Rolls said that a fair imitation of an original kind was not an infringement, and the words can be interpreted liberally. According to Lord WESTBURY, "When a pattern is registered as a whole, anything which is a facsimile is an infringement, anything which produces it in its integrity; but that which is different in shape or form, or in the relative positions of the different parts, which is not a reproduction of it, would not be an infringement." Nor is the penalty for infringement always heavy enough to deter. In the Westminster spoon case, which is illustrative of so many points in copyright, all that was inflicted was twenty shillings in each of the two cases. According to the Act, the infringer is liable to forfeit to the registered proprietor of the design a sum of fifty pounds for every offence, but the Courts are not disposed to accept the words literally and inflict a fine of fifty pounds for every tile or spoon produced. But the proprietor can bring an action to recover a sum equal to any loss he may have sustained.

The procedure of registration is not without inconvenience, and it may lead to actions and losses. But on the whole the results in sterling coin are worth the trouble. Thanks to the official system, exceptional artistic power is no longer needed to attract fortune. Registration is the

most effective process yet devised, or that could be devised, for putting bad and good, sane and insane, designs on the same footing. That is equitable, for the foolish design pays as much to the State as the finest. The multitude of people in this country are no more competent to distinguish between suitable and unsuitable designs, or to judge of ornament, than they are to analyse the stuff employed in patent medicines. In both classes of productions they take an official mark or stamp as evidence of value, and as long as the Exchequer is enriched nobody cares how much harm may arise. The judges are, therefore, acting in the proprietor's interest when they insist that registration marks shall be definite, for they are like the hall-mark on gold or silver. The more medicines and designs brought out the more satisfactory will be the financial returns, and the supporters of the party in power then rejoice. If a similar stimulus to the patriotism of the Greeks were offered in the old days, probably they would not be satisfied with a very few varieties of ornamental forms which the artists refined instead of superseding. Government is now more costly than in Athens, and by the law of compensation inventiveness is increased to an extent that is without precedent.

However, we must take Government as we find it, with its shortcomings. At least the producers and proprietors of designs which are worthy have a right to be protected, for every application, appeal, notice and request means an addition to the revenue, and it is well that information should be available which will enable them to guard against piracy. This has been done, and well done, by Mr. LEWIS EDMUNDS. His book might be called "A Guide to the Patent Office," for as much importance appears to be attached to what takes place in Southampton Buildings, as in the courts of law. It is not often a barrister is discoverable who is so painstaking in making all things clear for laymen. Mr. EDMUNDS's "Copyright in Designs," can, therefore, be recommended as an invaluable monitor in all offices where industrial designs are produced, for attention to the instructions may often safeguard a valuable property against the enemies who flourish by taking advantage of oversights.

JAMES BARRY, R.A., ON ARCHITECTURE.

IT could not be doubted by any of his contemporaries that the organ of combativeness was largely developed with JAMES BARRY. The portrait of himself which he introduced in one of his big pictures in the room of the Society of Arts represents him as seated humbly in a corner, and looking towards the spectator with the wistful eyes of a man who was destined to be deprived of his due measure of appreciation. But the panel he holds in his hand has on it a very unworthy figure which he painted as a type of Royal Academicians, and by which he wished to suggest that in his opposition to them he resembled HYPERION against a satyr. BARRY could not cease to be contentious when producing works that were unique as examples of the noblest self-sacrifice. All through his life he was militant, and it must be said that when he was most extravagant and inconvenient to other men, he believed he was contending for what was right and true. His aspirations as an artist were always after the sublime (as it was understood in the latter half of the eighteenth century), and in his conduct he imagined he was following the examples of saints and martyrs, or it may have been of PLUTARCH's heroes. The well-known words which his patron, EDMUND BURKE, employed in a letter of advice, suggest how well he was acquainted with BARRY's peculiarities, in believing that his actions could not be wrong because his intentions were unselfish. His wise words are worth repeating, for they cannot be too well remembered. "Believe me, my dear BARRY," said BURKE, "that the arms with which the ill-dispositions of the world are to be combated, and the qualities by which it is to be reconciled to us and we reconciled to it, are moderation, gentleness, a little indulgence to others, and a great deal of distrust of ourselves, which are not qualities of a mean spirit, as some may probably think them, but virtues of a great and noble kind, and such as dignify our nature as much as they contribute to our repose and fortune; for nothing can be so unworthy of a well com-

posed soul as to pass away life in bickerings and litigations, in snarling and scuffling with everyone about us." There are no doubts expressed by BURKE about BARRY's ability or his industry. However disputatious he might be in Rome or elsewhere, his studies were not neglected. When he returned to London in 1770 BARRY was unquestionably the ablest figure draughtsman in England. He was then in his twenty-ninth year.

There were no patrons awaiting him. But he was prepared to show his belief in the maxim that was so often on his lips, "No cross, no crown." If only the plainest fare, clothes and a lodging were provided for him, BARRY was prepared to paint the most difficult works. The practice of art was to him "an exceeding great reward." He had not long arrived before he offered to co-operate in the decoration of St. Paul's. The scheme was not approved. At a subsequent time he was more happy, for the Society of Arts accepted BARRY's offer to paint gratuitously the great room in the house in John Street, Adelphi, with a series of pictures which would demonstrate that the happiness of mankind is promoted in proportion to the cultivation of knowledge. He was afterwards compelled by his poverty to solicit permission to have the series exhibited to outsiders on payment, and in that way he received about 500*l.*, to which the Society added 200*l.* On that money he lived during several years. He was appointed professor of painting in the Royal Academy, but BARRY was one of those men who believed that the repetition of the same course of six lectures year after year would not make great painters. He tried to alter the arrangements, and wished to secure all the aids and appliances which the students required. He was outvoted, and as he would not abandon his efforts on behalf of efficient training, he was expelled from Somerset House. BARRY was one of those heroes whose best memorial is the list of their failures.

It is necessary to sketch BARRY's character in order to understand how he came to speak about architecture. In his Academy lectures he treated of the art in some of its relations to painting. But at an earlier period, and soon after his arrival in London, he presented some novel views about architecture in his "Inquiry into the Real and Imaginary Obstructions to the Acquisition of the Arts in England." The production of a work of the kind was characteristic of the man. By the "imaginary obstructions" BARRY signified the fatalistic philosophy which was in favour at the time, and according to which, by a law of nature, Englishmen were not furnished with any of the ability which was necessary for all those who would follow the fine arts. The condition of patronage was enough to give a sort of plausibility to a theory of that kind. The dealer then, as now, was the arbiter of taste, and dictated what was to be purchased and what was to be neglected. In our time fortunately he finds it more profitable to traffic in the works of living artists. In the eighteenth century most money could be made by the discovery, purloining or fabrication of Classic "antiques" or Renaissance masterpieces. BARRY was familiar with all the mysteries of dealing. He appeared so poor and powerless that he was allowed to see and hear all that took place in Italy. He discovered that DA VINCI's *Last Supper* was repainted by an Irish monk, so degraded was the state of art in Italy, and in the purlieus of Rome he beheld stranger operations. BARRY had to put some restraint on his revelations, and in one place he apologises for his want of faith in the connoisseurship of people who were distinguished by rank and fortune. But he informs them that "it would be endless to give an account of all the various ways in which our antiquaries and picture-dealers, with their whippers-in and dependents, both at home and abroad, carry on this business of imposition; let it suffice to say, that it is the most difficult thing in the world for any travelling gentleman who may be inclined to purchase, to avoid the springs and the nets that are so artfully laid there."

It was notorious how much money was expended every year by Englishmen on works by artists most of whom never heard of in England. Rich men in other lands were not overcome by a similar weakness. It was therefore allowable for theorists about things in general to conclude that English patrons were forced to purchase foreign works because there were no native artists to produce pictures or statues. It was the business of the old logic to uphold

fallacies, and EUCLID was not more rigid in his conclusions than MONTESQUIEU when he demonstrated that, in consequence of their climate, Englishmen were in a perpetual state of dislike for all things, including life itself; that, owing to the prevalence of north-easters, the fancy of poets was sickly and oppressed, and that even the liberty of the people was due to their disposition towards suicide, since it was as easy to get quit of life in opposing a tyrant as in dying in one's own chamber. There were martyrs enough among the English artists and writers to support every theory about English indifference to arts and letters. Any philosophic Frenchman who saw BARRY going about in an old green baize coat and feeding in cook-shops, or observed Dr. JOHNSON treasuring up orange-peel, or was astonished at DICK WILSON's waistcoats made out of his landscapes, would be disposed to say there was not much difference between the possessors and the claimants for patronage.

If the philosophers had asserted that motion of globular objects was impossible in England owing to the density of the air, it might be difficult to disprove what was said by any force of logic, but a practical demonstration was within the reach of all. BARRY need only have referred to works of art produced by his contemporaries, and his case was gained. They were not forthcoming. REYNOLDS's or GAINSBOROUGH's portraits, WILSON's landscapes which were lying rolled up in garrets, HOGARTH's moral satires, were not the kind of works which would overwhelm foreigners and bring them to conviction. BARRY was, therefore, compelled to adopt a roundabout process of argument—to go back to the time of HENRY VIII. and trace all the neglect of art to his misgovernment; to investigate atmospheric phenomena, in order to discover the influence of climates; to inquire into the effects of education, religion, &c.; to compare the bodily structure, and so on, in order to excuse that indifference by which he was compelled to suffer. Before his time martyrs had prayed for their enemies, but JAMES BARRY was the first who composed a treatise to palliate the offences of those who were depriving him of life.

His remarks on architecture arose out of the desire to vindicate England. Every man of taste at that time believed that the Gothic buildings were barbaric, and were productions which were enough to warrant all the conclusions about the impossibility of producing noble works of art. The weakness for them testified that the English were to be included among the family of Goths, who were the destroyers of that ancient civilisation which no efforts could revive. BARRY disliked every Gothic form, but he would not allow any one to say that the style was a northern product. He boldly took an opposite view. "The manner of building called Gothic," he says, "is vulgarly supposed to have been the invention of the Goths, and that it was carried into Italy by those barbarians after they had established themselves upon the ruins of the Roman empire; but the contrary was the fact. It had its birth in Italy, and it crossed the Alps in company with all the other declining arts, which were happily preserved by the friars and other religions, and which they transplanted into the Gothic kingdoms. There are no proofs that the northern peoples had any species of architecture at all before their intercourse with the Romans, or that their habitations were other than holes in the earth, or at best built of wood, mud and chaff, as is still practised in some parts of our islands. The beginnings of Gothic architecture are traceable in those buildings erected in Italy before the arts were much declined and long before the Goths had any footing there." BARRY was able to support his theory in a way that was creditable, for we believe he was the first to realise that Gothic derives its character from its roofing. He saw "in the second arcade of the second floor of the Amphitheatre of TITUS," and in the Baths of DIOCLETIAN, examples of vaulting "meeting in a point in the centre of four pillars as the arcades cross one another." At Hadrian's Villa he observed "the same sort of roof, where the four sides of the vault meeting in a common point in the centre of the roof, each side gives to the eye exactly the appearance of the Gothic pointed arch, although they are in reality made up of two half circles crossing each other." When the central points are raised, as in the church of the Minerva and elsewhere in Rome, there is, he says, exactly the

Gothic roof. The prototype of the clustered column he believed he saw in two columns in the Pantheon, in which the fillets between the deep fluting have on them a semi-circular moulding. Gothic capitals he derived from the Corinthian. But ornament obtained in that way, although it might have a merit of its own, could never be comparable with Greek work. As he said, "the great difference between the Grecian ornaments and all others is, that the Grecian taste for embellishing grew up amongst them whilst they were cultivating all the sciences and when the arts of design were in perfection. Their philosophy, eloquence, poetry, painting, sculpture, music, &c., made one mass of education, and reflected light and improvement upon each other. The graces were the production of this joint effort, and architecture, which has not any archetype in nature to direct and govern its embellishments, became ornamented by emanations from that stock and order which resulted from the united exercise and knowledge of those arts that had, and, like another PANDORA, the Grecian architecture was decorated with gifts from the gods." When arts and sciences were again unified in England, no less satisfactory a consummation would be reached.

The progress of the century and a quarter since BARRY wrote would be satisfactory to him if he were alive, for the artistic power and patronage which he could not see is now forthcoming. A philosopher of our time would be laughed at who endeavoured to make out that in the bodily frame of Englishmen there was so much heaviness as to make it impossible to attain the level of other nations in art. In how many contests has the contrary become manifest? While so much is evident it is well to remember those who, in spite of their own trials, had faith in the ability of their countrymen, and among them must be numbered the genius some of whose speculations we have endeavoured to explain.

THE INSTITUTE OF ARCHITECTS' ELECTION.

A MEETING of Associates of the R.I.B.A. was held on Monday, May 27, at 8 P.M., at Dr. William's Library, Gordon Square, W.C., to consider the replies received from candidates for the R.I.B.A. Council to the following letter, and to consider the desirability of electing a permanent associates' committee:—

"May 20, 1895.

"Dear Sir,—We, the undersigned Associates, are anxious to obtain your views upon the question of the qualification for the Fellowship of the Institute, and we should, therefore, take it as a great favour if you would be so kind as to forward a brief reply to the following question to Mr. H. V. Lanchester, 12 Great James Street, W.C., before Friday next.

"Are you in favour of restricting the Fellowship of the R.I.B.A. to (1) Associates; (2) other architects who were in practice before 1880, and (3) those whose work is of exceptional merit.

"In the case of the latter would you advocate that photographs of their executed work should be exhibited in the Institute rooms for one month before the election?"—We are, yours obediently,

London.

T. C. Agutter, E. Milner Allen, John Anderson, R. S. Ayling, Roger F. Bacon, R. Shekleton Balfour, Ernest R. Barrow, Sydney B. Beale, John Begg, T. H. Bishop, Arthur J. Bolton, T. Gardhouse Charlton, Arthur W. Cooksey, Henry A. Crouch, Erskine S. Cummings, Langton Dennis, Owen Fleming, B. F. Fletcher, Geo. McLean Ford, William A. Forsyth, James S. Gibson, William Grace, William D. Gravell, Sydney K. Greenslade, Geo. Harvey, Walter S. Hewitt, Francis Hooper, Leonard V. Hunt, J. A. R. Inglis, Harry Jefferis, W. Ed. Johnson, D. W. Kennedy, Geo. Kenyon, H. E. Kirby, H. V. Lanchester, Allan J. Meacher, John Murray, J. E. Newberry, James Paxton, Thomas A. Pole, Percy Pratt, Andrew W. Prentice, Harry W. Pye, T. Duncan Rhind, S. B. Russell, Henry A. Saul, Edgar H. Selby, John W. Simpson, J. C. Stransom, W. T. Tapper, Arnold A. Taylor, A. H. Ryan-Tenison, F. W. Troup, Sydney Vacher, W. H. Ward, Robert Watson, W. Arthur Webb, Fredk. Ernest Williams, Ernest A. E. Woodrow, E. W. M. Wonnacott, J. B. Mitchell Withers.

Provinces.

Charles E. Bateman, W. H. Bidlake, Harold Brakspear, Jno. G. Dunn, Alfred Hale, T. R. Kitsell, Henry J. Lanchester, Herbert R. Lloyd, H. L. Paterson, Alfred Reading, G. O. Scorer, James R. Wigfull, Arthur Needham Wilson.

Mr. Owen Fleming presided, and about 58 attended, this number including candidates for the R.I.B.A. and 30 Associates. Twenty-six supported questions No. 1 and No. 3. No one present supported question No. 2, but 25 supported No. 1, No. 3, and the subsequent question, a rider to No. 3. A number of letters from prominent architects were read in favour of questions 1 and 3, and most of them included No. 3. Considerable time was taken up in discussion, with the result that it was determined at present only to form a committee of Associates, R.I.B.A., to look after the interest of the juniors, and 19 were elected members of the committee. The proceedings terminated with a vote of thanks to the chairman.

TESSERÆ.

Expression in Architecture.

THE term "expression" came into use with descriptive writing about art, and is freely applied to creative work of all kinds. Pull the word to pieces and you get *ex*=out of, and *primere*=to press or squeeze out, to declare, utter, signify. Now, in one sense, there is hardly any object devoid of expression, if the term be taken as covering some differential external quality, as in a ship, or animal, or tree. But in respect of art the word is employed in a higher sense, rather as revealing some unique internal quality. And here the thing signified is almost as hard to define as the flavour of a fruit or the odour of a flower. Here we mean by the word the pervading grace, the special quality of attractiveness, the unique character of poetic interest that the poem, or picture, or building has. From whence comes this poetic interest? Wherein lies the secret of its charm for us? Art of all kinds comprehends the forms in which men of genius utter what is in them. Art is the speech of poetic minds, and a work of art acquires its poetic interest by the simple fact that the artist has pressed out of his imaginative self the master qualities of his mind, and imparted these to his work. The thing speaks for the man and of the man. Hence the adage, "The style is the man." There is always found in the work of a man of genius an emotional quality of style which gives us so much more than the outward garb of the thing.

William Hogarth.

Hogarth has been called "a writer of comedy with the pencil," but there is much more of the deepest tragedy in his works. Most of his subjects are entirely of his own invention; and in the story of what may be called his dramas, he adheres more closely to nature than the generality of even the best dramatic writers. His profligates and villains never reform unnaturally at the conclusion of the story, but die as they have lived, villains and profligates; nor are there to be found in his conceptions of character any of those inconsistencies by which dramatic authors appeal to the passing prejudices of the time, or seek to propitiate a mixed multitude—in the majority of which the moral taste is never of the highest standard. He does not give his prodigals generous and noble qualities, nor is trickery ever countenanced in his stories by the practice of people he means to represent as respectable. In truth, though the stage seems to have suggested to him the species of art of which he may be considered the inventor, yet his views of life were much too sound to allow him to adopt the loose notions of stage morality. Wit is not easily expressed without words, but there is exquisite wit in Hogarth, and his humour is utterly inexhaustible and as rich as the humour of Shakespeare himself. Extreme as are his incidents, there is no exaggeration, and the enduring truth of his representations of life is confirmed by the occurrences of every day. Some of his scenes, from change of manners and fashions, may not be exactly acted now, but his characters are eternal. He has been charged with caricature, and "The City Volunteers attending the Lord Mayor's Procession," the slight etching called "France," and one or two other instances from among his numerous productions, may fairly be given up as caricature; but taken altogether, nothing can be more distinct than the art of Hogarth from that of the caricaturist—a distinction which he has well pointed out in the etching he published to refute the charge. No painter whatever and but few writers have laid bare the evil dispositions of human nature and their inevitable consequences with such a mastery of illustration. He has traced wickedness and profligacy through all the degrees of villany, recklessness, passion, hypocrisy and cunning, cold, calculating selfishness. Yet, never losing sight of nature, he here and there shows us touches of good—and often, as in the world, where we least expect it. The episode in "The Rake's Progress," of the poor girl's story to whom he has broken a promise of marriage is very touching. She offers her hard earnings to release him when he is arrested for debt—she follows him to prison and ministers to him in the last scene of his wretched career, the mad-house. In the "Election Dinner" also, in the midst of corruption and disorder a poor tailor steadily resists the bribe of a handful of gold almost forced upon him, while his masculine termagant wife threatens him with her vengeance.

for having a conscience ; and in another of the election pictures, the "Polling," the dignity of human nature is supported by the maimed veteran who, having lost both hands and a leg in the service of his country, has contrived to place his hat reverently under the stump of one arm, while he lays the hook which serves him for a hand on the Bible. The oath of this man is sure to be conscientiously kept. It is clear from these and many other incidents of a like kind spread through Hogarth's pictures that had he been a writer he never would have conceived Swift's "Yahoos." His heart would not have allowed him, much less his judgment—for he knew that in the degree in which satire is exaggerated it always loses its power. Hogarth was a painter of nature in the highest sense, as distinguished from a painter of matter-of-fact ; and that he did not aim at mere literal truth is shown by many little circumstances in his pictures—among which may be mentioned the lightning pointed with an arrow-head in the fourth print of "The Rake's Progress." The barb is directed against a noted gaming-house in St. James's Street, and the expedient is adopted to attract attention to its direction. Indeed, close literal representations of many of his scenes would be utterly intolerable ; and therefore, as Fielding, an author with whom he had much in common, and Gay, have each redeemed so revolting a subject as the history of a highwayman by a peculiar treatment far from literal, and by making it a vehicle of general satire, so Hogarth has dealt with the scenes of vice he exhibits, in which the mind is perpetually carried away from what is presented to the eye by general allusion, by wit and by humour.

Reynolds's Window, New College, Oxford.

At first Thomas Jervais, who died in 1801, was distinguished for exquisitely finishing small subjects. At Lord Cremorne's villa, Chelsea, was the most complete collection of his early works, consisting of about twenty pieces. The interior of Gothic chapels and castles is exhibited with rays of sunshine, producing the richest effect. In priority of excellence, if not of time, the first is the great western window of the chapel at New College, Oxford. He was paid for the figures of the lower compartment 50*l.* each, 70*l.* extraordinary for the group of Charity and 8*l.* for the lion's head attached to the figure of Fortitude. Total 428*l.* For the whole of the upper compartment 1,100*l.* was paid to Jervais. Sir J. Reynolds received 231*l.* for the use of the cartoons. So that the whole amounted to little less than 2,000*l.* His widow in 1802 publicly exhibited for sale thirty-seven small pieces, which he had reserved as being of more perfect workmanship. She valued them at 2,000*l.* The design was made by Sir Joshua Reynolds, and is divided into two parts. In the lower compartments are placed upon pedestals, in chiaroscuro, seven female figures, larger than life, representing the Christian graces and the cardinal virtues. It is difficult to determine which of these may claim the highest merit. Temperance and Charity are generally preferred ; but Sir Joshua himself gave the palm to the figure of Hope, reaching forward to heaven. The middle compartment of the higher division represents the Nativity, the leading idea of which is evidently taken from the celebrated *Notte* of Correggio, originally at Modena, now at Dresden. The cartoons were dispersed among several proprietors. The Duke of Rutland had the *Nativity*, for which he paid 800*l.* ; the Duke of Portland some of the accompaniments, bequeathed to him by Sir Joshua ; and the Marquis of Thomond the others, with the seven figures. Lord Orford was so enamoured of his Flemish histories and rich mosaics that he was blind to the perfection of the new school of glass-staining. In one of his letters he speaks of Sir J. Reynolds's "washy Virtues" at New College, which is too severe a sarcasm. If the colouring be too faint it was the fault of Jervais ; but was there nothing to be said of the design, expression and grace of the outline?

The Study of Old Masters.

The great importance of the study of the older and greater masters of art, and of the consideration of the means by which they arrived at extraordinary excellence in so many varieties of style, become most apparent when we examine the works of the moderns, who usually exhibit, in comparison with their predecessors, so much of feeble conventionality of treatment, so much unimaginative sameness of design and so little pains taken in perfecting the execution of their pictures. For the object of all criticism ought to be improvement, and it is not by merely discovering and exposing the faults of his contemporaries, but still more by becoming acquainted with the excellences which distinguish the works of perfectly accomplished painters, that the artist and the student of the present and the future time may be stimulated to brilliant and successful exertion. There is no excellence of drawing or of colour which may not be acquired by that ceaseless diligence and toil to which every successful master, from Michel Angelo to Caracci, from Bellini to Titian, and from Perugino to Correggio, devoted himself with unremitting industry. Purity and grace of design and richness of poetic imagination lie dormant in many a mind only because it wants the opportunities of education, and it has

not yet created for itself an intellectual refuge against vulgarising tendencies of public and social life. There is no rendering of beauty or grace, there is no image of simplicity or purity and no representation of grandeur and power, whether in passionate action or in intellectual repose, which does not also elevate and improve as well as delight the mind of the cultivated as well as of the ignorant man ; there is no part of life or of nature, however lowly or minute, nor any phase of these, however transient, that may not become the subject of worthy artistic representation, if only the idea of it be pure, and the little of suggestion contained in it be that of truth at least. Thus in art every species of taste and of skill may find healthy employment, and the student must not despair of honourable success if he fail only in ambitious emulation of the Leonardos and Raphaels.

Thomas Stothard.

The early designs of Stothard made an epoch in art, and led to that extensive and numerous class of embellished publications which have distinguished the many literary productions of the English press, commencing with the "Novelist's Magazine," published by Harrison, of Paternoster Row, and ending with the "Italy" and "Poems" of Samuel Rogers, than whom no one appears more justly to have appreciated the talents of our lamented painter. Stothard had the rare gratification of seeing his works sought after, and the prints from them collected with eagerness by a number of admirers during his life ; nor should it be omitted that in extending his fame through the medium of engraving no one contributed more than James Heath, whose burin was to Stothard what that of Bartolozzi was to the works of Cipriani. His Canterbury Pilgrims, characters from the plays of Shakespeare, and others of his easel pictures, together with his etching of the Wellington Shield, from his own design, were appreciated. Concerning the latter, being one day asked how he could submit to the labour and drudgery of such kind of employment, his answer was, "It is the enterprise of the thing." Stothard considered the profession of an artist, and most especially the distinction of R.A. (as it ought to be), the passport to gentility ; nor was he ever known, by language or eccentricity, to lower the grade of art, however indifferent he might be to personal appearance. In his conversation he was no less original than in his designs, and his observations on men and manners were shrewd and intelligent, though his extreme deafness restricted the exercise of his powers in this way. Stothard regretted that he had not been more employed on works of greater dimensions, such as his staircase at Burleigh, but it is a question if such works would have extended his name, or created so ample a sphere of pleasure as the numerous publications from his pencil. His style was certainly mannered, but in character and expression truth and nature ever prevailed. His humour never degenerated into caricature, nor his grace into affectation. His models were in his mind's eye, but the painter's eye was ever abroad, and memory, faithful to its trust, transferred the resemblance of whatever came under his view for the purposes of art.

The Origin of Art.

The deepest instinct of man's nature is the pursuit of that which is beyond and above him. Even where the earlier traditions of the human race had all but died away, among those from whom revelation was as yet withheld, and in regions where its truths had not yet penetrated, the pure instinct of man has ever soared heavenward. The investigation and contemplation of abstract truths seemed to be the favourite exercise of that intellect which distinguishes man from the lower animals, and he soon instinctively perceived the superior nobleness of this kind of occupation and this direction of his mind, because he felt that its exercise was his peculiar prerogative among created beings. When the natural tendency to thought above and beyond this life, and the natural awe for the power of a Creator, had ripened into some form of religious belief (even among those not yet blessed by any direct message from heaven), the mind became full of grand and sweet and pure emotions, which never found adequate expression in mere language. Those emotions, nevertheless, became more real, more distinct, more ardent, and philosophy began to see in them the revelations of a higher than human nature, the recollections of a pure and spiritual world. The pursuit of such paths of reflection, it was observed, did really ennoble the heart and refine the understanding, and the diffusion of those feelings and those ideas was found to render men practically better in heart and in conduct ; for those whom they did not actually turn to the pursuit of philosophy and the higher practices of religion were at least insensibly chastened and moderated in their desires, and softened from the barbarous indulgence of their passions. But though in this world man shall never pierce the veil drawn over him after the expulsion—shall never know the depths of truth in human existence—still there are ever sent some few among the race of this earth who feel more deeply and see more clearly than their fellows some portion of its beauty ; and though common language may not divulge the experiences of those favoured few,

yet the gifted among them still struggle to publish those happy tidings of a higher state which they have been permitted to catch a glimpse of. Such are the poets and the artists—whom civilised humanity has ever honoured, and whom earlier ages even regarded as inspired, or as if they really came direct from that region above humanity with whose ideas they were filled. Poetry, however, could only express in the language of words what of spiritual truth it had to tell, through the imperfect medium of suggestive images and imaginative metaphors. But the harmonies of nature speak for themselves, in mute language, in every form of nature's works, and through these affect the feelings of the rudest and most unconscious of mankind. And the plastic and pictorial arts grew up as men found that the higher influences of poetry, the truths of the ideal world, were most powerfully and universally expressed in the countenance of man and in the face of natural things. The power of man's intellect and the judgment of his intenser feelings at last found their highest earthly sphere. They were exercised in cleansing the forms of perfect nature from the irregularities and deformities which veiled them in common life—in restoring to them their pristine purity and beauty. And the faculty that produced such works was well called creative, for its results were to most men as of creation, so little do most men dream of the existence of that which is yet ever around, above and beneath them. Such was the birth and growth of art, and in such wise did its influence steal over the race of man. If it could purify the sensual by its suggestion of the pure; if it could tranquillise and soften the turbulent and rough by its example of harmony and peace; if it could content the proud and striving by its touching memorials of simplicity and sufficiency; if, above all, it could strike the faithless with awe for the power of an omnipotent Creator, and charm the apathetic into love of the holy and the spiritual—can it be doubted what must have been and ever be the sweet and lofty influence of art upon the life of the civilised world? That which calls man a moment from the bustling anxieties and petty cares of earth, and breathes over his spirit the fragrance of those sublimer spiritual emotions—that must be surely the true civiliser, fit above all other influences to walk hand in hand with religion herself. Such is art in its highest manifestations; and all art is beautiful and valuable just according to the purity and power of the spiritual emotions it expresses; and the adequacy with which they are rendered.

Plaster Casts.

Plaster of Paris may be hardened so as to bear a more perfect polish than ordinary stucco-work, and not be very readily scratched. This is effected by the addition of certain saline substances, such as alum, borax, silicate of potash, or soluble glass. If an object in plaster, such as a bust, be soaked for a month in a solution of alum in twelve to thirteen parts of water, and then wiped and allowed to dry fully in the air, it will become so hard that it can no longer be scratched with the nail, and will lose much of the brittleness of ordinary plaster casts. Casts treated in this way become stained, and are always liable to attract moisture from the atmosphere. If baked gypsum be moistened with a solution of alum, or raw-powdered gypsum be well mixed up with a similar solution and exposed to a red heat, a mass will be obtained of a dull milk-white, or more usually a slight cream colour, which may be readily pulverised, and will set quite as well as ordinary gypsum, especially if a weak solution of alum be employed in making the paste. Casts prepared of the compound thus formed, although taking a longer time to dry, are unusually hard. They may be exposed to the weather for some time and may be washed with a sponge without injury, and even immersed in boiling water without diminishing their hardness. Those prepared by steeping in a solution of alum, on the contrary, will become quite soft; so much so indeed as to receive the impression of the fingers if soaked for a few hours in cold water. Keene's cement is a plaster prepared in this way. If carbonate of potash or pearl-ash be mixed with the alum, so as to form a basic alum, we have Martin's cement; and if for the alum we substitute borax, we have Parian cement. Common plaster of Paris casts resemble, in many respects, the dense gypsum from which a good deal of the plaster of commerce is made; and as this differs from alabaster only in its molecular structure, many persons have imagined that it might be possible to convert plaster into a material resembling that beautiful substance. The nearest approach which has yet been made to the solution of this important problem is Cheverton's invention of the so-called protean stone or plastic ivory. This substance, which is well adapted for carvings in imitation of ivory and the manufacture of various ornaments, is made by exposing the plaster cast or block of the same substance to a temperature varying from 250 deg. to 350 deg. Fahr. during twenty-four hours, by which the whole of the water combined with the sulphate of lime is driven off, and the material reduced to the condition of plaster of Paris. After undergoing this operation it still retains its form, but is exceedingly friable. Sometimes dry pulverulent

plaster is pressed into the moulds, instead of casting it in the moist state; but in this case also it is subjected to the drying process, although the plaster had been previously baked. If it is intended that the object should have a certain translucency like alabaster, it is then soaked in some transparent hard varnish, purified olive oil, or melted stearine. If, on the other hand, it is intended that it should be quite opaque, this operation is omitted. The objects are hardened by immersing them for a moment in water at a temperature of from 64 deg. to 67 deg. Fahr. This operation is repeated every ten or fifteen minutes, until the sulphate of lime is completely saturated, by which means the mass becomes crystalline and harder than alabaster. The important part of the process is the stage-wise combination of the water with the sulphate of lime, and unless great care is bestowed upon it the mass crumbles to powder. By mixing various pigments with the water, any desired colour may be given to the plaster. If sand be fused with about three or four times its weight of pearl-ash, a silicate of potash or glass is formed, which is quite soluble, and has been occasionally employed to impregnate wood, which it renders incombustible. If plaster casts be worked with this substance, the sulphate of lime and silicate of potash mutually decompose each other and form a new compound, which is exceedingly hard, bears a good polish, and may be washed with soap and water.

Berghem.

The works of but few painters exhibit more unequivocally the degrees of comparison of good, better and best, than those of Berghem. In his known early productions, the style, colouring and execution of his last master, Jan Baptist Weeninix, are so evident that such pictures are, with great propriety, designated as being in his Weeninix manner, and are readily distinguishable by a predominance of red and yellow ochre tints, and an uncontrolled or immatured style of handling, by which the just forms of nature are frequently violated. He gradually corrected these defects by making nature alone his model, and ultimately attained a style and manner combining the several qualities which give such high interest and value to his works, and place him, both as a landscape and animal painter, among the best artists of the Dutch school. That he possessed in a considerable degree a classical taste is evident in most of his landscapes, and particularly in those representing mountainous scenes, diversified with broad masses of trees and cascades of water, or when the view exhibits a wild and arid site, leading the eye over the dreary fell to distant mountains, behind whose lofty summits the sun has set and left an intervening gloom. His more familiar scenes are frequently adorned with the ruins of aqueducts, fountains, bridges and temples, rendered gay by the presence of the genial warmth of a fine summer morning, or the glowing heat of the setting sun. Such, indeed, is the variety of scenery observable in his works that he must have possessed an inexhaustible store of materials ready for his fertile and imaginative genius to combine and dispose as his judgment dictated. The beauty and excellence of his landscape delineations would have been alone sufficient to establish for him a lasting reputation; but when, in addition to his merits in this department, is added the cattle and figures which animate in so delightful a manner the various scenes already briefly noticed, it will not surely be considered incorrect in placing him at the head of the several painters who have employed themselves in the same department of art. The numerous drawings in chalk or Indian ink of animals and figures, which enrich the collections of the curious, prove how indefatigable he was in studying nature, in order to arrive at that degree of perfection which is evident in all his best works. His figures are not only admirably drawn, but there is also about them an air of graceful movement that is peculiarly attractive, and their picturesque appearance is also much enhanced by their costume, which gives them more the resemblance of the peasantry of Italy than of Holland. He was equally an adept in representing the various species of animals which compose the domestic race, showing in every instance a profound knowledge of the anatomy and of all the details which characterise the several kinds. But whether the picture represents landscapes, animals or figures, or all combined, there will ever be found a skilful arrangement of the objects, executed with a dexterity of hand that proves him to have possessed such a thorough knowledge of his art that all doubt and hesitation as to the result were, with him, out of the question. Berghem, like several other excellent painters, was seduced by vanity to attempt historical and poetical subjects, and also portraiture; but these efforts have, in most instances, been attended with failure, and such productions are in general of little comparative value.

A Sanitary Congress will be held in the Champ de Mars, Paris, from July 8 to 13. The presidents of the sections will be MM. Tollet, Bechmann, Morin-Goustiau, Hermant and De Baudot.

NOTES AND COMMENTS.

THERE is so much archæological interest associated with Chester, a society which has for its object the study of the remains deserves encouragement. Although honorary officers are forthcoming there are expenses in all societies which must be met in cash. The Chester and North Wales Archæological Society, that can show a good record, starts on its new year with only a balance of 40*l.* in hand, with a printer's bill of larger amount awaiting settlement. There is also a diminished number of members to be drawn on; last year there were 258, now there are 249. The annual report is, however, sanguine. Mr. E. HODKINSON, architect, has consented to take the office of hon. curator in addition to that of hon. librarian. In January last the new wing of the Grosvenor Museum was ready for occupation, and the members are congratulated upon having a splendid room in which to display the various objects of antiquarian interest in their possession and under their charge. The improvement committee of the Town Council have also allowed the corporation workmen to remove the Roman stones, &c., to their new positions. The Council appeal to the citizens to preserve the character of the old buildings in the city, whenever it becomes necessary to repair them. The following officers have been elected:—Hon. editorial secretary, Rev. Canon MORRIS, D.D.; hon. curator and librarian, Mr. E. HODKINSON; general secretary, Mr. J. T. POWELL; hon. treasurer, Mr. JOHN DODDS.

THE late Mr. EWAN CHRISTIAN left property of the gross value of 29,585*l.* 14*s.* 11*d.* In his will he bequeathed 1,000*l.* upon trusts for his two younger daughters, for each of whom a gold watch is to be bought to remind her, "and as a memorial, of the passing of time and the coming of eternity." Sums of 500*l.* Consols and 500*l.* Bank of England stock are to be settled in favour of each of the testator's daughters on her marriage, and he bequeaths to his daughter ELEANOR 500*l.* There are other legacies, and Mr. CHRISTIAN leaves his residuary estate in trust for his wife for her life, and, subject to her life interest, for his children. To Mr. CHARLES PURDAY a gold watch was left, and another to Mr. W. H. ESPENETT. Mr. CHRISTIAN also expressed the desire that his past and present pupils should choose each, in the order of their age respectively, a complete work from among his books.

SOME time ago it was announced that a sarcophagus found at Sidon held the body of ALEXANDER THE GREAT. It was deemed so valuable the Turkish Government would not allow casts to be taken from it. Three others, which were also fine examples, were subsequently found at Sidon, and they are all in the Constantinople Museum. A paper on them was read by Professor PERCY GARDNER at the meeting of the Hellenic Society on Monday. It was said that the great sarcophagus was not the tomb of ALEXANDER THE GREAT, who was known to have been buried at Alexandria. It was probably that of one of the kings of Sidon, which at about 380 B.C. had formed a close friendship with Athens. But the style and incidents pointed to the period of ALEXANDER, whose figure appeared on the tomb. The distinction was clearly marked between the Macedonian and the Persian dress, and the fact that a prominent figure is that of a Persian or Phœnician striking down an opponent, with Persian warriors on either side, was strong evidence that the work could not be ascribed to Greeks. In another part there were Greeks fighting Greeks, and the treatment was somewhat confused, but artistically confused, and exhibited a masterly power of expression. One of the figures was conjectured to be that of HÆPHESTION, the friend of ALEXANDER. The style was more like the Amazon sarcophagus at Vienna than any other extant monument of antiquity. The sarcophagus known by the figures of weeping women was considered by the Professor to be also a work of the fourth century before our era. The work was eminently of an artistic as distinguished from a historical character, and was marked by some of the most admirable qualities of the Greek genius. There were pillars along the sides and ends of the sarcophagus and figures of eighteen women—"a dirge," as had been said, "in eighteen stanzas." All the figures were in different attitudes, and each had an

individuality of its own. But in all there breathed the same spirit of gentle diffused melancholy and they exhibited the self-restraint and charm which were discerned in the sepulchral reliefs at Athens. In another the characteristics were less distinctively Greek, and the interest was not merely decorative but historic, and involved various events in the life of a man, including that of a father's sending out his son into the world. Professor GARDNER came to the conclusion that the four sarcophagi were of the later kings of Sidon, and that of the mourning women might be, perhaps, ascribed to King STRATO, the friend of Athens. The sarcophagi suggest that if explorations were properly conducted in the same region they would be well rewarded, but there is not much advantage in such works falling into the possession of a race who cannot enjoy them nor will allow others to do so.

THE decision of the Académie des Beaux-Arts on last Saturday will not we trust lead to the eventual suppression of the Prix de Rome, but when a dangerous innovation is sanctioned who can tell to what it may lead? By the laws of the institution all candidates for the prize must be bachelors, and must remain so while they enjoy the privilege. The Académie de France in Rome is intended to be to all its students what old BOWYER declared Christ's Hospital should be for the home-sick COLERIDGE, father and mother, uncles and aunts, cousins, and a substitute for all relations, however tender. But one of the musical prizemen wished to take a wife and to settle down peaceably as an organist. After a long debate the Académie des Beaux-Arts has approved of the arrangement. Now that a precedent is established we may next hear of a painter, sculptor or architect soliciting permission to bring a spouse with him, and if womankind once enter the Villa Médicis the beginning of the end will be reached.

GOTHIC is not the only style which seems to be in danger of destruction in France. There could be no suspicion of Germanism about a building erected from the designs of an Italian architect in 1610, but a building of that class was doomed to demolition last week. We refer to the chapel of the Lycée in Rouen, which some of our readers may remember. The plans for it were prepared by MICHEL BOSIO, and evidently were inspired in part by some of the details of St. Peter's, Rome. The building stood on the site of the Hôtel de Maulevrier, and it is supposed the materials were derived from the Château-Gaillard. The members of the Municipal Council do not care much for chapels in any style, and accordingly they have decided that BOSIO's work must be supplanted by a new kitchen. Their order has to be approved by the Minister of Fine Arts, but of late years Ministers are ready to sacrifice anything so long as municipal authorities and voters are gratified.

IT seems remarkable that an artist who won the Prix de Rome as far back as 1839, who was for a long period director of the Academy in Rome, who has been a member of the Institut since 1874 and gained the highest honours at international exhibitions, should have waited until 1895 before he received the Médaille d'Honneur of the Salon. That has been the fate of M. HÉBERT, whose *Peasants of Cervaro* we illustrated some years ago. Throughout his life he has devoted his days and nights to art alone. He kept aloof from cliques, and in consequence men who were more remarkable for wire-pulling and other electioneering arts were preferred to him. In this year's Salon M. HÉBERT is represented by a characteristic work, *Le Sommeil de l'Enfant Jésus*; but it was the remembrance of his long and honourable career which influenced the voters. For M. HÉBERT 239 votes were recorded, while M. HENRI MARTIN, a young painter who is engaged in the decoration of the Hôtel de Ville, who was his principal opponent, attracted only forty-five. M. BARTHOLDI, who designed the immense figure of *Liberty Enlightening the World*, which does duty at the entrance to the harbour of New York, as well as some memorials of the war of 1870; deservedly obtained the Médaille d'Honneur for Sculpture. M. CHARLES BAUDE, a wood-engraver, gained the medal for engraving.



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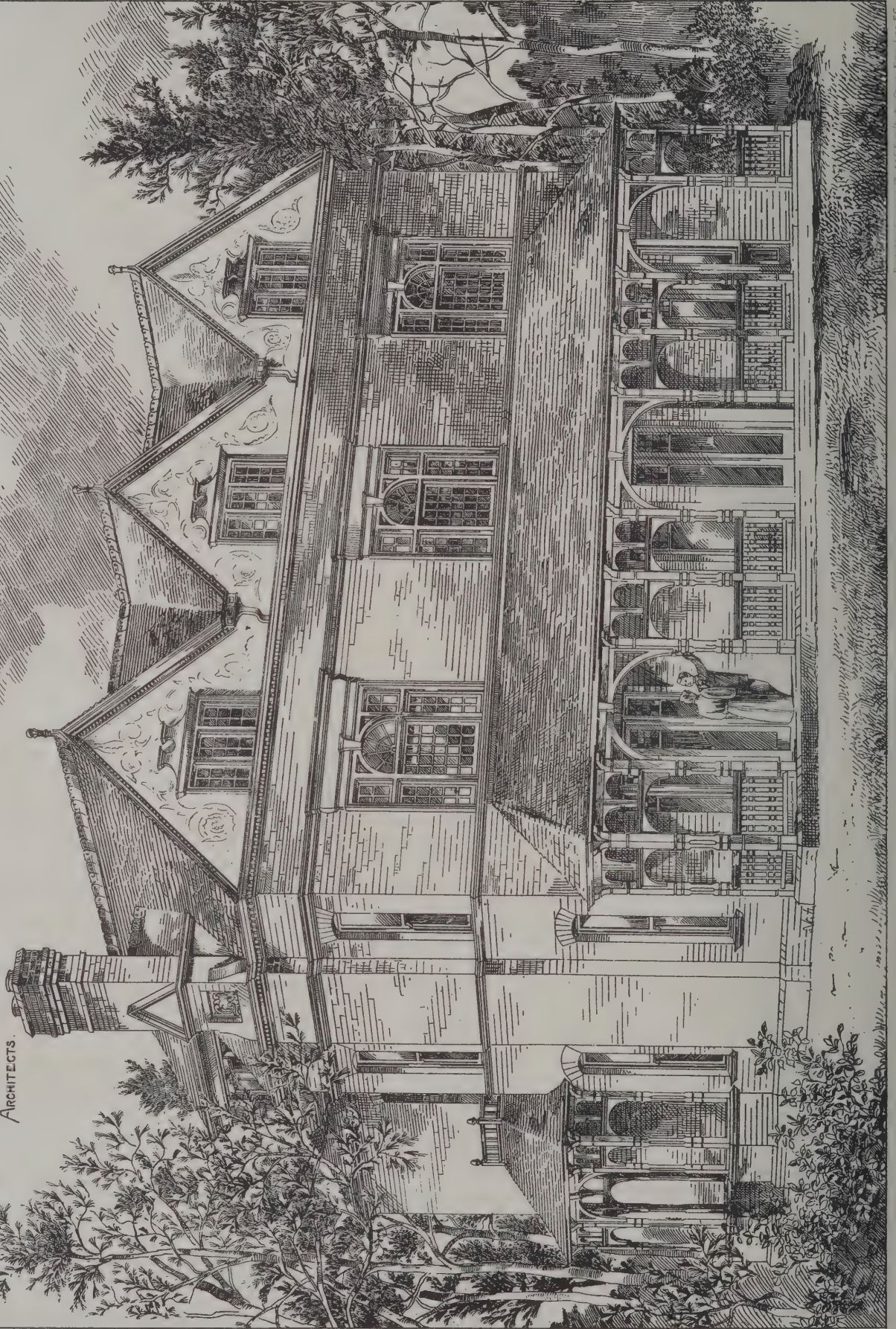


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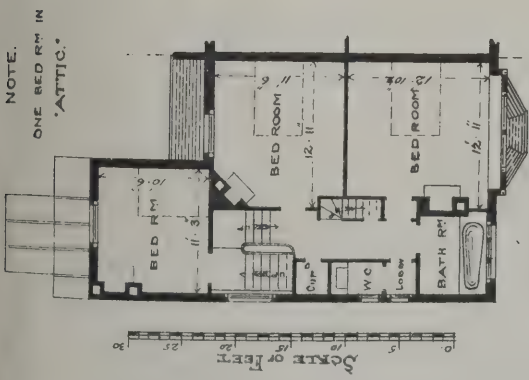
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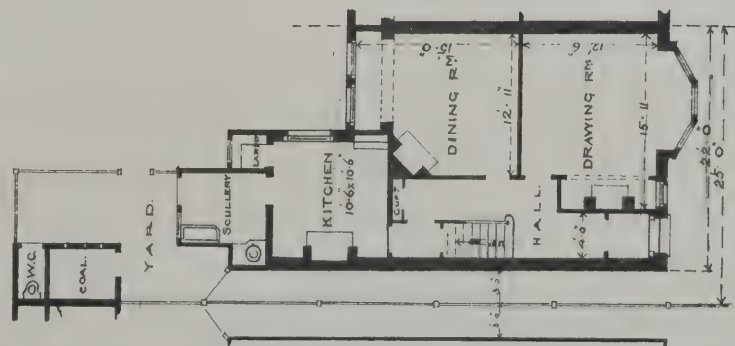


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PROPOSED COTTAGES, WEST BRIGHTON.
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FIRST FLOOR PLAN.



GROUND FLOOR PLAN.



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GRAND DINING ROOM: HOME AND COLONIAL MUSEUM
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PROPOSED COTTAGES, WEST BRIGHTON.

THE ARCHITECTURAL ASSOCIATION.

THE concluding meeting of the present session of the Association was held on Friday evening, Mr. E. W. Mountford, president, in the chair.

The annual dinner, it was announced, had been postponed till Friday, the 14th prox., to take place at the Holborn Restaurant, at 7 P.M.

Mr. A. C. Long and Mr. J. E. Colon were elected members. In connection with the soirée, a vote of thanks was passed to Mr. Earle and Mr. Sim and also to Lieutenant-Colonel Balfour and Captain Whyte.

House List for 1895-96.

The following were elected to serve for the ensuing session :—

President.—W. D. Caröe.

Vice-Presidents.—G. H. Fellowes-Prynne and F. T. W. Goldsmith.

Committee.—E. W. Mountford, A. B. Pite, F. G. F. Hooper, J. Begg, O. Fleming, W. H. Seth Smith, E. Woodthorpe, Theo. Moore, the Hon. A. McGarel Hogg and A. W. Earle.

Treasurer.—Hampton W. Pratt.

Librarian.—J. W. Stonhold.

Assistant Librarians.—C. H. Freeman and E. W. M. Wonnacott.

Secretaries.—B. F. Fletcher and A. H. Hart.

Auditors.—L. H. Sim and F. G. W. Bass.

Assistant Secretary and Registrar.—D. G. Driver.

Mr. WALTER CRANE read the following paper, entitled

Influence of Architectural Style on Design.

Mr. Crane said :—It seems tolerably obvious that without shelter of some kind, without walls or roof, without suitable materials, determined limits, proportions and prepared surfaces the art of the decorative designer, whether in sculpture or painting or any other method of expression, could not have much chance of serious development, historic continuity or permanent existence. The natural walls of cliffs and caves might be utilised certainly, as they have been in prehistoric times; bold tribal ensigns, such as the "White Horse," cut through the green turf on the chalk in a kind of natural sgraffito, as it appears upon the Wiltshire down, might exist (with periodic scouring) for ages; but it is only with the development of the constructive art that organic ornament springs to life; only with the squaring and joining of timbers, moulding of bricks and tiles, and the cutting and dressing of stone, and their use under the constructive necessities of a building, that the sense of relation or proportion is born, without which we could have no fine art at all.

It may be an open question whether the impressionist individual graphic sketcher or the constructive associated craftsman designer represented the primitive artistic condition. We are apt to colour history as well as art by the tint of our own sympathies; but, judging from the fragmentary sgraffito of the cave-men, it would almost seem as if the former were the first in the field, and that man only slowly found his way to the harmonious related and ornamental forms of art after he had made some progress in the construction of the primitive dwelling. It seems probable that from the material and method of construction of the wicker and wattled walls of the primitive hut were derived motives for some of the first types of pattern design. The primitive hunter-artist might scratch the forms of the reindeer and mammoth upon the bone handles of his weapons, or the herdsman-astronomer cut the signs of the sun and moon, of fire and water, upon clay or stone; but the sense of rhythm and harmonious recurring line would have to be learned in following the useful craft of the rush-plaiter and basket-maker, to whose simple constructive methods we owe at least two important plans of ornament—the checker and the spiral meandering line. Their value, too, has never been forgotten in ornamental work, and when man learned to work stone and bronze he still perpetuated these primitive motives.

In considering the bearing of the architectural influence upon decorative design of all kinds, which is so marked in all historic art, we may conveniently adopt Mr. Ruskin's three broad and main divisions, which indicate the fundamental differences of constructive principle in architecture, namely :—

1. The architecture of the lintel.
2. The architecture of the round arch.
3. The architecture of the pointed arch.

Or characterising them from the decorator's point of view by their leading ornamental spaces or features, we might distinguish them severally as :—

1. The architecture of the frieze and pediment.
2. The architecture of the spandrel and dome.
3. The architecture of the vault and window.

Of lintel architecture ancient Egypt gives us the most massive examples, but it seems most probable even here that stone construction only followed wood, or rather reeds and clay, and that the types and systems of ornamentation were originally suggested by those materials. If we look at the primitive Egyptian house, planned for a hot climate, built by the great riverside of materials furnished by the river itself, we may see the type of the massive Egyptian temple column (in the clustered reeds fixed at the angles); this but represents in stone, and more formally, a bundle of lotus reeds bound together by fillets of rushes, with the bud and flower clustered at the top to form the capital. The covered cornice of the flat mud roof made of rushes is perpetuated in the painted cornice of the pylons of the great temples, as at Edfu and Philæ. The mud wall built in layers filled in between the framework of reeds, with its horizontal and vertical divisions marked by them, may also have suggested the subdivisions of the stone wall to receive the hieroglyphics and figure-paintings; but with the adoption of stone structure came stone sculpture, and the temple walls are regarded as great surfaces for the permanent record of the mysteries of religion, of the powers and attributes of gods and kings, of their wars and conquests, and of the labours of the people upon which the wealth and power of empire always rest. The Egyptian wall reliefs were sunk, the outlines being hollowed and the edges of the figures rounded, so that they never projected in relief beyond the surface of the wall. We may consider this an elementary stage in the evolution of relief sculpture, but undoubtedly the broad and massive monumental look of the walls, which is so marked a feature of the Egyptian style, owes its character to this treatment. The statues have the same simple, broad, massive architectural character as if they were the half-emerged spirits of the changeless stone itself, placid of countenance and tranquilly indifferent to the passage of time; they impress us with their sublime dignity, which belongs alike to their sphinxes and lions which guard the portals as to the small portrait statue. Even where these latter show an extraordinary realism, as in the famous scribe of the Louvre, with the eyes of rock crystal, quartz and bronze—a work of the early empire—they are still under the influence of this architectural control, simplicity and reserve, which seem to me to give dignity to all Egyptian art. The Egyptians, though acquainted with the use of the round arch, did not use it as an architectural feature, like the Assyrians in their palace gateways, and who also, according to Viollet-le-Duc, used the round brick vault to support the roof of the interior large halls of these palaces; but the sculptor was the chief decorator in the Assyrian palace. He kept the door with his mighty winged bulls, man-headed, meeting at the angles, and facing outwards in a formidable way, their general design controlled by the rectangle of their position and architectural purpose, and he covered the alabaster wall slabs with delicately-chiselled reliefs, in which the story of his times and the customs of his country is graphically, if somewhat rigidly told.

The ancient Persian depended largely for his architectural effects upon lintel and column, the peculiar form of the typical capital suggesting its origin in the timber-built houses of the Medes, with forked tree stems supporting the beams of the roof. The wall decoration of glazed bricks from the ancient fortress and palace of Susa shows the Persians to have been accomplished workers in that material, and to have been early distinguished for their ornamental and colour sense. The frieze of archers moving in severe profile along the battlements of the fortress forms a striking decoration, and at the same time a remarkable illustration of the architectural influence, since the decoration not only shows this in its design, but could not have existed apart from the actual wall and its construction. The very joints of the bricks help the general effect and vary the surface. Design, colour and modelling are here one with structure. The figures appear to have been pressed upon the clay while soft from wooden moulds, and then divided into bricks, the bricks being long in proportion to thickness. The colour surface of the turquoise blue of the ground is very varied, being put on in small round flattened disc-like patches. The figures are alternate as to richness, patterns and colour, though alike in attitude. The small repeated device upon the coats of the alternate arches is supposed to represent the fortress of Susa itself in an heraldic sort of way. In the palm-leaf like running border, as in a similar design of frequent occurrence in Assyrian ornament, we see the type afterwards developed by the Greeks in the anthemion, who must have been largely at first under Asiatic influence. To the Greeks, too, we owe the simplest and most refined type of lintel architecture in the Doric temple, which was apparently evolved from a timber-built shrine or tabernacle, the triglyphs which divide the

external frieze into panels representing the ends of the cross beams. These, with the vertical grooves, serve as a framing for the sculpture, which, as in the Parthenon, filled the metopes or spaces between them. The low-pitched roof terminated in a pediment, and these pediments again afforded a space for sculpture. In the arrangement of the groups which filled the eastern and western pediments of the Parthenon, shattered as they are, with the assistance of Carrey's drawings, we may detect the controlling influence of architectural line. In fact, figure-sculpture intended to be placed in a pediment can only fill its position when it acknowledges this control, since the groups, however varied, must be enclosed by the rigid boundary of the space, running into extremely acute angles at each end.

The subjects were the contests of Athene and Poseidon for the patronage or protection of Athens, and both pediments were symbolical of all that the Athenian citizen held dear. In the eastern pediment we have the fragments of a great sculptural and decorative epic, the central point of the birth of Athena being lost, but in the figures and groups that remain I think it is clear how constantly in the controlling lines, both of groups like the Fates and in single figures like the Theseus, the long sloping angles of the pediment recur through infinite variation, and give harmony and relation to the whole work, from the extended arms of the sun-god rising in the extreme angle, driving his horses, whose heads emerge from the sea, to the descent of Selene, with the horses of night, in the corresponding angle.

We find here that great principle which holds good throughout all design—the principle of recurring or re-echoing line, which governs both the disposition of masses and the arrangement of detail. We may trace the indications of the same feeling in the design of the metopes and of the famous frieze of the cella, which is still more decidedly ornamental in its lines, and might almost have been planned upon those of a running rhythmical scroll border. There is, of course, in practice all the difference in the world between working consciously and dryly, according to fixed principles, and working inventively and freely under the influence of architectural geometric lines and spaces. To acknowledge the existence of natural laws in art is a very different thing to being a slave to an academic tradition, as in art there are generally a variety of ways of solving a particular problem.

It may be said, indeed, that however beautiful these sculptures are as individual figure-sculptures, and regarded solely as such, they are strictly architectural ornament and parts of a whole, and their distinction of style is, I venture to think, largely owing to that fact. The truth is that the human figure was really the ornament of the Greeks. Their types of strictly ornamental pattern in the ordinary sense were extremely limited and mostly derived from Asiatic prototypes, however refined upon and perfected by delicacy and precision of workmanship. But in all their productions in figure design they were free and inventive, and whether the aim of their artists was to produce a terra-cotta statuette, to paint a vase, to carve a marble statue or a frieze-slab, we find the same extraordinary feeling for grace and appropriateness and sense of controlling line. Another point we may note about these Parthenon sculptures, true of the use of sculpture in the Classical temple generally, is that they are not used to emphasise what I should call the constructive features, but to fill the interstices of the construction. The building stands without them; or I suppose few would be prepared to justify their presence in the British Museum if they were there at the cost of the fall of the Parthenon, though there are many who do so now, although they are there at the cost practically of its artistic destruction. That is to say, the building without its sculpture is somewhat like a man with his eyes put out.

Close by, however, we find an illustration of the opposite principle, the sculptural emphasis thrown upon the constructive necessities, in caryatid columns of the Erechtheum. In these we have a notable instance of the union of sculpture and construction, and it is evident that in the treatment of these figures the sculptor has strongly felt the necessity of architectural massiveness, simplicity, dignity and reserve. They each support the cornice upon an abacus and cap, and the columnar vertical feeling is expressed by their erect attitude, slightly varied individually by the severe vertical lines of their draperies. The caryatid idea is, no doubt, a most difficult one to treat satisfactorily, and there is a sort of painful slavish suggestion about it, as of human beings condemned to support an intolerable burden. It was said of the imitation of the Erechtheum caryatides at St. Pancras Church that they might be intended for St. Pancras householders groaning under the burden of heavy rates. There is no suggestion of restlessness or pain about the originals, however. The idea constantly recurs in Renaissance work, though without the Greek simplicity and reserve which alone makes it tolerable. The prototype of the sculptural pediment may, perhaps, be found in the sculptured slab placed to fill the hollow left by the relieving arch over the massive lintel gateways of the ancient cyclopean buildings in Greece, as at the gate of Mycenæ. In the sculptured lions and

column we have, too, a simple exemplification of the symmetric principle in design; as well as of that recurrence or re-echoing in the design of sculpture of the lines of the enclosing space.

The architectural influence is marked enough in the design of the accessories of Greek life, chairs and couches, lamps and pitchers. Forms and proportions varied not like later work, which in the Queen Anne period often followed in metal the proportion and details of the classical column.

The columnar idea is carried out in the bronze tripod standards used for lamps; it reappears in the supports of seats and chairs, and the figure frieze is used as a system of decoration for vases. With the use of the round arch other elements and principles were developed in decorative design. Under the Romans the capital, columns and cornice became more ornate in design, and this necessitated a more strictly ornamental treatment of the frieze, which became continuous and unbroken into panels by triglyphs. And the garland, or swag, as we term it, originally a temporary festive adornment, became a permanent decoration, valuable for its recurring graceful line, especially as adapted to the friezes of round temples and tombs—like the Sibyl's temple, and the tomb of Cecilia Metella; the vertical lines we see being obtained by the pendant ends and ox skulls, though the tradition of the ancient timber construction was still retained in the egg and tongue and dentil mouldings, which had long become purely decorative enrichments. The pilaster and cornice were also added to the architectural decorative resources, which were further enriched by the addition of such suggestive spaces for the painter and sculptor as the lunette, the spandrel and the medallion, while the decorative value of inscriptions was fully realised with the use of the dignified and severe forms of the Roman capital letters, re-echoing the vertical lines and angles of the architecture.

The fusion of Classical and Oriental feeling with Christian mysticism in Byzantine architecture, with which came in the use of the round vault and dome, opened a new field for that most splendid material, mosaic, which became *par excellence* the principal means as well as all the glory of the interior decoration of Byzantine buildings. In the churches of Ravenna and St. Mark's it dominates or takes the place of all other decoration, its impressiveness being largely due to this, and one feels it to be sufficient in itself. The concave surfaces of the vaulting afford a peculiarly appropriate field for the most effective use of the cubes of coloured and gilded glass, by means of which the designs are built up. The very method of mosaic work harmonises it at once with the craft of building, of which it becomes a part. It is a constructive method of surface decoration entirely in harmony with architectural construction, capable of the utmost splendour, and yet full of solemnity. The nature and conditions of the material seem to place natural limits upon its graphic or pictorial range, which, curiously enough, it appears to be in the nature of the degree of evolution of any art (or perhaps of artists) continually to attempt to overstep.

One has only to compare the decorative effect and architectural feeling of the Byzantine mosaics with the late Roman attempts to reproduce Renaissance pictures at St. Peter's to be convinced of its true artistic province and treatment, and to be left in no doubt as to which influence, that of architecture or of painting, has proved the most beneficial and inspiring to the mosaic designer and worker. We have in our own time in recent years returned to the old method of working glass mosaic as an architectural decoration, to working in on the surface, and *in situ*, as the only means of obtaining that richness and variety of surface and play of light impossible to be attained by the mechanical method of making flat slabs of tesserae on the back of the cartoon in the workshop.

The most important piece of modern mosaic work of our time and country is that upon which Mr. W. B. Richmond is now engaged at St. Paul's Cathedral. Personally I am not in favour of modern artists decorating a building of a former age—at least in the present condition of art and craftsmanship. I should put new wine into new bottles, and artistic interest in those places most bare of it. But I think, nevertheless, Mr. Richmond and his able assistants, the mosaic workers of Messrs. Powell, are carrying out a very fine, thoughtful and splendid piece of work, full of ability in design and conception and technical skill, governed by the architectural feeling of a decorator, even though that feeling may compel him to mask some of the characteristics of the building he is decorating—but then comes in the modern difficulty. From the mosaic point of view one might wish St. Paul's had been a Byzantine building. Notable characteristics in the design of Byzantine mosaic are the simplicity in the design and arrangement of masses. They are in some instances almost heraldic in their ornamental effect, and there is no doubt that the silhouette of figures or groups as thrown upon a gold ground is the most important consideration in the case of design intended to be seen from a long distance and in subdued or half light, and upon the concave surfaces of a dome.

As subsidiary to its chief decorative splendour in mosaic,

Byzantine sculpture shows a certain restraint, reserve and a linear feeling in its design, though with considerable richness of detail, as in the carving of the characteristic cushion and basket-like capitals and screen panels of open work, which also suggest wicker and ropework motives. This linear feeling and lattice, wicker and ropework motive can also be traced in the typical carved ornament of Romanesque work generally, as for instance in the mouldings of Norman arches and the caps of the shafts. These characteristics may perpetuate the tradition of the construction of the primitive buildings in this country of wood and wicker. In Norman ornament the use of recurring line and repetition of unit is very marked, and its peculiar character and richness is due to this. The zigzag moulding itself is an illustration of the principle, and simply repeats itself in varying proportions and projections. Some of the outer rings of Norman arches and arcading simply repeat the leading constructive form—the semicircle of the arch itself. This is still more observable when we come to the architecture of the Pointed arch and the gable, where the mouldings surrounding the window and door-heads repeat in projection the lines of the window and door in serving their original office of keeping the rain from the window and wall, richness of effect being gained by the variety of the alternating concavities and convexities of the section. Gothic work generally illustrates the opposite principle in the use of enrichment to that which we noticed in the Greek, inasmuch as the ornamental emphasis is generally thrown upon the constructive points themselves rather than on the interstices. We get the clustered and filleted shaft, the ornate foliated capital in endless variety; the richly-moulded arch, the cusped arch, the window tracery; the moulded ribs of the vaulting, their junctions marked by richly-carved bosses, and, if a corbel or bracket is used, the opportunity is seized by the sculptor for a head or a winged angel, but worked strictly in accordance with the size of joints of the stonework, and therefore always showing the controlling architectural influence. The exterior of a Gothic building is almost equally expressive of its construction; the buttress is made an important decorative feature and a source of variety and light and shade, often crowned with a pinnacle, and, in its flying form, supporting an apse, as at Wells, extremely elegant in design, moulded and pierced. The door and window heads are moulded; the spring of the roof is often marked by machicolations, and the parapet battlemented or pierced. The gables are crested, towers are pinnacled and spired, and tipped with vanes. This emphasis on the constructive features gives an expression of organic life, directness and strength which is characteristic of all Gothic design. Interstices are, of course, extensively used, as well as the tympanums of porch arches, and niches through these massed together and super-imposed and filled with figure sculpture, as in the west fronts of many cathedrals; they appear to be inseparable parts of the structure, and they aid in the lines and general feeling of their design and treatment the general structural effect, just as we have seen the sculpture of the Greek temple did, though in a different way.

Just when design was emerging from Byzantine tradition, or perhaps adding to it by fresh and simple inspiration from nature, and acquiring technical freedom, in the thirteenth century, Gothic sculpture appeared to reach a grace and vitality which relates it to the best Greek work. English Gothic sculpture has suffered so much from the destroyer and defacer that it is difficult to find a complete example to compare with continental work, the west front of Wells Cathedral being supposed the only important façade of Gothic architectural sculpture remaining in England, although there are many interesting and beautiful monuments and effigies, both early and late, scattered throughout the land, remarkable no less for their character and worth than for their ornamental beauty and architectural feeling. But perhaps we have nothing of quite so fine a quality as the French cathedrals show, such as the central pillar of the porch of Amiens, the figures from the west porch of Auxerre, nothing of that wonderful, delicate, pathetic beauty of the early Renaissance sculpture of Italy—such as the figure of Ilaria of Lucca displays. Although among the recumbent monumental effigies scattered about in the churches and cathedrals of our own land, there is plenty of fine work closely corresponding in feeling with the characteristics of the contemporary architectural design of the same dates, we get in the thirteenth century the recessed and richly-canopied tomb, as that of Gervase Allard at Winchelsea, where the design is part of the wall itself, and where architectural detail forms a large part of the interest, but yet appropriately leads up to and frames the dignified figure of the knight reposing beneath. The idea of the recessed tomb might possibly have been derived from the Mediæval bed recessed in the wall—the “shut bed” of Mr. Morris’s romances, the use of which still appears to linger in Brittany.

The shadow gained by the recess certainly gives solemnity and impressiveness to the sculptured effigy. The effigy is frequently sculptured upon an arcaded tomb, shields with the bearings of the family filling the panels between the arches, which are made to subserve by their more formal masses and

vertical lines the freer and more horizontal ones of the sculptured figure. Architectural design and sculpture are in these works inseparable. The later Gothic tombs take the form of shrines built clear from the wall and overhung with rich tabernacle work, buttressed, and sometimes enclosed with wrought-iron railings, in the design of which may again be seen the prevailing architectural influence of the time. (An example of the like from Wells Cathedral shows the buttress and battlement used ornamentally in the principal supports, the intermediate irons being hammered into finials of a fleur-de-llys form.) We find the same principle of the re-echoing of architectural detail and its adaptation to ironwork in later time, as in this bit of the altar rail at St. Thomas’s Church at Salisbury, where we get the form of the Elizabethan gable and volute cresting the principal standards, which below are treated as pilasters of open work. Even in the extremely free and fantastic ironwork, like that of the porch-gates of St. Laurence at Nuremberg, we may still see an acknowledgment of certain architectural and structural lines and limits. Or where, as in the free and flowing scroll of a hand-rail from a church at Rothenburg (for a sketch of which I am indebted to Mr. Spiers), it seems to escape from all structural trammels, we yet feel that the curves are designed with a view to fill the panel with an evenly dispersed grill of curves, and in strict, though not formal, relation to the square of the enclosing rails.

Not less instructive for the evidence they give of architectural influence are Mediæval brasses in the treatment of the figure, the enclosing borders and the use of inscriptions. More especially remarkable in design and draughtsmanship are the Flemish brasses of the Gothic period, where the full-length portraits of the personage or personages commemorated occupy the principal space in the panel, not cut out in silhouette and inlaid on the stone slab, as generally is English brasses, but relieved upon a rich diapered background. The ecclesiastical ones are often richly canopied, the borders full of smaller subjects, and resemble in arrangement and treatment the typical stained-glass canopied window of the fourteenth and fifteenth centuries. The broad vertical and simple treatment of the draperies is very marked, and the character drawing is often very fine. With the attempts to gain more surface qualities, with the use of greater complexity of shading lines, when, in short, what is commonly called the pictorial element comes in with a desire to escape from the architectural influence, design, ornamental effect and draughtsmanship all decline.

It is the same in other branches of design, such as stained-glass, which at its best shows such close relationship to the architecture of the building it enriches. With the evolution of the window from the small round-headed loopholes of the Byzantine, through the simple lancet-pointed lights separated by solid masonry to the foliated tracery and subdivided mullions of the later Gothic, the splendour of mosaic gave way to the splendour of the stained-glass window—at first a jewelled web of geometric lead thrown across the light; the form of the simple or cusped points of the tracery influencing the lead lines they enclosed, and the long vertical lines in the figures of saint and angel re-echoing the long lines of the narrow pointed light, into which ascended later the pinnacles of the canopies. Up to the end of the fifteenth century each light was still generally regarded as a separate panel, but with the large windows subdivided with light tracery and thin mullions it became feasible to consider the design as filling the whole window.

The next step was to consider it as a transparent picture, to represent architectural perspective, which in this direction was a form of architectural influence distinctly injurious to the beauty of glass. We may imagine that the stained-glass window represents a thin, flat, transparent screen (however varied by quality of colour), continuing the wall in another material and thus preserving the idea of shelter and seclusion we always want in a building. Anything which interferes with this feeling, or contradicts it in design, which shows an effort to escape from the necessary conditions of the material leads one astray. A kindred feeling determines the treatment of the wall, and perhaps nowhere is the necessary architectural influence more felt than in mural decoration. Anything which disturbs the general flatness and repose is out of keeping. We may gain a certain accidental or naturalistic interest, but at the cost of decorative repose and richness. The Italian fresco painters of the Early Renaissance from Giotto and his school, thoroughly understood this, and though in details naturalism was carried quite far, as in the beautiful frescoes in the Riccardi Chapel at Florence by Benozzo Gozzoli, in spite of all their richness and variety they remain essentially wall-paintings, as completely mural as the finest arras tapestry, such as those splendid Burgundian specimens at South Kensington, which, while absorbing much of the new splendour and detail of the early Renaissance, remain Gothic in spirit.

The great principle in the design of these tapestries as of early wall-painting was the exclusion of sky-spaces and atmospheric planes which necessarily, in proportion to the illusive design with which they are represented, must throw the wall out of the perpendicular. There is an instance of a sky- and

distance having been introduced later at South Kensington. We do not want to think we are out of doors while in a room, so that all successful mural decoration never forgets the wall—it acknowledges, in short, the architectural influence. The same principle is to be traced in other textile design, in the geometrically planned and heraldically treated silk hangings of Sicily, and the Venetian and Genoese velvets and brocades, with motives derived from Eastern sources, which would fall naturally into the lines of the offices they decorated, and which frequently repeat the geometric foliated forms of Arabic and Gothic architecture, as in the brocade from an Annunciation in Memliné. We see the value they are to the painters and designers in affording rich backgrounds of definite recurring masses of pattern, to oppose the varied outline and relief of their figures.

There remain still vast provinces in design we have not been able to traverse in our search for the architectural influence which, in times of living artistic traditions, closely associated arts and crafts, and an organic architectural style springing, as it were, from the very soil of the country was paramount throughout art. Furniture and woodwork, one might say, has an architecture of its own, pressing into its service painting, carving and metalwork, and has often been part of the building itself. In detail and enrichment furniture constantly re-echoes the detail and enrichment of the prevailing architectural style of its period, from the graceful lines of the classical couch, chair and lamp standard, which have reappeared in our own century, to the massive and simple oaken bench and trestle table of Mediæval times, or the richly carved and canopied seat. The arabesque panelled pilaster and classical cornice enrich Italian cabinets and coffer; the turned chair or table leg of the seventeenth century onwards constantly repeats in varying proportions the features of the quasi-classical column; the broken pediment surmounts the Chippendale bookcase, while Greek refinement of line and feeling for delicate carved surfaces reappears in English chairbacks of the same period, and excesses of the later French Renaissance break out in the curly legs and dissipated scrollwork of current trade furniture.

Historic costume, too, has the strictest relation to architectural style, from the simple and constantly varied folds of classical tunic and toga, the hood and peaked head-gear, and heavy vertical folds and figured stuffs of Mediæval times, from the periwig and long-skirted coat, to our own day, when, "in spite of all temptations," the chimney-pot hat remains in strict architectural relation to the chief architectural feature of our cities.

In jewellery, metal-work, pottery, inlays, in the spacing of the book-cover, the distribution of its tooling, in the arrangement of the book page and its decoration, in the form of choice type—everywhere in beautiful art we may find the architectural influence, that poetry of the constructive sense which is the common sense of art, and adapts itself to all manner of useful things, giving to each its particular and ornamental value, and insuring it harmonious place and relationship in the great household of design.

I believe that in any period or country where exists anything like a distinct and living architectural style we shall find its influences coming out in all sorts of ways, harmonising and controlling invention, and bringing all the arts of design—which really owe their existence to architecture—into relation with itself. In countries like Japan, which (perhaps owing to its liability to constant earthquakes) have no stable or noble monumental type of architecture, it is noticeable, in spite of extraordinary artistic skill, there is a tendency towards triviality in the design of accessories, but even here it is noticeable how the form of their main constructive material—the bamboo—constantly reappears as an element in design.

It is curious to trace the lingering survivals of architectural relation still clinging about such unrelated art, as much modern sculpture (or statuary) and easel painting—I mean in the pedestal—as essential to the one as the frame moulding is to the other. Both sculpture and painting have set up a supposed independent existence—have gained, perhaps, a decree of judicial separation from architecture, if not a decree *visi*. But it has only been for the sake of convenience and to meet certain commercial conditions, and thereby it becomes a grave question with artists, with all who care for beauty and harmony in art and life, how far a unified art is possible under the rule of the huckster and the speculator.

It is certain in any case we shall never be able to build up a noble style in architecture and bring about a harmonious unity in all the arts of design without sympathy and co-operation, without some mutual understanding of each other's work and aims on the part of artists, whether their work is constructive or graphic; but I think of late years there are not wanting signs of a strong and growing feeling in this direction which is beginning to tell upon contemporary work.

At the conclusion of the paper, Mr. H. H. Statham proposed a vote of thanks, which was seconded by Mr. R. Phené Spiers, F.S.A., and supported by Mr. A. B. Pite and Mr. Hooper, to Mr. Crane, who replied, and the meeting adjourned or the recess.

DURHAM CATHEDRAL.

THE following report of the address on the history and architecture of Durham Cathedral, by the Rev. Dr. Greenwell, delivered at a meeting of northern archaeologists in the building, is taken from the *Durham Advertiser*.

The President at the outset remarked that he did not intend to say anything about the ecclesiastical portion of the history of the church of Durham, but intended to entirely confine himself to the facts connected with the dates to which the several parts of the buildings were attributed. Those dates, although not many, constituted, he thought, a perfect history with regard to the whole building. There were very few cathedral buildings in England with regard to which they had got so many ascertained dates, but in Durham they could fix the precise date of every part of the church. Durham was, as compared with York, Chester, Lincoln and those cities which were in existence before the Roman Conquest, of comparatively late time. He mentioned this in order that they might not get into their minds, although sitting in a very ancient building, that it represented a very ancient site. That there was some Roman occupation here might, he thought, be regarded as almost certain. In the cathedral churchyard a Roman altar was found, and a few Roman coins had been found on the other side of the river. In the tower of St. Oswald's Church the remains of a pre-Conquest cross were found. He did not understand how that could have got into the tower—it was simply used there as a building-stone—unless it had been found more or less near the site of the church, and he thought that pointed to there having been before the Conquest not only some settlement on the opposite bank of the river, but also that there was a church there with its accompanying cemetery. All this, however, did not imply that there was any great Roman settlement, such as at Lancaster and Chester-le-Street, but there was a Roman occupation, probably of a trifling nature. When they spoke of Durham they must go back to the parent of Durham, Lindisfarne, for without Lindisfarne there would have been no Durham. Dr. Greenwell then referred to the introduction of Christianity into the North of England from Lindisfarne, of the invasion of England by the Norsemen, in consequence of which the ecclesiastical foundation was obliged to leave Lindisfarne. They came to Chester-le-Street no doubt on account of the latter being a Roman settlement, and where they probably thought they would be afforded sufficient shelter against succeeding incursions of their enemies. They, however, found Chester-le-Street not sufficiently strong, and commenced a series of wanderings, ultimately settling at Durham in 995. Before that the plateau on which the cathedral stood was unoccupied, there being, they were told, merely a little cultivation upon the centre of it. Well, in 995 the bishop brought here the congregation of St. Cuthbert, a number of ecclesiastics to whom was entrusted the body of the great St. Cuthbert, and it was to the various offerings and donations and gifts made to the saint that the church of Durham owed its wealth. Aldhun at once commenced to build a church which was finished in 999.

Aldhun's Church.

The chronicler of the church spoke of it as a much smaller and less important building than the present church. How large Aldhun's Church was and where situated they could not tell, but no doubt it occupied a portion of the great area upon which the present church stood. He (the President) thought it occupied more or less of the nave, and by careful and systematic excavations it was quite possible that the whole of the ground plan of the old church by Aldhun might be laid bare. No one knew what the pick and the spade might reveal. The pick and spade were in every way the most valuable aids to history. He had had a great deal to do with these useful tools, and knew what controversies they had set at rest, and how many speculations had been shown to be without any basis at all. The Norman Conquest exercised a great influence over England, and the first Bishop of Durham after that was Walcher, who was put to death at Gateshead, probably owing to a racial rising there. This put a stop to the alterations the bishop had intended to have made in the church at Durham. There were, he believed, some remains of Walcher's buildings still in existence to the south of the present chapter-house. The whole character of the walling referred to looked more like pre-Conquest walling than the better work introduced after the Conquest, and was no doubt done by native workpeople. Now came the great bishop to whom the present cathedral church of Durham was due, William St. Carleph, brought up as a monk in a Benedictine monastery. He came to Durham in 1081, and found a society of ecclesiastics extremely repugnant to his notions. Carleph had naturally a strong prejudice against married clergy, and determined to dispossess them. They were given the offer to remain under the new system and to become monks in the newly-established monastery, but they naturally preferred to go away with their wives and families, and were established by Carleph at various

such as Norton, Auckland and Darlington, where they allowed maintenance for the remainder of their lives. This great bishop established the Benedictine monastery of Durham and went into exile in 1089 and remained until 1092. During the time of Carileph's exile the refectory was built, the lower part of which still remained in the very remarkable crypt, which extended under the whole length of the old refectory—now a portion of the library; and besides that, another crypt contained within the Deanery, and forming part of the cellars of it.

William St. Carileph's Church.

Carileph returned from exile, and in 1093 determined to build a new church of larger dimensions, of more magnificent construction, and altogether one more worthy of the great monastic house which he had established here. Thus on August 11, 1093, the foundation-stones were laid. A great question had been raised as to what was done with Aldhun's Church. Simeon stated that Carileph gave orders to have Aldhun's Church destroyed before he commenced to build his church. A contemporary writer stated that before the church of Carileph was built he had destroyed Aldhun's Church. That, the President thought, must be taken with a great number of grains. At that time they had in the monastery the full complement of monks, with a full staff of officials, all ruled over by the Prior. There would be the full number of services going on, and where could they be held but in Aldhun's Church? His opinion was that until Carileph's Church was so far completed these services were held in Aldhun's Church, and then at a time when the new church had reached a certain stage, and capable of affording accommodation for the holding of the requisite services, the old church was taken down. That he put forward as a reasonable speculation. Carileph, as he had said, laid the foundations of his new church in August, 1093, and how far he carried on the work it was perhaps not possible to say, but they were told by the chronicler that when Flambard, the next bishop, came to the throne, he found the church finished up to the nave. Mr. Hodges would point out to them subsequently the point in the nave to which the church had been built when Flambard came. The church was finished by Carileph to those great arches which supported the tower, and a certain part of the tower above. Not the whole of the existing tower. The arches on the north and south sides and the two arches on the west side must necessarily have also been finished, for they could not have put piers like those they saw without having them buttressed. They were told by the chronicler that the monks neglected the compact made between the bishop and themselves, that they were to construct the monastic buildings, and that in the interval between the death of Carileph and the succession of Flambard they went on with the church. The part he thought the monks built during the interval was the west side of the transept, and probably the roof of the north transept. Flambard, they were told, had at his death finished the nave up to the groining. Therefore he must have finished the whole of the nave. It was not built at the time of his accession to the throne and he built it up as far as the vaulting. Hence at the death of Flambard in 1128 they had practically the whole of the cathedral finished, with the exception of the roof of the nave.

He would not go into the question with regard to the aisles as to how far the church was finished by Carileph. He had his own view upon it, which was that Carileph's work comprised the whole of the outer wall of the church as high as the top of the arcade—that he enclosed the whole area of the church. Much had been said from time to time with regard to the roof of the choir. Unquestionably the great architect who planned the church of Durham intended from the first that there should be a stone groining over the choir. It was a very early example, and that any builder should attempt to put on a groining over a church of such large dimensions at so early a period has given rise to great doubts in the minds of many architects. They stated that no church of the magnitude of Durham and built at that period appeared with a stone groining, and therefore it was almost impossible to believe that the groining was put on at the time. His answer was that it was all very well to say that there was no building existing so large as Durham which had a groining on at so early a period, but why should not Durham be the first? He wanted to glorify Durham, and was perfectly justified in glorifying it to the highest extent. It was a building not only of great magnitude, but a building showing the most wonderful skill of the man who planned it. He who planned the church of Durham was an architect of the very highest capability. No Norman building could be mentioned along with it. The grand design due to Carileph's architect was one unrivalled in Norman work, and he (the President) had no hesitation in saying that had the man who planned this church lived at any other time, in the time of the highest period of Greek architecture or Mediaeval architecture, they would have had a building as unrivalled in its style as the present church was unrivalled in the Norman style. Therefore

when they had a man of such high capacity and great knowledge as the builder of that church must have been, why should he not have put on a groining, although no groined roof had been put on elsewhere up to that time? There was no reason whatever, and he maintained that the architect of Durham projected and put on the Norman groined roof over the choir. But they had got historic evidence for that assertion. In the year 1104, during the time the church was being built under Carileph, the shrine of St. Cuthbert had been transferred to a temporary building in the cloisters, and which building remained until the time of the Reformation. One of the first deans after the Reformation very foolishly destroyed it. It would have been extremely interesting had that little building remained standing in which the shrine rested until, as history told them, the church was so far completed that the shrine could be moved to the place prepared for it. A very interesting account was given of all that occurred when the shrine was translated to Carileph's Church—a full and elaborate account of the appearance of the body and of the coffin in which it was enclosed. The chronicler told them that the work was so far completed that the shrine could be transferred to its new place in the choir, but those entrusted with the task found very great difficulty on account of the woodwork which supported the roof at the place. They did not know how to get that woodwork down lest any great damage might be occasioned thereby. Now, the woodwork which was said to have supported the roof must have been the centreing of the span of the groined roof. Had it been an ordinary roof of wood there would have been no occasion to remove any wood that supported it. Therefore when the chronicler talked about the great mass of woodwork supporting the roof which had to be removed, there was no doubt it was the centreing of the groined roof. Well, St. Cuthbert came to the aid of his people, and the next morning the prior, to his intense astonishment and delight, found that the woodwork had been taken down, laid upon the floor of the church, and that without anything whatever having been damaged. Having further referred to the great difficulty of putting on the groined roof at that portion of the choir designed to receive the shrine, and the great mass of wood necessary to accomplish it, Dr. Greenwell went on to say that they might come to the conclusion that in the year 1104 the choir of the church was finished so far that a stone groined roof was put upon it.

The Roof of the Nave.

With regard to the nave, he had already told them that at the death of Flambard the latter had finished the nave up to the groining; therefore the only portion of the church which required completion was the roof of the nave. Now it had been asserted, and was still asserted by many, that the roof of the nave was a thirteenth-century roof. This seemed to him to be utterly opposed to all knowledge of architecture. Such an assertion was perfectly incomprehensible. The roof bore the most unmistakable evidence of belonging to the early part of the twelfth century. But here again they had historical evidence. They were told by the chronicler that in the interval between the death of Flambard and the accession of Galfird Rufus in 1133, the monks completed the nave. Now there was nothing to do in the nave but to put the roof on, and therefore he thought they might fairly say without doubt that the roof under which they were sitting was built in the interval between the death of Flambard and the coming in of Rufus in 1133. The roof bore evidence which architecture could point to to show it was of that date. They had thus practically got the whole of the church finished as it was originally intended to be.

The Chapter-house.

So far as they knew Rufus did nothing in the church itself, but in his time—between 1133 and 1140—the chapter-house was completed. They were not told that the chapter-house was commenced by Rufus, in fact he thought there was reliable evidence in the architecture that it belonged to two quite different periods. One part of it, the arcade, which ran round the whole of the chapter-house, was of an earlier period. He should think it not improbable that it was commenced by Flambard, for they were told that not only did Flambard go on with the church, but also did something towards the other buildings connected with the church. They might therefore say that the chapter-house was commenced by Flambard and finished by Rufus, because the roof and west wall, together with the mouldings and a very beautiful doorway still existing all bore very evident signs of being of the date of Rufus. Besides, in the doorway of the chapter-house there appeared the badge of Stephen, who reigned during the time Rufus occupied the see of Durham. The chapter-house, as they knew, was unfortunately almost entirely destroyed in 1796, under the advice of Wyatt—a very stupid and wicked thing to do, more especially when they considered that there was no reason whatever for it. The chapter-house was now being restored to its former size in memory of the late Bishop Lightfoot, and on June 13 next would be handed over by the restoration committee to the chapter.

Bishop Pudsey's Work.

They next come to a very great builder, Bishop Pudsey, who occupied the throne of Durham from 1152 to 1195. During the reign of Pudsey architecture was altering and making very rapid strides indeed. Pudsey intended to erect no doubt what was a lady chapel at the east end of the church, and there was a traditional story that St. Cuthbert would not allow Pudsey to build a lady chapel so near to where his own bones rested, and caused great fissures in the walls. Pudsey never completed the building at the east end. Another story had it that Cuthbert appeared to Pudsey and told him that he could build a chapel anywhere else, and Pudsey acting on that advice built the Galilee chapel at the west end, which still remained, a beautiful specimen of the transitional work of about the year 1180. Pudsey also built many churches and had two architects, Roger and William, who were called engineers. They were men of very high artistic feeling and erected most beautiful and charming buildings, but they did not possess that engineering skill which the great architect of Carileph possessed. The buildings designed and erected by Roger and William were unfortunately not constructed with a due regard to the engineering part of the work, and all soon showed signs of shrinking. As regards the Galilee, they did not know what its foundations were, but in its erection so little regard was paid to its construction in regard to the thrust of the arches that it bulged out towards the west, and it was only in the time of Cardinal Langley that that was stopped by the erection of enormously strong buttresses against the west end. The Galilee was without doubt one of the most exquisite and beautiful buildings of its time in the country. They now returned to the east end of Carileph's Church, the foundations and upper structure of which had been disclosed by the recent excavations. They knew from an appeal made by Prior Melsonby, in the early part of the thirteenth century, that in the time of Pudsey there were undoubted signs of shrinkage, and that the east end was in a very insecure state. Probably Pudsey had intended to rectify that by building a chapel at the east end, but he (the president) was afraid that owing to the imperfections of Pudsey's architects he would not have been able to do so. The condition of the east end became so bad that steps were taken by Bishop Poore, translated from Salisbury, to take down the east end and replace it.

The Nine Altars.

Poore collected the money for the work, but died before he had time to commence, and it was not until 1242 that his successor, Bishop Farnham, and Prior Melsonby, commenced the present exquisite thirteenth building, known as the Nine Altars. It possessed a very strong resemblance to the Nine Altars at Fountains, erected about the same time. Durham was a finer building; in fact, he did not think that a finer building of that period was to be found anywhere in England. Fortunately the name of the architect of the Nine Altars was preserved. It was very rare indeed that an architect of old times had left any record of his own name. He was satisfied to leave the magnificent buildings themselves to testify to his memory. This showed how modest and unassuming they were, very different to many persons of the present day, who were far too fond of parading themselves. If any person of the present time were to put up a building like the Cathedral Church of Durham, he would take good care that he should be known to the world for all time; but not so these great masters of the past. However, the name of the architect of the Nine Altars was preserved, and it was discovered by a mere accident. Many years ago, when making a catalogue of the seals, of which the dean and chapter possessed an unrivalled collection, he (the president) took up a deed, which attracted his attention. In such documents the Nine Altars was always referred to as the *Nova fabrica*, and in this conveyance in the chapter library there appeared as a witness the name of *Magister Ricardus de Farinham, tunc architector novae fabricae Dunelm.* In the arcade there was a number of heads of bishops, kings and queens, but there was also a head which was undoubtedly a portrait, with a close-fitting cap, similar to those in which architects of that period worked. This he believed to be a portrait of Farnham, the architect of the Nine Altars, and a very characteristic and striking portrait it was. The Nine Altars was commenced in 1242, and, judging from the date of the last indulgence granted in connection with the new work, it was probably not finished before the year 1280.

The Neville screen was a very beautiful piece of work, now despoiled of the numberless figures which at one time filled the niches, and added greatly to its beauty. It was proposed a few years ago to replace these figures, and he was very glad that that was not done, because, in the first place, he did not think it right to interfere with the work of a great artist. A great artist planned that screen and designed figures for it, and for somebody else to insert other figures seemed an unwarrantable interference. Besides that he did not think any man of the

present day was sufficiently skilful to work upon medieval lines. One of the designs submitted for filling the niches was utterly ludicrous. A little better one was projected, but fortunately not carried out, and the screen remained as they now saw it. The screen was commenced in 1372 and finished about 1380, and was called after John Lord Neville of Raby, who bore a considerable portion of the cost.

Bishop Hatfield, who reigned from 1345 to 1381, built the tomb and bishop's throne during his lifetime. It was a very remarkable throne, and for size and magnificence no other bishop's throne could be mentioned with it. It was the throne of the bishop in his palatinate probably, and not in his episcopal capacity. The former position fully justified Hatfield in erecting such a fine example of the work of that period. Having referred to the terrible destruction that had gone on in comparatively late years by taking out the old windows and putting in new ones, the president alluded to the additions made by Cardinal Langley to the Galilee. Not only did he strongly buttress the west end to secure the building, but he also erected two additional shafts and put on a new roof. The finding of the original bills had destroyed the belief that the added shafts in the Galilee were put up by the original architect. They were added by Langley, as proved by the bill for the stone, which was obtained from a quarry on the Browney. The centre tower, originally Norman, was twice burnt down, in the thirteenth and fifteenth centuries. In 1455 it was in so ruinous a condition that an appeal was made by the then prior for money, because he said it was actually coming down. Therefore that part of the tower above the arches was later than the year 1455, and was due to the appeal then made. That completed the church.

The Cloisters.

The cloisters, although terribly mangled and mauled now, still possessed to a certain extent very ancient characteristics. They were commenced in the time of Bishop Skirlaw, and were completed by Langley in 1418. The kitchen was commenced in the year 1368. It was now in its entirety and was a very fine specimen. There was no kitchen equal to it except the great kitchen at Glastonbury. The dormitory was finished in 1404, and to a large extent remained in the state in which it was built. It had a grand massive solid oak beam roof. They would scarcely believe it, but it was quite possible to believe anything, more particularly of deans and chapters. Well, the dean and chapter, when they fitted up the room for a library not so many years ago, actually proposed to take the fine old roof off and replace it, with what? A pitch-pine roof. It was really almost incredible that such a proposition could have been made, but it was made, and the roof was only saved by the strong representations of Mr. Hardwick, the architect, a man of high reputation and large means, and whom the dean and chapter were obliged to listen to. Mr. Hardwick said:—"I will not only not do the work, but I will make known throughout the whole of England the deplorable piece of destruction you are going to perpetrate." Fortunately the roof remained to the present day, and was one of the most massive and finest roofs they could possibly see anywhere.

An Architect's Theory.

Mr. Hodges, of Hexham, described the cathedral from an architectural point of view. He said, living at the end of the nineteenth century, when they were used to the erection of buildings cheaply and rapidly, it was difficult for any person to grasp in his mind the conditions of life, and the state of architecture and building construction when Durham Cathedral was erected 800 years ago. The only thing they saw now, as the monks saw it, was the massive line of the Norman architecture, which was absolutely of permanent duration. Mr. Hodges then proceeded to speak of the state of architecture in England when Aldhune's Church was built. The position of this church was probably the nave of the present church. Carileph began his church on a most ambitious scale in 1093, but was doubtless hampered by the peculiarities of the site. The proportions of the church were absolutely perfect, but the nave was a little short for a Norman nave of that period. This was doubtless due to the exigencies of the site. The plan of Carileph's church was laid down utterly regardless of cost. At the east end Carileph would have to go down from 20 feet to 22 feet to put in solid foundations to support his church. The plan consisted of a long nave, transept and choir, ending in three apses. There was an apsidal end to each of the aisles, and an apsidal end to the choir itself. It was a normal plan of a Norman church of that period. A large number of churches were built on this plan in England and Normandy; but in England not a single one remained unaltered, and in France only four remained. Of churches in England, with solid apses to the ends of the aisles and square outside, only two other examples, besides that of Durham, remained, namely, Peterborough and St. Alban's. It was customary and convenient to have apses at that period behind the altar, and they were adopted generally. Durham was a rare

case where the original design was carried out within a reasonable period, and this was only done by the great wealth of the church and the determination of one bishop after another that the cathedral should be built. He thought this arose from a great admiration for Carleph's design. Thus Durham was the only complete Norman cathedral in England; in fact, there was no exaggeration in saying it was the finest specimen of Norman architecture in the whole world. Mr. Hodges then went minutely into his subject, explained the necessity for erecting that most beautiful specimen of Gothic architecture in the world, the Nine Altars (namely, to afford accommodation to the pilgrims visiting the shrine of St. Cuthbert, and to provide chantries), and in the course of his address said the design of Carleph's church was not only one of great ambition and of great magnitude, but one of great harmony—one of those designs in architecture which the longer they looked at it the more pleased they became with it, and the more thoroughly satisfied that everything was right about it, and everything in proportion.

After visiting the site of the recent excavations, those in attendance proceeded to the chapter-house.

Mr. Hodges said that in the Middle Ages there were practically two orders of clergy, called the regular and secular clergy, and each had a chapter-house attached to their church. There were two distinct forms of chapter-houses. The monks adopted the square form with column and vaulting, dividing it into so many compartments. The seculars, in a general way, adopted the octagonal form. At Durham they had a form not at all uncommon with an apsidal east end, and which in its original condition was the finest example of that form remaining in England. It was built from 1130 to 1148, in the time of Galfrid Rufus, and was complete with its vaulting. It survived throughout the whole of the Mediæval period down to 1795, when by order of the then Dean and Chapter the eastern end was taken down. They built a wall across the western end, made a flat roof, stoothed and plastered the walls, and laid a boarded floor, and for what? To make a comfortable room. That was the condition of the chapter-house until four years ago, when it was decided to rebuild it as a memorial to the late Bishop Lightfoot. Of course it was a matter of opinion as to the desirability of reproducing a thing which had been destroyed. Some people might hold one view, others another, but he thought there could be only one uniform opinion by unprejudiced persons, namely, that when an attempt was made to reproduce anything which had been destroyed it ought to be done honestly. He was sorry to say that the chapter-house had not been honestly reproduced. It was neither the Norman chapter-house left by the monks, nor the chapter-house destroyed by the canons in the last century, nor was it the chapter-house left to our times. It was neither one thing nor another—neither fish nor flesh nor good red herring. It was in a general way a hash. Mr. Hodges then went into detail respecting the windows in the old chapter-house, and proceeding, said he thought the Dean and Chapter ought to have taken care that the chapter-house was reproduced in a proper manner. It had been for a very long time in hand, and had cost a very enormous sum of money, more than it ought to have cost. It was not for him to go into the reasons, but he thought as members of the ordinary English public they ought to have demanded that the chapter-house was reproduced according to the Norman design. When they came to the vaulting of the apse, which was the crowning feature of the old chapter-house, he was sorry to tell them that the vaulting had been made a complete mess of. If they went into the chapter library they would see two water-colour drawings made by old John Carter, a great and accurate draughtsman of last century. Carter gave two views of the vaulting, and they agreed exactly with the original plan. Mr. Hodges gave a technical description of the original vaulting. The original was a very nice vaulting, which did not look out of proportion or inharmonious. The present vaulting was all wrong; it was ugly in itself, and had an offensive appearance. Altogether the whole effect of the building was entirely spoilt by that bungle. How the thing could have occurred it was difficult to understand, and he hoped every person who spoke of the chapter-house would not hesitate to say what a mess had been made about the vaulting of it.

"A Member of the Chapter" writes to the *Durham Advertiser*:—We understand that the objections Mr. Hodges made referred to the vaulting at the east end of the chapter-house. The chapter architect has followed the usual Norman rule for vaulting, not following Carter's drawings, which give a form of vaulting unknown elsewhere in Norman architecture. The keystone of the old vaulting, subsequently found, corroborates the truth of Carter's drawings, but had the chapter architect followed it in defiance of the usual rules of Norman building, other objections could have been made as to the way in which the groining would have cut across certain capitals in a form not square to them. But these are matters of detail which architects must settle amongst themselves.

Mr. Hodges's reply was as follows:—I feel it is incumbent

upon me to reply to the note by "A Member of the Chapter" appended to your report of my remarks in the chapter-house on the 9th inst. I may divide the reasons given in that note for the way the vaulting at the east end has been carried out into three, viz:—

1. That "the usual Norman rule for vaulting" has been followed.

2. That the vaulting as it actually was was "unknown elsewhere in Norman architecture."

3. That had the vault been reproduced as it was before, the ribs would not have taken lines square with the capitals or corbels from which they sprang.

Your correspondent admits that the original keystone proves that Carter's drawings are right, and it follows therefore that the vault in the apse as executed is wrong.

The first statement is based on a false assumption, viz, that there was a rule for the vaulting of apses in Norman times which was universal. Anyone who knows anything of the architecture of the Middle Ages knows that by far the greater part of the Norman churches as originally built, both in England and France, or wherever the various phases of the Romanesque style were in use, were either subsequently altered or superseded or totally destroyed. It follows, therefore, that we know nothing of the nature of the vaults in nine-tenths of them, or thereabouts, probably a greater proportion. A rule, or rather an assumed rule, based on such insufficient data is of course valueless.

Secondly, that the vault, as we know it was, "was unknown in Norman architecture." If we admit this or rather admit that it was unknown, except in the case of Durham chapter-house, is that any reason why it should not have been reproduced as it was, when what it was was clearly known?

The fact is, the vault was a Late Norman vault, as late as 1140, and it was on the lines of the vaults of apses adopted by the builders of the succeeding century, as in the apse of Westminster Abbey. Herein lay its value. It may have been the first vault of the kind erected in England on these lines, and if so was especially interesting, and shows, as other things show, that Durham was in advance of many other places in its architecture.

The third reason given, that the ribs would not have sprung squarely from the corbels in the apse had the vault been reproduced as it was, is an equally unsound one.

It is only necessary to look into the cathedral to see that the whole of the diagonal ribs in the nave, transepts and aisles spring at various angles to their capitals or corbels. If vaulting ribs had always to spring squarely to the line of support there would be very little vaulting anywhere. Ribs spring at all angles, and are not considered eyesores in any sense. The slight skew of the line of the ribs in the chapter-house apse would never be noticed.

To sum up, we find the position thus:—A vault had to be reproduced, the form of which was known from two views and a plan, which showed that it was an excellent form of vault for its position, and was certainly an improvement on an assumed general earlier form, though that that form was general, or was earlier, was by no means certain. It is, however, certain that it is inferior. But why should not the vault have been reproduced as it was before? There was no doubt about it, and it was generally understood that the chapter-house was to be, when rebuilt, an exact replica of the original one as far as all the Norman work went, and why such an excellent and valuable example of a vault over an apse as was known to have been there was changed into the manifestly inferior form is a question which must necessarily occupy the minds of all people of taste and knowledge.

It is quite clear that the very foolish reasons given in the note referred to do not answer this question in the least degree.

LEEDS THORESBY SOCIETY.

THE Leeds Thoresby Society made one of their periodical excursions on Saturday afternoon for the purpose of investigating Esholt Old Hall and Esholt Priory, near Apperley Bridge, together with the old hall in Calverley village and Calverley Church. On arriving at Guiseley, says the *Leeds Mercury*, the party were met by Mr. S. Margerison, who acted the part of a most efficient cicerone throughout the expedition. Two waggons were in waiting, which conveyed the members straight to Esholt Old Hall, the first place of interest to be explored, passing through the beautiful Esholt Springs, so-called from the spring wood that grows there in great profusion. Boggard House was also sighted. This is popularly supposed to be haunted by a ghost of a somewhat original character, seeing that its invariable custom is to invite all comers to "laike at taws!" Esholt Old Hall, with West Esholt, is a separate manor from East Esholt, where Esholt Hall proper is situated, the residence of the Stansfield family. Formerly both estates belonged to the Wards of Guiseley, but

at a somewhat uncertain period the Old Hall portion was separated, possibly through marriage, and when the part now known as Esholt Priory became a nunnery, the Old Hall remained in the hands of the Wards until a few generations later. The Shireburnes, of Stonyhurst, then came to own the estate, and at the death of the last representative of that family, Sir Nicholas, in 1710, the estate passed to his daughter, Mary, Duchess of Norfolk. The exterior of the hall is more interesting than the interior. It was chiefly built during the transition period of the sixteenth century, and has remained practically intact. The inside, like most houses of the period, has suffered considerably through being divided into separate tenements and altered to suit modern ideas and requirements. Esholt Priory was next visited, and for over an hour the members, through the courtesy of the Misses Crompton-Stansfield, inspected the more ancient portions of the building and the numerous interesting relics that it contains. Amongst the latter may be mentioned an antique diamond and pearl watch; a beautiful ring set with stones, formerly belonging to the Prioress, a small cross in silver, being visible on one side; a copy of the *Leedes Mercury*, February 17, 1747; some valuable old Latin manuscripts and charters, including the gift of the advowson of Belton, grants to the Priory by the Wards and others; several antique dress swords; ancient Japanese needlework, and the nunnery table. In the oak-room are portraits of bluff King Hal and Edward VI., and numerous family portraits. Over the fireplace is the monogram of Sir Walter Calverley, the builder of the house, and some beautiful hollyhock carving. The adjoining room, known as Lady Julia Calverley's, formerly contained some beautiful pieces of tapestry along its panels, worked by that lady, and it is noteworthy that Sir Walter in his diary mentions that this work took his wife three and a half years to complete. Several old mirrors also adorn the walls, and some china painted with the armorial bearings of the Rookes, who were among the ancestors of the present owners. Some beautiful water-colours of local scenery, by Cox and other artists, are further attractions. On the way to the cellars, which form the most ancient portion of the Priory, the party passed to another room, containing a magnificent set of old china. In the cellars are the only remains of the Priory buildings, except an inscription outside. Two of the windows consist of lancet-headed lights. The courtyard was then inspected, and a short time was spent in examining an inscription therein of the last prioress, whose name, "Ilisbet Pvdsa, P" (prioress), stands out clearly. Mr. Margerison, at this juncture, gave a brief account of the families who had successively occupied the estate, and of the ancestors of the present holders. As time was getting on the party, betaking themselves again to the waggons, drove off to Calverley by way of the fine old avenue of elms which fronts the mansion, passing Nunwood, through Apperley Bridge, where some account of the diverting history of "Prophet" Wroe was given, through Calverley Woods on to Calverley Old Hall. This hall was the ancient residence of the Calverleys of Calverley. The chapel, the dining-room and withdrawing-room, with their relics of old oak, were inspected. The most interesting room is that in which the "Yorkshire Tragedy" was committed. Mr. Margerison, after giving a brief outline of that well-known crime, narrated some of the family history. The church was then visited, and its various features noted. Some small portion is of the Norman period, but it is chiefly of the Decorated style of architecture. The ancient incised memorial cross slabs which were found during the restoration of the church in 1870 were pointed out. The registers, particularly the entry of the two murdered children in the "Yorkshire Tragedy," were likewise viewed. During the day a tombstone of a former vicar, the Rev. Christopher Holt, who died in 1741, had been found in the village pinfold and brought to the church prior to the arrival of the visitors.

NORTHERN ARCHITECTURAL ASSOCIATION.

ON Saturday afternoon last an outdoor meeting of this Association was held, when thirty-eight members attended. Assembling at Jarrow, the first place visited was Christ Church, where the Rev. T. F. Paterson received the members, who examined the new chancel screens and fittings recently erected in memory of the late Lord Northborne, from designs by Mr. Crawford Hick, architect, of Newcastle. The party next proceeded to the old church (St. Paul's), which is one of the most ancient edifices in the kingdom. Embarking on board a steam launch, kindly placed at their disposal by Messrs. Brigham & Cowan, of South Shields, the members proceeded down the Tyne and viewed the lighthouse in progress of erection on the South Pier, and then landed at the pilots' landing. Conveyances were in waiting, and the party drove to St. Michael's Church, Westoe, where the Rev. C. E. Adamson conducted them over the building, which has just recently been enlarged by the addition of aisles from the designs of Messrs. Hicks & Charlewood, architects, of Newcastle. Thence proceeding to the village of Westoe, the members were,

by the kindness of the Mayor of South Shields, permitted to view his residence, which was erected several years ago from the designs of Mr. J. J. Stevenson, architect, of London. Finally the party proceeded to Harton Cemetery and inspected the chapels and entrance-lodge erected in 1889, and designed by Mr. Henry Grieves, of South Shields. Lastly the party was hospitably entered at the County Hotel by Mr. J. H. Morton, after which votes of thanks to him, to Mr. J. W. Donald and Mr. H. Grieves were carried by acclamation, as also was a similar compliment to Messrs. Brigham & Cowan and the Mayor. Among those present were Mr. Jos. Oswald, president; Messrs. F. W. Rich, vice-president; A. B. Plummer, hon. secretary; J. T. Cackett, hon. treasurer; Wm. Glover, H. C. Charlewood, J. W. Taylor, H. G. Badenoch, H. Grieves, J. W. Donald and others.

GENERAL.

Mr. Holman Hunt will deliver the Romanes lecture on Thursday in the Sheldonian Theatre, Oxford. His subject is "The Obligations of the Universities of England towards Art."

Mr. Pearson, R.A., has reported to the Peterborough Restoration Committee on the state of the west front of the cathedral. He expresses surprise that the front resisted the recent storm, and says it is absolutely necessary that its repair should be undertaken at once if its various features are to be preserved. The two main piers, he adds, lean over 2 feet, and insecurity is manifest in many places. As a precaution against accidents he suggests that the northernmost archway should be fenced off.

Arundel Church is not yet free from the attacks of the "weevil." Recently it was found necessary to construct a new roof over the nave, owing to the devastations of the beetle, but the aisle and transept are now being destroyed.

A Mosaic Pavement has been revealed at Silchester within the area of a building which, from its size and position, was likely to have been the residence of some man in authority. The inner part of the mosaic represented a figure subject, but too little remains to allow of any interpretation.

Dr. Waldstein, as Slade Professor of Fine Art, will deliver his inaugural lecture in the Senate House, Cambridge, on Saturday, June 8. The subject will be "The Study of Art in Universities."

The Scarborough Guardians have decided to send the six sets of plans received for the Workhouse Infirmary to the Local Government Board for adjudication.

Mr. W. E. H. Lecky has been appointed a trustee of the National Portrait Gallery.

The Surveyors' Institution held their annual dinner on Monday at the Holborn Restaurant, Mr. Daniel Watney, president, in the chair. It was stated that the Institution at present included 2,367 members, and that the annual income was 7,100*l*.

A Design by Mr. R. Clamp, of Woking, has been adopted for the new Methodist Church at Waverley Park, S.E.

Messrs. Giles, Gough & Trollope have been successful in the competition for the asylum at Hendon, for the Central London Sick Asylum District.

The Argentine Republic have invited designs from architects throughout the world for a new building for the use of the Argentine Congress. Three prizes, one of 20,000 *dols.*, one of 10,000 *dols.*, and one of 5,000 *dols.*, are offered for the most satisfactory designs, but as the prizes are to be paid in paper currency, which is worth 24 cents on the dollar in gold, the prospect of success is not encouraging.

The Yorkshire Water-Colour Society is the name chosen for a new society proposed to be formed at Bradford for promotion of this branch of art, and to be affiliated with the Yorkshire Union of Artists.

The Seventeenth Annual Exhibition of pictures by local artists has been opened at Nottingham Castle Art Museum. The works shown are in excess of the usual number.

The Duke of Norfolk will be invited to undertake the office of mayor of Sheffield next year, when the new Town Hall will be opened.

At a Special Meeting of the Royal Scottish Society of Arts the following resolution was adopted:—That in the opinion of this Society the time has now arrived when a decimal system of weights and measures (preferably the metric system or a modification of it) should be made compulsory by an Act of Parliament, to come into force as early as practicable after January 1, 1900.

Mr. J. W. Waterhouse, the painter, was on the 23rd inst. elected a Royal Academician.

The Architect.

THE WEEK.

ON Wednesday the Liverpool Corporation approved of the recommendation of the finance committee to complete the series of sculptured panels on the east side of St. George's Hall at a cost of about 3,000*l*. The work will occupy Mr. LEE for five or six years. At the same meeting it was decided to empower the library, museum and arts and technical instruction committee to obtain plans for the extension of the museum buildings on the land bounded by William Brown Street, Byrom Street and Clayton Street, and that the committee be authorised to devote to this object a sum not exceeding 200*l*. The new buildings will provide more accommodation for the museum, and also technical schools and a public hall. Sir W. B. FORWOOD said they were not now asking the Council to sanction the erection of the buildings; they simply thought it was desirable that they should obtain plans from the leading architects of the country, as the buildings would cost between 80,000*l*. and 100,000*l*. The site was, moreover, peculiar, and it would be necessary to have the aid of architects possessing experience of technical schools and museums. In doing this they cast no slur whatever upon their own architectural staff. It was also agreed that land should be granted to the DAVID LEWIS trustees for the proposed Northern Hospital which is about to be erected, as well as a sum of 10,000*l*. towards the funds.

ON last Sunday the fresco painted over the chancel arch of the Artists' Parish Church in Mount's Bay, Cornwall, was unveiled. This great picture, following the lines of the arch and angular roof, is 42 feet high and 22 feet wide, and covers in all about 300 feet superficial area. It was executed at the cost of a parishioner, Mr. BODILLY. The subject, "Our Lord in Glory," is boldly treated by the artist, Mr. J. GREGORY JONES. There are a hundred and twenty-three figures. CHRIST is represented standing on an orb, which is girdled by the crown of thorns. He is holding the banner of victory with His left hand and giving with His right blessing. A rainbow forms an arc over His head, and the nine choirs of angels, illuminated with rays of light, form a continuation of the halo around the SAVIOUR'S body. Lower in the fresco are two full figures, the Cherubim with thuribles, and further down on either side of the arch figures of MOSES and ST. PAUL, representing the old and the new Dispensation. The walls on either side of the new oak rood and chancel screen are enriched with deep shades of orange-red in cross-key patterns, whilst the massive granite arch is divided from the fresco by repeating patterns of fleur-de-lis in gold.

In many architects' offices there is a prejudice against indian ink that is sold in bottles, arising from the weakness it displays on paper when touched with water and colour. It is, however, possible to grind a large quantity of ink, and by the exercise of a little amateur chemistry keep it in a condition that will both endure and "wash." The operation is, however, tedious, and cannot be always entrusted to a pupil. We must also admit that if there is the least carelessness in a few years the lines sometimes change their colour, and therefore it may be well to refrain from describing the process. Even partial success in the preparation of ink does not make one more favourable towards a colour-maker's bottled ink. Fortified by discoveries of weakness in our own ink we were confident we could overcome manufactured ink without any difficulty. We must acknowledge that we failed with the new "Waterproof Indian Ink" which Messrs. WINSOR & NEWTON have produced. It sustained all the tests we applied, and which were more exacting than those arising with ordinary work. There is no doubt a very pure "tusche" is employed which is free from the adulterations which we believe to be the main cause of the unwashableness of modern inks, for the old inks would rarely run. Whatever may be added to secure fluidity in use and permanence of line does not, as

far as our tests are evidence, injure the paper. The waterproof ink "bites," but does not sink in the paper, for with it erasing is as easy as with any other ink. It is a time-honoured belief that indian ink should be ground in the morning before commencing work. That practice is a survival from the days when architectural drawing was a leisurely occupation. The hours wasted in preparing ink cannot be spared in these rushing times, when there is hardly a moment for thought; and with ink like Messrs. WINSOR & NEWTON'S awaiting us there is really no advantage in the ancient practice. It may be left to the enjoyment of archaeologists. The Waterproof Indian Ink only needs a trial to be generally adopted.

THE report of the Board of Trade on the strikes of 1893 appeared during the week. It has been ascertained that in 1893 there were 768 strikes and 14 lock-outs, in which no less than 636,386 persons were concerned, a number greatly in excess of that in the year preceding, which was 371,799. No less than one-fifth of the disputes of the year arose in the building trades, but happily the people engaged in them were not numerous, being only 2.8 per cent. of the total. But they must be considered as successful, as concessions to them were made in 46.4 per cent. of the disputes, which mainly arose out of questions of wages. It has been calculated that in 1893 the aggregate number of working days lost by the individuals affected was 31,205,062. The average number of days lost per individual was thus 49.7, or about one-sixth of the total working time of the whole year for each of the individuals. It is absolutely impossible, however, to determine what is really lost, and how much may simply be wage-earning deferred to a later period. But it can be shown what the money value of those lost days would have been if turned into labour. The general average value of each day's work included in the above figures would probably be about 4*s*. 3*d*., which would give an aggregate wage value to the periods of stoppage or of suspended labour of 6,581,075*l*. An estimate worked out in proportion from actual wages figures paid by a considerable number of firms concerned in the disputes gives a total of 6,603,135*l*. Returns supplied by employers show that in the case of 488 firms the estimated value of fixed capital laid idle was 16,160,325*l*., while in 373 firms the rateable value of the property laid idle was 710,239*l*. Four hundred and twenty-eight firms report that the total cost of closing down and restarting their works, and paying fixed charges during stoppage, amounted to 344,858*l*.

SETTLEMENTS on the north and east walls and in the north-east pier of the tower of the church of St. Mary de Laura, New Shoreham, have been observed, causing great anxiety to those interested in the preservation of this most beautiful church from further dilapidation. The churchwardens are in correspondence with a firm of architects with a view to obtaining an early report upon the condition of the tower, in order to arrest further mischief. The works are likely to be costly, and it is doubtful whether the subscriptions from Shoreham will defray the expenses. A "Breton Fair" in the town is about to be held in order to obtain some additional aid.

THE Bill for the licensing of architects does not appear to be yet signed by the Governor, and it is not therefore operative. Anyone who knows the history of New York speculative building can understand, says *Architecture and Building*, why a license for architects would not be received with favour. The improvement of the last ten years in this class of buildings has resulted from the advanced stand taken by good architects in private work; and it is well understood that a law which creates "licensed architects" will interfere materially with the employment by builders of cheap draughtsmen, and that it will be found essential to the sale of buildings to be able to assure customers that they are from the designs of "licensed architects," just as they now commend their exposed plumbing and other features which were first advocated by architects of advanced ideas. This law is further reaching in its influence than appears from reading its provisions, and its approval by the governor will mark a step in advance in American architecture.

TESTS OF CONSTRUCTIVE MATERIALS.*

IN connection with the Universal Exhibition of 1889 several international congresses were held in Paris. A desire was expressed by two of them for the appointment of a commission that would undertake to give the results of the most recent inquiries into the qualities of materials employed in construction, and secondly, that would exercise its influence in order to bring about more uniformity in conducting similar inquiries than now prevails. The French Government at once perceived the importance of the proposal. A commission was organised without delay. It was divided into two sections. For the first—that of metals—General GRAS, an eminent artillery officer, was selected as chief, with M. POLONCEAU, president of the Society of Civil Engineers; M. GODRON, director of naval construction; and M. FÉNOUX, one of the general inspectors of the Ponts et Chaussées, as vice-presidents. M. GUILLEMAIN, the director of the Ecole Nationale des Ponts et Chaussées, was appointed president of the second section, entrusted with the investigation of other materials, with M. CHARLES GARNIER, the architect; M. DURAND-CLAYE, director of the laboratory at the Ecole des Ponts et Chaussées; and M. BRÜLL, past president of the Society of Civil Engineers, as vice-presidents. With them were associated many specialists as members. The sections are still, we believe, pursuing inquiries, and with a task so important it would be unwise to fix on any term for their completion. But as the results will need a proportionate period for study, the Minister of Public Works has decided on the publication of the reports relating to the work of the first session. They will occupy four folio volumes, of which the first is before us.

It is not difficult to imagine what possibilities a commission of the kind must have opened out before men who were adepts in French systematising, and who were aware that their labours were to be scrutinised by experts throughout the world. The members must have also known there was a prejudice against them arising out of the skill in literary composition which is common in France. In the formal addresses of the presidents of the sections there is much which distinguishes them from the majority of English presidential addresses, but the reports are as severely practical as any official document that would express the conclusions of English civil engineers or mechanical engineers. The "Documents Généraux" form a volume that is not only more comprehensive than the report of the Royal Commission on Iron which was prepared about half a century ago, but in style is no less succinct and business-like than that important Blue-book.

The first volume treats generally of metals and cements as employed in construction. Each general report is based on a great number of special reports, which will be printed in succeeding volumes. As everybody knows, the qualities of a piece of metal, such as a plate or a rolled joist of iron or steel, are determined by observation or by chemical analysis or by mechanical trial. In the report the various ways of attaining the common end are described, and suggestions are offered which, if adopted, would secure a desirable uniformity, and enable the observations of one country to be of more use in other places. The general report on cements, including limes, puzzolanas, mortars and plasters, has to be treated differently. There is more variety in the materials, they can be combined in more different proportions than is possible with iron or steel, while the testing has to be of a more delicate kind, and there must be doubts about its efficiency. It is no wonder, then, that the members of the second section of the commission are obliged to say that, in the present state of our knowledge about the materials of masonry, it is impossible to point out what trials are necessary and sufficient to characterise in a general manner the cementitious products which are of good quality.

It is impossible to give an abstract in a few columns of a work which represents so much labour and is drawn from so many sources. It is essentially a book for specialists, and for those to whom the strength of materials is a subject which has interest apart from its utility. They can find

matter for consideration in almost every line. But the majority of men who are engaged in construction cannot be expected to spend time on chemical or mechanical testing of the materials they employ. They have to take them on trust, and the stability of structures in which materials were accepted in that way testifies how rarely the trust was misplaced. While, therefore, we are eager to see the knowledge of materials increased so as to comprise their molecular particularities, we must not conceal from ourselves that it cannot be always turned to account. A *résumé* of the conclusions may have, however, some interest for our readers.

Although so much importance is attached to chemical and mechanical testing of iron and steel, the report recommends that visual observation of specimens, and especially of fractures, should not be neglected. ROBERT STEPHENSON would not rely upon any examination of that kind, but men with less experience are more bold, and their expression of confidence in their own judgment is often amusing. It is not possible to lay down a system that will be adapted for all sections shown by fractures, but the French artillery have distinguished nine varieties which are marked by letters A, B, C, &c., according as the particles appear fine or coarse, uniform in size or colour, related to axis of section, &c. The observations apply to metals employed in artillery, and it has yet to be ascertained whether an analogous classification is feasible with more ductile metals. It is also suggested that more might be done to extend our knowledge of the value of resonance as a clue to defects, and an apparatus by Captain DE PLACE for that purpose is mentioned as likely to be useful.

Where tests are applied it is recommended that the specimens should be of a simple geometric form, such as a cube, cylinder, parallelopiped, and that pieces with "faces rentrantes" should be always avoided. Five specimens alike in size and form should be used, and the average of the results from them adopted. About the conditions of conductivity of heat and electricity the report can afford no addition to what is known, but it is recommended that the method of cooling or *refroidissement* should be more often applied. Exact information about corrosion from atmospheric agents, gas, vapours, liquids, and about the adherence of protective metals, as in the case of zinc on wire, is also mentioned as a desideratum.

The results of mechanical tests are said to be often no more than approximate indications, and are not to be accepted in all cases as representing the quality of the piece from which the specimen was taken. While tensile proofs are held to be necessary, it is suggested that they can be easily abused, and as they occupy much time, should be employed with moderation. In many cases a falling weight or the bending of a plate would afford as satisfactory a test. Suggestions are given about the most eligible places to cut out test pieces. In the case of castings where quality is to be exactly determined, a whole piece must be occasionally sacrificed. On the subject of testing machines for metals there is much in the report, but as they form a class which is rarely sufficiently represented in an exhibition, it was difficult for the committee to speak with precision about them. More testing has been done in England than elsewhere, but there is no mention in the report of an English testing machine, although French and American varieties are described. It is quite evident from occasional expressions that the authors of the report have not had much experience in dealing with the operations of testing, and unless we are mistaken it would not be difficult to get through some of the trials with pieces of inferior quality. But we must qualify that remark by saying that inferior iron or steel is not so defective as is commonly supposed. The report also treats of tests for compression, flexion, torsion, &c., the treatment of long and short pieces and other matters.

Shearing strains are as familiar as those of tension, and it is generally accepted that there is not much difference between them in respect of a structure. The reporters are eager that experiments on shearing should be kept up, as apparently there may be much to be yet learned about the subject. According to M. LAVALLEY's experiments, the effect of double shearing, as in the case of ordinary rivetting, is equal to '80 of the resistance to tension, but with soft steel the value was '83, and with steel of middling hardness '77, while in one case it was '63. M. DAYMARD, therefore,

* *Commission des Méthodes et des Matériaux de Construction. Première Session, Tome I.: Documents Généraux.* Paris: Imprimerie Nationale. J. Rothschild, Editeur.

concludes that in course of time the pressure of the rivet against the plate or bar may overcome the power of resistance, and Professor KENNEDY'S experiments would appear to show that that consequence was not improbable, as after a time iron and steel lose much of their elastic power under strains. There is enough uncertainty on the subject to warrant systematic trials in several countries.

The recommendations about cements are offered with extreme caution. That cement is produced in France is known to every one who lands at Boulogne, but the trade is mainly local, and is never likely to attain the importance of the English, German, or American industry. It is not to be supposed that national interests alone were kept in view by the Commission; at the same time it would be unwise to propose tests which French cement might not sustain.

When testing cement it is suggested that four samples should be taken, which should be passed through sieves with meshes of 324, 900 and 4,000 to the square centimetre. In weighing the cement the portion retained in the 900-mesh sieve, as well as the portion agglomerated by the humidity of the air after being pulverised, should be mixed with the rest of the sample. Care should be taken to keep the temperature constant and at about 59 deg. Fahr. In analysing cement all the elements should be stated. A magnifying glass should be used to observe any want of homogeneity, and if any grains appear to be foreign matter they should be analysed separately. For testing by breaking the form of briquette used in France is recommended, although it is admittedly far from perfect. As it has in the centre or waist two small concave curves, there is abrasion in that part; the German briquette is open to the same objection. The English section has no sharp curves, and in consequence the same quantity of material remains until the briquette is broken. The objection against it is that the minimum width is not so readily measured as in the French and German briquettes, but as the size of the mould is known that is sufficient. Any assistant could make an English briquette, but it needs care to mould the numerous curves of a foreign section. M. DURAND CLAYE is experimenting on a briquette in which curves are avoided except on the upper and under surface; but it does not appear to have any advantage over the ordinary English form. It was remarkable that several members of the section took advantage of the difficulty which is supposed to attend the discovery of a perfect briquette by proposing that all tests of tension should be abandoned, since if only resistance to compression were considered, the purchaser of cement would still have a guarantee of quality. But the good sense of the majority was in favour of present arrangements which are derived from English practice, and which recognise crushing as well as tensile resistance. The indifference to what has been done in this country in iron and steel, as well as in concrete, gives to the first volume too much of a speculative character. That will of course affect the success of the work, not only in this country but elsewhere. Engineers from all parts of the world come to England to complete their experience by gaining serviceable notions, and to be deprived of that advantage is a confession of weakness. Hence it is that the contents of the first volume will appear to many as only a record of the doubts and fears, as well as the hopes, which arise in the laboratory. It is true unity must be sought after in a collection of exhibition reports, and a few papers on English testing, steel beams, and cement making would be as much out of keeping with the rest of the contents as GULLIVER was among the Liliputians. French readers, moreover, could not appreciate the manner of doing business in which a product is preferred to a formula. To appreciate the volume it must be judged from a French standpoint, but when the reports that were sent in to the Commission are printed they may appear to be more in keeping with our insular notions of constructive requirements.

An Ancient Alms Chest has been restored to the Meriden parish church. It bears the following inscription, "Donum Henrici West, Anno Domini 1627. 'This chest is God's exchequer; paye in then Your almes accepted both of God and men.'" The lid was discovered in a stable. An old chained book, which probably belongs to the church, has also been found in the vicarage-house.

THE ROYAL EXCHANGE.

ON Thursday in last week the Lord Mayor, who was accompanied by the Sheriffs and the Gresham committee, which is composed partly of members of the Mercers' Company and partly of members of the City Corporation, unveiled the two paintings which have just been completed by Sir Frederic Leighton and Mr. Macbeth at the Royal Exchange. Addressing the Lord Mayor, the Rev. J. Baden Powell, the master of the Mercers' Company, stated that in 1891 it occurred to Mr. Deputy Snowden, the then chairman of the City side of the Gresham committee, that it would be advisable to fill the twenty-four panels in the interior of the Royal Exchange with paintings illustrating English history with reference to the City of London, and that the scheme should be carried out under the advice and direction of the Royal Academy. A meeting was held at the Mansion House on December 16, 1891, when Sir David Evans, the then lord mayor, Mr. Deputy Snowden, and Mr. Ralph C. Palmer represented the committee, the Royal Academy being represented by Sir F. Leighton, Mr. Calderon and Mr. Eaton. Eventually a list of subjects for the panels was prepared, and submitted to and approved by the Gresham committee, who requested Sir F. Leighton, Mr. Calderon and Mr. Poynter to assist them in carrying out the work, and the list of subjects was approved by those gentlemen. Sir F. Leighton very generously offered to execute himself and present to the Gresham committee a painting representing *Commerce between the Ancient Britons and the Phœnicians*, and the committee gratefully accepted the offer. At the same time Mr. Deputy Snowden offered to present to the committee a panel representing the opening of the Royal Exchange by Her Majesty in October 1844, and the painting of this work was by the advice of Sir F. Leighton, Mr. Calderon and Mr. Poynter, entrusted to Mr. Macbeth, A.R.A. The pictures have been painted on canvas, and have been attached to the walls, under the supervision of Messrs. Roberson & Co., by a French process called marouflage.

THE UNIVERSITIES AND ART.

THE lecture established by the late Professor Romanes at Oxford was delivered on the 30th ult in the Sheldonian Theatre by Mr. Holman Hunt, whose subject was "The Obligations of the Universities of England towards Art." He began by saying that the founder of the lectureship was proved to have been an ever-diligent and conscientious student. This was seen by the problems in science which he examined and solved, and by his faith in the inexhaustible character of research to which he ever gave witness. In addition to these attributes of a master of his craft, there was in Professor Romanes the crowning spirit which ever marked the man who was something more than a mere specialist. The lecturer pointed out that in all times there had been evils which had been inherent in the society in which art had arisen, and that a proportion of these had grown and accumulated about her while she had been overcoming other ills. He did not hesitate to avow the belief that, on the whole, French art had done great harm to the world, and that what it produced was the anti-Christ, an art which was not an emanation from love, but from hate. There were some among the nation who heard the appeal, "Come out of her, my people." These, he knew, would concur in his verdict and agree that the nation had adopted the impure entanglements of the art of previous nations, and found original delusions in addition, so that false sentiment, triviality of purpose and negation of elevated thought and beauty, and even more blamable defects, had become their own gospel to follow and preach; and, as this was easy to understand and practise, too many apostles were induced to spread it abroad. Yet it must be admitted that there were one or two naturalistic sculptors in France who had produced admirable works, and these were true representatives of her Mediæval sculptors. Our painters had done little in the branches of historic or ornamental work, because the opportunity had been denied them, and whenever English youths committed themselves to art their prospects of making their lives productive were destroyed, every foreigner that appeared being greeted with applause, while the young Englishman had to struggle against prejudice and abuse. He protested against this, for it ruined the purest and best of art under heaven, where in the happiest circumstances the career of an artist, for want of that patronage which continental governments gave, must be a hard one. It was not a case of reciprocal emulation, for no other country welcomed English artists in return, even for its future countrymen's sake. However, he would not attack this established prejudice. It was in no sense a personal question. He spoke to save their nation from the disgrace of an art which was in no sense its own. He urged that the obligations of the universities towards art were to consult the position of, and to take steps towards defending, honest English design. The schools of design were first established in accordance with Haydon's

suggestion to revive decorative and ornamental invention, which had died out altogether in the reign of George IV. It was seen that for many years they had entirely departed from their original purpose, so that the authorities at South Kensington were now wisely taking steps to prevent the inordinate training of mere canvas painters. What had been the great want throughout his term of observation had been the due cultivation of art knowledge by the rulers of their land and of those who directed public opinion. In his view there should be no insuperable obstacle to affording the cultivation wanted. He had striven to prove that literature and design were prompted by the same spirit. It followed that a good taste in literature should need little to make it an infallible judge of the sister art, but it wanted that little, and they had but too many examples to show that for want of it serious disgrace had fallen upon their nation. The system of appointing on committees of public taste gentlemen who had gone through no system of education to guard them against false conclusions was too often disastrous, as had been proved many times over in the treatment of the best sites in London, notably in the case of Trafalgar Square. They might imagine that the difficulty of selecting the proper artists to execute public works would be overcome by a public competition, as it was in Italian days. The answer was that meretricious art had not then been invented. The umpire had simply to judge between one class of honest workmanship and another. The antidote to false taste was stronger than its poison. With extensive examples of the art of all peoples and periods before him, and the knowledge that each is national, and with sound recognition of what is base and enervating in literature, no educated man should despair of understanding our art. But he must be prepared patiently to sift away delusive sophisms. The first step towards this end should be to supply graduates of the universities with a radical knowledge of the sciences employed in art, to qualify them for the development of a good judgment. All barely theoretical teaching was apt to mislead the amateur and puff him up with conceit. His study should be practical, and of matters that were sure. It might be a question how far such training should extend, but it might be at once laid down that a full acquaintance with the proportions of the human figure was required, with the laws of balance and equipoise which controlled movements and the carrying of weights. Beyond such acquirements, a knowledge of the laws of perspective should be attained, and, as the due corollary, the simple laws of light and shade might be mastered. These and some understanding of the varieties of each people's decorative design, if well established in the amateur mind, might entitle a young man to a degree which should qualify him for any post of responsibility in the control of national works or in publishing opinions on matters of art. He would only add his assurance that such a simple provision by the universities as that indicated would impart great vitality to the whole range of English art design. If art was to be living it must belong to their daily life, their national needs, and their state and their religion.

THE NATIONAL GALLERY.

THE following are the latest additions to the national collection:—Mr. Charles Butler has presented a full-length portrait of Cardinal Richelieu by Philippe de Champaigne, which he purchased at the sale of the late Mrs. Lyne Stephens's collection. Sir J. C. Robinson has given a large picture of *The Expulsion of the Moneychangers from the Temple*, by Theotocopuli, better known as Il Greco. The Earl of Carlisle has presented to the Gallery the picture of *The Circumcision*, by Giov. Bellini, which was exhibited at the New Gallery during the winter. Mr. J. P. Heseltine has given a picture of *The Virgin and Child, with Angels*, of the School of Gentile da Fabriano, early fifteenth century. Mrs. Edwin Edwards has given a picture of *A Pasturage in France*, by François Bonvin, of the modern French school. These pictures will shortly be hung in the Gallery.

The Duke of Westminster has presented to the Gallery Hogarth's celebrated picture of Calais Gate, which he purchased some three years ago. It was then thought a desirable acquisition for the National Collection, but, being without sufficient funds at the time, the director was unable to buy it. The picture is at present on loan to an exhibition at Chester.

Mr. George Salting has lent for exhibition in the Gallery six pictures of the early Flemish, German and Italian schools, viz. a portrait, attributed to Antonello da Messina, which was in the Venetian Exhibition at the New Gallery; a portrait by Christoph Amberger; another by Bartolomäus Bruyn; a *Virgin and Child*, attributed to Hugo van der Goes; a *Virgin and Child*, by the Master of the Death of the Virgin, of the Cologne school; and a portrait by Petrus Cristus, from Lord Northbrook's collection. These will shortly be exhibited on a screen in the Central Octagon Room.

The following pictures have been purchased for the

Gallery:—*The Holy Family*, by Sebastian del Piombo, which was lent by the Earl of Northbrook last year. It hangs in Room No. VII. *The Vision of St. Hubert*, by Vittore Pisano, which was exhibited by the Earl of Ashburnham in the Florentine Exhibition at the New Gallery in 1894. This is not yet hung in the Gallery. *The Descent of the Holy Spirit*, by Barnaba da Modena, hung with the early Italian pictures in the north vestibule. *Landscape, with Hunting Party*, by Van der Meulen, purchased at the Lyne Stephens sale, and placed in Room No. XI. *A Head of John the Baptist*, Milanese school, placed in Room No. IX. From the sale of Lord Clifden's collection:—*Interior of a Church*, by Gerrit Berkheyden. *Landscape, with a Portrait of a Gentleman holding a Horse*, by Stubbs. *Covent Garden Market*, by B. Nebot (attributed to Pugh in the catalogue of sale), and *A Gondola*, by Fr. Guardi. These will shortly be hung in the Gallery. Of the pictures lent in exchange by the Science and Art Department, the fresco-painting of *The Nativity*, by Pietro Perugino, has been hanging for some time in the Umbrian Room, No. VI.; a head of *St. Dominic*, by Giov. Bellini, is placed on a screen in Room No. VII.; others will be placed in the Gallery shortly.

KIRKSTALL ABBEY.

HAMMER and chisel are busy at Kirkstall Abbey just now, writes a correspondent of the *Manchester Guardian*, busier than they have been, perhaps, since the year 1583, when labourers were employed at sixpence a day to remove fragments of the old monastery for the repair of Leeds Bridge. Were this a "restoration" that the workmen are now engaged upon a good many people would probably unite in regretting that the sixteenth-century vandals had not completed their work. But it is not a restoration; it is a preservation, designed to hand on to the next century the still noble remnants of an edifice which has suffered much decay even within the memory of men of our own time. We of the present generation, however, are not building up this legacy for posterity without a sacrifice. Anyone in whose mind the abbey lives as a lofty though broken pile of picturesque masonry, its irregularities of outline softened and the wide gaps in its grey walls almost hidden by an overgrowth of ivy; who recalls the picture as a combination of harmonious colour, mellowed by time; who remembers that the river which makes the photographs look so effective was latterly the only real blot on the scene—anyone retaining those impressions, if he were to revisit Kirkstall now would receive a sharp shock. The walls are stripped of their evergreen garment, the shattered remnant of the great tower is surrounded by a scaffolding upon which the masons are at work, and here and there at various angles of the ruin the grey monotone of the old stonework is violently broken by huge patches of crude, new masonry. This sounds unpromising, but further investigation will modify the first feeling of alarm, stimulated as that may be at the outset by one very singular addition that has recently been made to the place. Some years ago the land in the neighbourhood of the ruins, together with the abbey itself, was presented to the Corporation of Leeds by Colonel North, and steps were taken to lay the property out as a recreation ground. Strange to say, a portion of the site closely adjoining the monks' infirmary is now being used as a rubbish tip. Approaching the abbey by the high road from Leeds you have the rubbish heap facing you, with perhaps a Corporation dust-cart looming large in the foreground. Poor Kirkstall. It has suffered many vicissitudes and much indignity. Admirers of Turner will remember the graceful print in the "*Liber Studiorum*" of the crypt or abbot's hall. This apartment had the misfortune to retain its roof down to a comparatively recent date. The roof was easy of access and offered a pleasant flat surface above. Here was a combination of advantages too inviting to be resisted. The flat roof became a dancing platform, and was ultimately danced out of existence. But that, speaking in ordinary terms, was a long time ago, and there was no public control over the abbey then. Under the municipal government higher ideals are looked for.

The addition of a public dust-heap to the environment of the abbey is the more inexplicable when we consider the bold yet discriminating policy which is being applied to the preservation of the ruins. Before proceeding to patch the fragments together the Corporation sought counsel from the Society of Antiquaries, and it was on the advice of that body, we understand, that Mr. Micklethwaite, a London architect, and himself a member of the Society, was invited to undertake the duty. Mr. Micklethwaite's policy, judging it by such examples of his work as are already complete, appears to aim simply at the firmer establishment of those portions of the building which still remain above ground. He takes a shaky wall and, without attempting to reconstruct its parts, buttresses it where necessary in such a fashion that future generations will perceive at a glance that this was the original masonry, and that that was a

mere buttress put up at the end of the nineteenth century to keep the wall from falling. In a number of instances, however, it has been found necessary to rebuild. Some of the arches in the nave of the church had lost the support of their original columns, and in order to preserve them the architect was compelled to insert new shafts. His method of maintaining a distinction in such cases between the ancient and the modern workmanship is simple yet effective. The original pillars are round, whereas the new ones are merely blocked into a somewhat similar shape, but left unfinished. The difference, although only a difference in detail, is sufficiently self-explanatory. But Mr. Micklethwaite is not afraid of a startling contrast when he wants to make his meaning clear. For a daring example of his method one may take the treatment of the broken arch at the south-west angle of the transept. Here the architect has raised a new stone pillar which he carries to a great height, almost side by side with the original column, until it meets and supports the over-branching fragment of the arch. Nobody will ever mistake this piece of work, considerable as it is, for anything but a gigantic prop. It is honest but incongruous, and at the sight of it the soul of the Philistine yearns for a compromise. There is perhaps only one notable instance of reconstruction pure and simple. Not long ago one of the minor beauties of the church was the curiously ornate arch at the eastern extremity of the south aisle, peculiar amidst its severe surroundings by the elaborate zigzag decoration of the spandrels. When the Corporation took their present task in hand this part of the aisle had just begun to give way. Pieces of the masonry were found lying on the ground. Fortunately none had been removed or destroyed, and accordingly they were replaced, without addition of any kind except the mortar by which they are held together. There are other examples of this kind of restoration, but none possibly quite so important or so grateful in its results.

Perhaps, however, it is too early yet to pass judgment upon the scheme. The work will not be completed till September. The only thing quite certain about it is that it will preserve for an indefinite stretch of time a relic in which the ecclesiastical architecture of successive periods between the twelfth and the sixteenth centuries is represented, and that in the meanwhile and it may be for a long term of years, the purely pictorial—one might say the externally romantic—aspect of the ruins will be seriously marred. That is the price paid by us for a boon which posterity will enjoy. When, as a preliminary step, the ivy was forcibly divorced from the old stones to which it had clung for many generations, the act seemed almost fatal. But it was not to be avoided. Ivy will disintegrate stone and mortar as surely as it will caress the life out of a tree. One of the missions of the modern archaeologist is to go up and down the country stripping the loveliest bits of ivy from the most appropriate corners of interesting old buildings. At Kirkstall, it seems, we are to have an overgrowth of Virginia creepers to take the place of the banished evergreen. This may do something, for a season at any rate, to curve the sharp angles and soften the crude patches which are now part of the form and colour of the abbey. But we must look for our real consolation, apart from the practical one of the preservation of the ruins, to the new discoveries that have been made by the excavators. It is possible now to trace the whole plan of the great monastic pile which the first abbot began to put together for the Cistercian brotherhood more than seven hundred years ago. The domestic devices and habits of the inmates are recalled to us in curious detail by the circumstantial though silent evidence of the stones. We know that they modified the appearance of the cloister court, still the most beautiful and perhaps the most complete part of the monastery, by erecting a temporary roof on each side of it, so as to provide a sheltered walk in wet weather; and that in the cold season of the year they enhanced the comfort of this resort by screening a portion of it with curtains. We can tell, of course, where they ate their meals and how they cooked them, with what degree of hospitality they received a wayfarer, how they dealt with cases of sickness and what they knew about drainage. The guest-house, unearthed last year on the western side of the abbey, is believed to be almost the only one remaining in England, and it will be guarded as a treasure. Other rediscovered relics are of a more portable character, and it is possible that the most interesting of them may ultimately be arranged under one roof. In the old days—or rather in Kirkstall's later days as a living institution—the builders were apt to dispose of loose material by working it up for any structural alterations or additions that might be in progress. Thus in the chapter-house itself more than one stone coffin may be seen embedded in the walls, where apparently the builder must have placed them just as he would place any other block of stone. Stone coffins were plentiful in those days, and at Kirkstall they are not uncommon now. But they are too good to build with. The intention is to provide them with a resting-place in some appropriate corner of the abbey, together with other interesting relics, of which the variety even now ought to be sufficient to draw many pilgrims to the shrine of St. Mary.

THE ROYAL TOMBS IN WESTMINSTER ABBEY.

FOR some time past, writes Mr. William Morris, there have been rumours afloat that it was intended to "restore" the royal tombs in Westminster Abbey. These seem traceable to the fact that the President of the Society of Antiquaries had had his attention called to the alleged bad condition of the monuments. The result of this has been that Mr. J. T. Micklethwaite, whose knowledge both of the past and the present of the Abbey probably surpasses that of any other person now living, was commissioned to report on the state of the royal monuments to the executive committee of the Society of Antiquaries. His report disposes of the alarmist view that there is any serious deterioration going on in these monuments. They have, indeed, suffered from the effects of violence that took place during the civil and ecclesiastical strife of the sixteenth and seventeenth centuries, and they are worn by time and London filth: but the Dean and Chapter cannot justly be blamed for any neglect of them, as they have done what they could to keep them in a condition at once sound and genuine.

It is possible, however, that the rumour above mentioned may lead to a cry for their "restoration," in the technical sense of the word. I ask permission, therefore, to address a word or two to those who are not contented to see these invaluable records of several centuries of our history, these beautiful examples of a past art, left in a sound and genuine condition.

I fear there are those who wish to change the present appearance of these monuments, who believe that it is possible to bring them back to their original splendour. They would, no doubt, replace the vanished mosaic in the twisted columns of the Confessor's shrine, replace the partly-perished marble by brand-new slabs; do the same by the Purbeck marble of Queen Eleanor's tomb, and polish the new work till it shone like glass (for such things have been done elsewhere); make new lions for Edward III.'s feet to rest on; regild Richard II., and rechase the crowned and chained hart and the sunburst, which makes such a beautiful pattern, on his robe; and (why not when once started on such a road?) cover the wooden core of Henry V. with new metal, and make a new head for him at a guess. It is a matter of course that all the architectural details of canopies and subsidiary figures would be done again, in imitation or guesswork of what yet remains. All this could be done by means of the expenditure of money, and it will be done if the "restorers" have their way, for they will not stop short of it. And what would be the result of it? We should have a set of models more or less ingeniously got together, partly by servile and inartistic imitation, partly by guesswork from the originals. Such models might, indeed, be made for exhibition in some popular show, some old Westminster yet to be produced, and might amuse a good many people for a time, and they would be innocent enough if the originals were left in their integrity. But that is not the possible proposition; the "restorers" would try their experiments on the very historical records and works of art themselves; which means, in plain words, that before "restoring" them they would have to destroy them. The record of our remembered history embodied in them would be gone; almost more serious still, the unremembered history, wrought into them by the hands of the craftsmen of bygone times, would be gone also. And to what purpose? To foist a patch of bright, new work, a futile academical study at best, amidst the loveliness of the most beautiful building in Europe.

I cannot and do not believe that the Dean and Chapter would consent to the perpetration of such a monstrosity, but I feel that it is well to be in time in such matters and to protest before any considerable number of persons should get themselves committed to a scheme, the carrying out of which would be nothing short of a national disaster.

Mr. W. H. St. John Hope adds that an excellent object lesson in the "restoration" of a tomb is afforded us in Westminster Abbey itself. In the middle of St. Paul's Chapel there once stood an ancient Purbeck marble tomb with alabaster effigies of Sir Giles Daubeny, K.G., ob. 1508, and his wife. A few years ago, in spite of every protest, this tomb was effectually "restored," at the cost, I believe, of a representative of the Daubeny family, by making an entirely new tomb, enclosed by a metal gate. The old effigies were laid upon the new tomb and the pieces of the old tomb put inside it. So much for the treatment. The effect may best be realised by an inspection of, say, the tomb of Edward III. or that of Queen Eleanor, then of the "restored" Daubeny monument.

Another object lesson may be learned at Worcester, where one unfortunate royal tomb has already been operated on. Here, in the middle of the choir, stands a Purbeck marble tomb of the fifteenth century on which lies the thirteenth-century effigy of King John, also of Purbeck marble. This was "restored" in 1873 or 1874, by Her Majesty's Office of Works, by overlaying the marble effigy from head to foot with gold leaf to imitate gilt-bronze. The mutilated crown upon the

king's head was at the same time covered by a gilt metal circlet.

I was pleased to see, a year or two ago, that the gilding had already been rubbed off in places, thus disclosing the remains of the colour with which the effigy had anciently been decorated.

GLASGOW ARCHITECTURAL ASSOCIATION.

THE usual monthly meeting was held in the rooms, 114 West Campbell Street, on Wednesday evening, the 3rd inst., Mr. Alex. N. Paterson in the chair. Mr. Wm. J. Anderson, A.R.I.B.A., read a paper entitled "The Early Development of the Christian Church." The lecture was illustrated by limelight views, and there was a large attendance. Mr. Anderson said at the outset that the history of early church building was a subject of great importance in several aspects. To the ecclesiologist it was of interest as the study of the earliest forms in which the church was worthily realised, and it was his peculiar function to reconstruct its doctrines from its stones. To the architect it was interesting in its evolution or gradual adaptation to its purpose, and as the chief link between Classic and Mediæval art. The former frequently attempted to construct the edifice on a presupposed symbolic basis, rejecting the aid of true archæology, and deriving it from purely spiritual ideas; whilst the architect found its prototype in the forms of surrounding buildings, the customs of the times, and the habits of the race, under its necessity for provision for the wants of a new faith. The safest point of view was to reject symbolism in the plan and fabric of early buildings and regard them purely as developments arising out of practical necessities. The art of planning or disposing buildings had at the time made great progress among the Romans, but one building was still the pattern of another to a greater extent than with moderns. It was rational to look for a model, or models, of the church in the buildings which surrounded its inception. The lecturer proceeded to sketch the relation of the church to society and public life during the early periods of its existence, and suggested the probable adaptation of a house on the Roman plan for the purpose of worship, and indicated the arrangement of the congregation.

At times the waste places and catacombs were perhaps the chief meeting places of the persecuted sect. There the Christians had buried their dead, and had recourse to these hiding-places for secret assembly and communion; probably these catacombs were held in veneration long after the necessity for using them had ended. Considering the other buildings with the forms of which the early Christians must have been familiar, the lecturer dealt with the possible influence of the Roman basilica or law court, and concluded that it was difficult to credit the theory that these buildings were ever used as churches. Certainly this could not have happened till the time of Constantine, under whose reign the Christians emerged into the light of imperial favour. Even then the law courts would be required for business purposes, and the only buildings which became useless were the temples of the gods. It was a mistake to assume that there were no Christian churches previous to the time of Constantine. There were frequent and long periods of toleration during the first three centuries, and there was every reason to believe that churches were built and other buildings employed and adapted previous to the reign of Constantine, even in Rome itself. The lecturer was inclined to think that it was in such temporary abodes a long process of adaptation to the forms of service must have been going on, which ultimately took form in the huge basilican churches erected in Constantine's day. The key to the diversified types of plan, and perhaps in some measure to the general problem, was possibly the persevering continuance through everything of varying heathen superstitions and practices. The arts of the Roman Empire came everywhere under the influence of the capital, yet religion preserved its local colour and form. In order to understand the peculiarities of plan of the early churches it was necessary to have some idea of the customs of their services. The essayist described fully the service, and the relative position of the four orders of catechumens or penitents to those in full communion. A description followed of the normal form of basilica church, after Constantine. At the conclusion of the very interesting lecture Mr. Anderson received a hearty vote of thanks.

TESSERÆ.

The Nude in Art.

IT will appear, on profound consideration of the subject, that the naked figure in statuary should only be introduced where it is necessary, either in consequence of the nature of the story told, or in order to produce the expression of something higher and more spiritual than can be otherwise rendered by art. Applying this test it will be found that by much the greater number of such works among the moderns are simply naked

men and women; and although often very innocently so, still, in the very unnecessary choice of the artist's choice of form in this respect, already below the level of high art. The necessity of a nude figure depends, then, upon the nature of the subject, or the peculiarly ideal meaning and expression which is sought to be conveyed. There are few subjects proper for sculpture in which the nude figure becomes necessary, because it is simply degrading to the dignity of sculpture to employ it in the mere attitudinising of well-drawn figures, as we often see where a sculptor selects a subject as if merely to show what he can do in marble. When the artist has communicated not the least of spiritual or intellectual expression, his work descends to the level of a mere portrait of a naked woman, but certainly in his hands by no means a satisfying subject of contemplation to a tasteful mind. Considered strictly in the essence of its design, the most perfect of all created works is the yet undegraded form of man. And to be the most perfect among the many countless thousands that are so beautiful and so varied, what must its excellence consist in? Not in the mere expression of contenance, though it is this which distinguishes the human being from the many beautiful but irrational creatures which are given him to be his subjects. In more than this. In the perfect and appropriate form and colour of every part of his frame, each portion suitable in itself, strong in sufficiency, graceful in strength; neither brutal nor effeminate, preserving ever that just medium of wholesome moderation in powers and proportions which itself in every part of man's body already represents the character of his reason applied in the government of his soul; in all these things, and such as these, the perfection of the creation is made manifest, and in each individual one of these things, the reasonable nature of man, while it finds its ordinary expression in the living reality, may be, and ought to be, in its highest manifestation by artistic representation. The strength which is sufficient for defence, and energetic enough to protect the just independence of self and of what properly looks there for safety; but that strength reasonably controlled and habitually exerted in peaceful industry, the intellect which is prompt and vigorous to care for, and direct well the things of this world; but that intellect reasonably controlled from the too exclusive enjoyment of its earthly power, and directed at all moments heavenwards by the perpetual consciousness of an existence far higher and supremely clear—such are the characteristics of man, which every part of his corporeal form is (in its healthy and undegraded state) fitted to express. And in woman the complement of this self-sufficing intellectual character and protecting physical power—in woman the finer sensitiveness of a purer moral nature, the softer and more delicate instincts of a tenderer and more devotional spirit, gain expression in that wonderful series of soft and richly-flowing lines which make her perfect figure the very embodiment of the highest grace formed into life. A form which should, by its faultless grace and matchless simplicity of beauty, express in every part that sweet and lofty destiny of woman—the preserver of purity in this world, and the example of devotion towards the next. And this is what art must express for us in the female form, or it had best not meddle with it. Her delicacy must not be intruded on save in the performance of her highest mission; and if her form do not raise up our minds and fill us with a holy purity of soul, then it fails of its first object, and it becomes degraded, and may well be removed from before our eyes.

Greek Pottery.

The Greeks and Romans employed two distinct materials in their pottery, one of which yielded a coarse, almost granular, not very homogeneous or uniformly coloured and very porous mass; and the other, which yielded a body beautifully homogeneous, a porcelain-like grain and very dense. The amphoræ, cinereal and lachrymal urns, in which the ashes were placed in the tombs, were made of the first-mentioned substance. The amphoræ were often of gigantic size, sometimes from 8 feet to 10 feet in height and 3 feet in diameter. The celebrated tub of Diogenes was an amphora of this kind. In Spain enormous jars, called tinajas, are made for holding wine, oil, flour, &c.; two localities are especially celebrated for these articles, Castello de los Jarrès and Colmenar de Oreja, not far from the celebrated royal residence of Aranjuez, where jars 13 feet high and 7½ feet in diameter are made. Similar vessels are also used in the South of France and in Italy, and, indeed, in all the Mediterranean countries, though, perhaps, not of such a remarkable size as the Spanish ones. The statues and finer vases and tazzas of antiquity were frequently coloured in the clay, some black, some brownish-red, and others of a beautiful sealing-wax red, hence named *terra sigillata*. In addition to this colour of the body the surface was also usually coloured; the statues, architectural ornaments and tombs, being often green or blue, and the vases or tazzas being sometimes ornamented with black silhouette-like figures on the red body, these being considered the most ancient; while those with the figures in red, buff and white on a black ground belong to the highest period of Greek art. Three different classes may be noticed,

those with black figures on a red ground; those with brownish-red figures on a black ground; and yellowish-white or buff-coloured figures on a black ground. The body in all cases is red, in imitation of *terra sigillata*, the black figures being made in a sort of clay pigment, worked up with quick-drying oils, and subjected to a considerable temperature, the black colour being thus produced by charcoal. Many of the old vases were also covered with an exceedingly thin glaze or glass, consisting of silica, iron and soda, which must have been very pretty. This glaze has been found to consist of a combination of silica and soda, or rather of clay, with that substance, being, in fact, a true glass; but it is doubtful whether, like our modern salt-glazed ware, it was formed with salt. This species of glazing appears to have been known at a very early period, for many articles, especially bricks, glazed in this way have been found at Nineveh, some even of various colours; and Herodotus mentions that the walls of the palaces of Ecbatana, in the empire of the Medes, were painted of seven colours, meaning, in all probability, walls built of these coloured and glazed bricks. The Greeks and Romans do not appear, as far as is known, to have used glazed pottery (although well acquainted with it) to the same extent as the Eastern nations; they did not, consequently, make any improvements, at least none which have reached us.

Italian Marbles.

The Italians have a complete marble nomenclature, and many of these names are well known in other countries. Among the most celebrated are the ancient marbles so admired in antique vases, mosaics, &c., such as the *nero antico* or black antique, which is a beautiful intense black marble; the *rosso antico* or red antique, which is a deep blood-red marble, sprinkled with minute white dots; the *giallo antico* or yellow antique marble has a deep yellow colour with black rings, and sometimes rings of another shade of yellow; and the *verde antico* or green antique, which is of a clouded green colour, consisting of a mixture of a mineral called serpentine and limestone. The oriental *verde antico* was not marble, but a porphyry. The precise localities from which these marbles were obtained is not now known, the quarries being in all probability concealed by rubbish, but they appear to have been found in abundance in Greece and Asia Minor as well as in Italy. Many modern marbles resemble them so completely that they may be considered identical; for example, the *verde antico*, or *verde antique*, as it is called by the French, is found at Genoa and in Tuscany, and is one of the most prized marbles of Italy. There is a variety of it termed *polzivera di Genoa* and *vert d'Egypte* by the French. At Bergamo is found a beautiful black marble called *paragone*, which is scarcely inferior to the *nero antico*. Among the other celebrated Italian marbles we may mention the *panno di morte*, or death-shroud, which is a black marble with a few white shells scattered through it; the *brocatello di Siena*, or brocade of Siena, which has a yellow ground, with irregular veinings of bluish red or purple. The *porior* is a beautiful marble from the Porto Venese, hence the name, which was so much employed in the decoration of the palace of Versailles under Louis XIV. The ground is of a beautiful black with veinings of yellow, which have a charming effect. The *mandolato* is a light red marble, with yellowish white spots like almonds, whence the name from the Italian *mandola*, an almond; it comes from Lugezzana. At Verona are found some beautiful marbles—one, a red inclining to yellow, and another with a paste composed of stripes of red and green, with large, pure, white foliated spots. One of the most remarkable marbles is the *lumachelle*, or fire marble, which is a dark brown shell marble, having a curious effect upon light, emitting a number of *chatoyant* or fire-like reflections.

John F. Böttger.

Before the process of making the artificial Sèvres china was brought to any degree of perfection, and long indeed before the factory where it was first made was transferred to Sèvres, the secret of making true Oriental porcelain was discovered. The inventor was John Frederick Böttcher or Böttger, whose father, having initiated him into the mysteries of alchemy, believed that he could make gold. During his stay at Zorn, near Berlin, where he was engaged in learning the profession of an apothecary, he acquired a sort of consideration in the eyes of Frederic William I., King of Prussia, in consequence of his belief that he could really make gold; but fearing that this consideration would lead the king to extort his secret, he fled into Saxony, where he travelled about for nearly three years, during which time he was pursued by agents of the King of Prussia, who finally arrested him. Owing to the interference of Frederic Augustus, Elector of Saxony and King of Poland, he was liberated, but only in name, for the latter wished to have the secret himself, and accordingly placed him under surveillance at Dresden, directing him to work at his gold-making in the laboratory of one Ehrenfried Walther von Tschirnhaus, who had made several attempts at imitating Oriental porcelain by the same means which, in the hands of Réaumur, eventuated

in the production of the celebrated *pâte tendre* of Sèvres. It is unnecessary to say that he did not make the gold; but a red clay furnished by Tschirnhaus, from near Meissen, for the manufacture of his crucibles led him on the way of discovering porcelain. With this clay, in fact, he produced a sort of ware which, although not translucent, as real porcelain would be, was nevertheless of remarkable quality. In order to satisfy the Elector for his failure in gold-making, he communicated to him his hopes of discovering porcelain, and the prince, in order not to excite public curiosity by Böttger's researches, gave the latter a laboratory and workmen in the palace of Meissen. Here he was treated with great consideration, being even provided with a carriage to go to Dresden when he pleased, but always accompanied by an officer. In 1706 Charles XII. of Sweden entered Saxony, and the Elector, fearing that Böttger would escape with his secrets, had him conveyed with Tschirnhaus and three of his workmen to the fortress of Königstein, where a laboratory was fitted up for him. He remained there a year; although well treated, he did not admire his captivity, and he and his companions planned an escape. In 1707 he was brought back to Dresden, where he continued his researches to find a porcelain like that of China. At that period hair-powder was largely employed all over Europe. This powder, as is well known, was made of starch, but an iron-master of the name of Schnorr, travelling on horseback near Aue, in the Erzgebirge, found that the feet of his horse sunk in a clay of a beautiful white colour, and it struck him that it would afford a cheap substitute for hair-powder; he accordingly introduced it into commerce. It happened one day, in the height of Böttger's difficulties to find a white clay, that his valet employed Schnorr's earth to powder his wig. Böttger observed it to be particularly heavy, and on inquiring of his valet the cause, learned that it was a white earth. He at once tried it, and to his great joy produced a true, hard porcelain. In 1709 the discovery was made, and a factory was immediately erected at Albrechtsburgh, near Meissen, which was a real fortress, provided with a drawbridge and garrison, into which no strangers were admitted; even the workmen were sworn to retain the secret even to the tomb (*"geheim bis ins Grab"*), words which were inscribed on all the doors of the workshops, and solemnly repeated once every month to the officers. A ludicrous instance of this secrecy occurred even as late as 1812. At the instance of Napoleon, the King of Saxony permitted M. Brongniart, director of the Sèvres porcelain factory, to enter the Meissen works, and to have the processes explained to him by M. Steineau, the director, who was obliged to be first formally dispensed from his oath. M. Brongniart's only travelling companion was not permitted to enter. As happens in all such cases, the secret did get out, and very soon spread into many countries.

The Practice of Sketching.

Originality and skill in inventing or telling a story, and in expressing the passions, depend, like everything else in art, on a painter's powers of observation, and the difference between the greater or lesser painter results very much from this—that he first thinks of his art everywhere and at all times, the last in his painting-room only and at set hours. Hogarth, describing his own habits, says, "Be where I would, while my eyes were open I was continually at my studies, and acquiring something useful to my profession;" and Stothard's sketch-books were filled with groups of figures and scenery made without selection, but merely of what chance offered to his notice while travelling; sometimes objects which the window of an inn presented while horses were changing, and sometimes what he saw from the top of a stage-coach. Students should be assured that the practice of redeeming spare moments of time by sketching whatever is thrown in their way is an invaluable one. Those who adopt it will be sure to be rewarded by often finding memoranda so made of far greater interest than they had imagined; and it will correct the habit, always fatal to originality, of going to nature for things only that resemble what they have seen in art. Among the drawings by Raphael collected by Sir Thomas Lawrence were many evidently of what chance presented to him. One in particular was singularly elegant, of three or four young men in the dress of his time sitting at a table, and their attitudes but very slightly varied—an accidental group, in all probability, of his pupils. In the works of Michel Angelo we meet with very many attitudes that bear the stamp of being adopted immediately from nature; and, indeed, most of the noble range of his prophets and sibyls have this look. A subject happily adopted from nature should not deprive the painter of the credit due to invention, for indeed the mere faculty of inventing an incident is far more common than the nice and quick perception of that in nature which is fitted to the purposes of art, and which ordinary observers would pass by, or reject perhaps as trifling or unworthy. Burns turned up a mouse with his plough, and was heard to say by a man who was at work with him, "I'll make that mouse immortal." And he kept his word.

NOTES AND COMMENTS

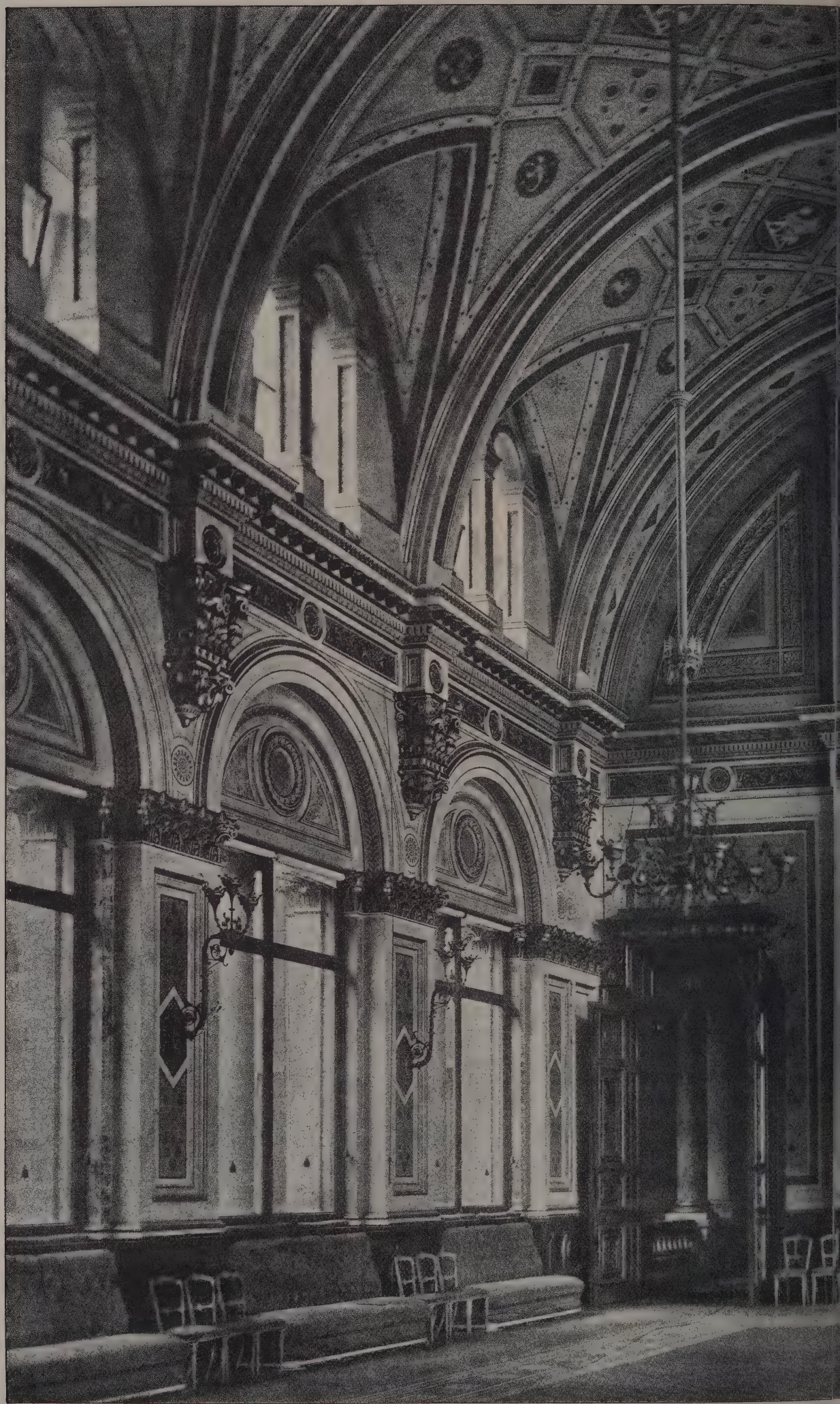
ENTHUSIASTS for the doctrine of progress very often utilise the statistics of deaths as affording evidence of the superiority of the present age over its predecessors. There can be little doubt that living in society is less dangerous than formerly, but the degree of safety is not so easily ascertained as sanitarians imagine. Scales, as it were, have to be employed which are not graduated with equal accuracy, and in consequence errors are inevitable. The consequences of the fallacy of conclusions drawn from the death-rate have been pointed out by Dr. KELLY, the medical officer of health for West Sussex. For example, the bills of mortality for the City of London from 1593 to 1657 showed, though officers were unable to calculate the death-rate from ignorance of the number of inhabitants, that the death-rate in London was very much higher than the birth-rate. Hence it was commonly said that the death-rate in the seventeenth century was 80 per 1,000, in the eighteenth century 60 per 1,000, and in the nineteenth century 22 per 1,000. But with a death-rate of 80 in 1,000 the country must have been very soon depopulated. Fortunately the death and birth statistics of Tiverton, in Devonshire, from 1560 to 1664 were also preserved, from which it might be assumed that the death-rate in Tiverton was not more than 30 per 1,000, so that they must have had in rural England in those times a very healthy state of things. Again, they had the birth and death statistics for Cranbrook, in Kent, from 1550 to 1649, where the rate of births and deaths was much the same as in the present day. An excessive proportion of young people in a district might lower the death-rate. Suppose a population of 500, with a mean death-rate of 14, is taken, the ordinary number of deaths would be seven; but suppose a large school of 500 boys was added, the additional deaths would probably only be two, so that the annual death-rate for the place would be reduced to nine, a reduction not brought about by the action of any sanitary authorities, but by accidental circumstances of population. Suppose the same parish, instead of a school, had a union workhouse with 500 inmates, the additional deaths would probably be 45 in number, raising the death-rate to 52 per 1,000. The only safe way of comparing death-rates according to population is to take from the Registrar-General's returns the deaths at each age, and compare them with the deaths at each age in the different districts.

WHEN Mr. RUSKIN wrote about the Venetian temple, with its "pillars of variegated stones, jasper and porphyry, and deep green serpentine spotted with flakes of snow, and marbles, that half refuse and half yield to the sunshine, CLEOPATRA-like, their bluest veins to kiss," how commonplace the walls of English buildings appear in contrast! Marble was supposed to be almost unattainable among us, and canons of art were laid down by which architects were enjoined to use it most sparingly in order to suggest its preciousness. The illustrations of some of the works on which Messrs. J. & H. PATTERSON, of Manchester, were employed, suggest what is now available by their enterprise. Without involving architects or their clients in extraordinary expense, they have been able to introduce a variety of marbles, not only in public buildings like the Sheffield Town Hall, but in banks, hotels, churches and private residences. In no other way could so much dignity be imparted to an interior at a moderate outlay of money, and in these days when sanitation is supreme by no other material could so much cleanliness and immunity from noxious germs be ensured. Besides (to take two of the buildings) who can calculate the refining influence which walls of St. Sylvester and columns of brocatella must exercise on the humble customers of the Yorkshire Penny Bank, or what delight the combination of Kerry and Galway marbles with alabaster, rouge fleuri, and rouge griotte may afford the poor but imaginative Irish of Bootle when they look on so much natural colour in their Marsh Lane Church, that is assuming the marble is kept clear from trumpery decoration and paper flowers? We have seen some of the buildings which Messrs. PATTERSON have adorned with their marbles, and can testify to the excellence and refinement of their carven work and the fine taste shown in the selection of marbles in order to produce the most harmonious effects. They have helped to dispel

the absurd notion that in England there is fear of colour, and have demonstrated that our dull stones and bricks may be veiled with the most beautiful of building materials, without committing treason against the goddess of economy who so severely watches our estimates and tenders.

THE annual report of the Chetham Society refers to the publications of 1894-95, viz. Sir STEPHEN GLYNNE'S "Notes on the Churches of Cheshire," edited by Canon ATKINSON, and the "Notebook of the Rev. Thomas Jolly," edited by Colonel FISHWICK. The "Notes on the Churches of Cheshire" are of the same character as those on the Lancashire churches, which form one of the volumes of the Society for 1891-92. They give descriptions of churches made by Sir STEPHEN GLYNNE between 1832 and 1864, and include many details which the hand of the so-called restorer has since destroyed, and which are nowhere else to be found recorded; while the notes of the editor add much of interest, especially a careful description in each case of the communion-plate and bells. The "Notebook of the Rev. Thomas Jolly, 1671-93," forms, as the editor states in his preface, "an interesting addition to the diaries of ADAM MARTINDALE and HENRY NEWCOME, and not only illustrates a period of our local history concerning which materials are by no means plentiful," but it also illustrates in a remarkable degree the least favourable side of Puritanism. The editor has prefixed a history of the JOLLY family, which, as well as the volume generally, contains much matter of interest to Lancashire genealogists. The printing of the third part of "Byrom's Poems," edited by Dr. WARD, is completed, and that of the fourth part, concluding the poems, and containing extracts from the commonplace book, is well advanced. Both parts will be issued in the course of the next few months. A full index to the four parts is being made by Mr. FRANCIS M. JACKSON. A competent editor has been found for the "Visitationes exemptæ jurisdictionis Abbatis et Conventus Beate Mariæ Virginis de Whalley," in Miss ALICE M. COOKE, M.A., late Jones Fellow of the Owens College and now Assistant Lecturer in History there. Some years since the President mentioned at the annual meeting of the Society the "Account-book of Sir Nicholas Shireburn," the last of that family who owned and occupied Stonyhurst, as being in the possession of Mr. WELD-BLUNDELL, of Lulworth, the present representative of the Shireburns. Since that time three other volumes of the "Account-books" have been discovered at Stonyhurst. The Rev. JOHN GERARD, S.J., the author of the "History of Stonyhurst," published last year, has undertaken to edit a selection from them, which cannot fail to prove of much interest, relating as they do to a period when Lancashire probably possessed a greater number of Roman Catholic gentry than any other county. These "Account-books" deal with the earlier years of the eighteenth century. The following works are also in progress:—"The Minutes of the Bury and Bolton Presbyterian Classes," by W. A. SHAW, M.A.; "The Life of Humphrey Chetham," by Mr. C. W. SUTTON; "The Lancashire Recusants of 1716: Being a True List of the Names of those convicted as Popish Recusants at the several Quarter Sessions within the County Palatine of Lancaster," by Mr. JOSEPH GILLOW; "History of the Chapelry of Newton," by Rev. ERNEST F. LETTS, M.A.; "History of the Chapelry of Stretford," by Mr. H. T. CROFTON.

THE pocket-books of formulæ and memoranda introduced by Messrs. SPON have made many professional men the debtors of the publishers, for they are the most serviceable epitomes of experience in existence. The latest addition is one on "Calculations in Stresses, &c.," by Mr. E. MONSON GEORGE. As a rule, treatises on the subject have to be printed on paper of a large size, especially if graphic methods are expounded. In this case the pages are only of the "Molesworth" dimensions, but by means of precise diagrams and compressed instructions the process of ascertaining the dimensions of the types of girders in general use is amply explained. It is not always possible to work out moments or arrange diagrams at will, and most books relating to them are not portable. Mr. MONSON GEORGE's pages will afford hints in such cases, and a copy will add little to the weight of "Molesworth" or "Hurst." It is a veritable *multum in parvo*, and wherever girders are designed it should be seen.



PHOTOGRAPHED BY BERFORD LEMERE & CO

THE BALL ROOM: HOME OF
The Late SIR GILBERT



COLONIAL OFFICES, WHITEHALL.
COTT, R.A., Architect.



Syd Newcombe 1895
del

• Richmond • Secondary • School
• Selected •

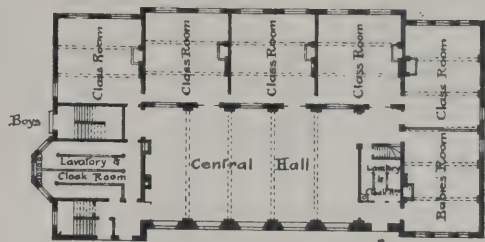
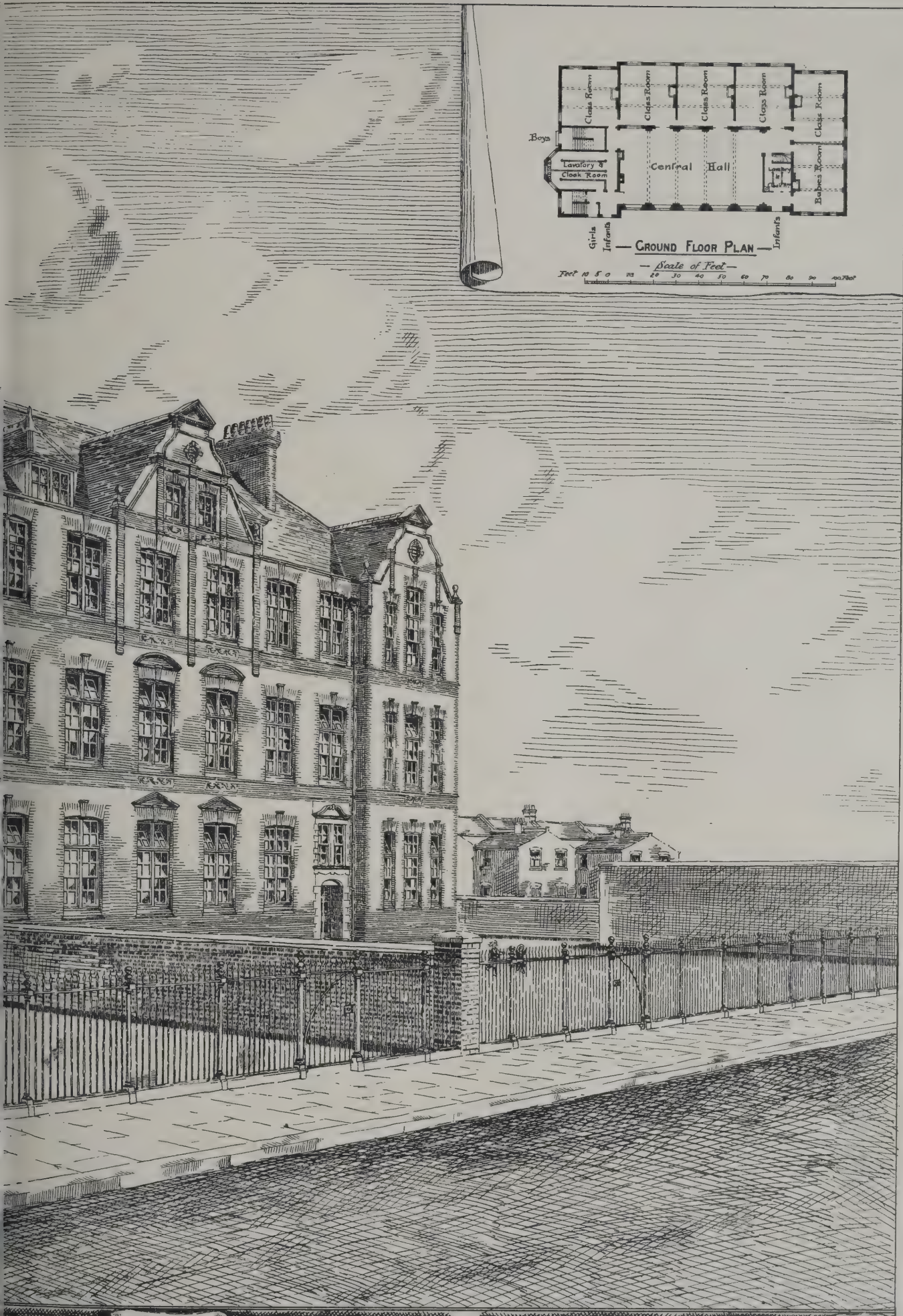


of • and • Technical • Institute •
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• Hyer & Bath •
 Architects
 • Green • Anne • Mansions
 Westminster • S.W.



Trumpington Road Board School



— GROUND FLOOR PLAN —
— Scale of Feet —
Feet 10 5 0 10 20 30 40 50 60 70 80 90 100 Feet

ools

• WANSTEAD •

John T. Bressey Architect

ILLUSTRATIONS.

THE BILL-ROOM, HOME AND COLONIAL OFFICES, WHITEHALL.

SECONDARY SCHOOLS AND TECHNICAL INSTITUTE, RICHMOND,
OR THE SURREY COUNTY COUNCIL.

WE illustrate the selected design submitted under motto "Labor et Spes," by Messrs. FRYER & BATH, architects, Westminster and Richmond. Eleven sets of plans were sent in and adjudicated upon by the county surveyor. The selected plan was unanimously adopted by the Surrey County Council and the Richmond Technical Instruction Committee. The buildings will occupy a prominent site on the Kew Road at the corner of Selwyn Avenue. The plan provides for a large hall at the corner of Selwyn Avenue capable of accommodating 300 persons, behind which will be a classroom for dress-cutting, and provision for cookery classes, with a separate entrance for the women attending the classes; while a large corridor will separate this building from the hall, and so prevent any annoyance or disturbance to classes in the hall. This wing of the building, however, will not be erected at present, owing to lack of funds. The opposite wing will contain a classroom 60 feet by 25 feet, which will at present be used as a hall, and is divisible into three smaller rooms by means of movable partitions. In the main building on the ground floor there will be two large classrooms, several smaller rooms, and accommodation for the head master. Behind the large classroom will be a well-equipped chemical laboratory and balance-room. On the first floor is the art school, 40 feet by 25 feet, with an art classroom adjoining and an art master's room attached. On the same floor are other classrooms and the caretaker's apartments. There are large basements which will also be utilised. The building will be heated by hot-water radiators and boiler-room; ventilation will be specially provided for; and one of the best features in the plan is the admirable arrangement for lighting, especially in the art rooms, where there are both windows and skylights.

Tenders have been invited for the erection of the buildings, the lowest being that of Mr. T. W. BROOKING, of Richmond, for 6,868*l.*, which, with certain modifications, has been accepted by the Surrey County Council.

TRUMPINGTON ROAD BOARD SCHOOL.

THIS school, standing in the Wanstead School Board district, and providing accommodation for 1,200 children, was opened on February 9, 1894. The building is planned with a large central hall on each floor, from which all the schoolrooms and classrooms open. The staircases are placed on each side of the mezzanines containing the lavatories and teachers' rooms, and are so arranged that both flights are available from either of the upper floors in case of need. The teachers' rooms, which are of exceptional size (26 feet by 16 feet 6 inches), have on each floor bay windows overlooking the halls of their respective departments, as well as bay windows commanding the playgrounds. Externally the school has a plinth of red Stafford bricks up to the ground-floor cill level, and above this the facings are of picked stocks with red brick bands, dressings and moulded courses. Portland stone is used for the doorways and copings. Internally the building on each floor is faced with a brown salt-glazed brick dado, 4 feet 6 inches high, and above this with white Suffolk bricks. The staircases, 4 feet 6 inches wide, are of patent Victoria stone.

The builders were Messrs. A. REED & SON, of Burford Road, Stratford, E., and the total cost of the buildings, including the installation of a heating apparatus, was 13,309*l.* The heating was carried out by Messrs. C. P. KINNELL & Co., of 65 and 65A Southwark Street, S.E. Mr. JOHN T. BRESSEY is the architect.

The Visitors to most of the museums and galleries in London on Monday were fewer in numbers than on Whit-Monday in 1894. At the British Museum there were 2,593 against 3,522; at the National Gallery 5,500 against 7,082; at South Kensington 11,751 against 14,293.

HISTORY OF SILK PATTERN DESIGNING.*

I HOPE it will not be considered too great a divergence from my subject if I attempt a very brief outline of the history of silk pattern designing. It is not necessary to be more than brief, because Mr. Paul Schulze, in this room in April last year but one, treated this subject very learnedly, and his largely-illustrated paper was published in the "Journal" (vol. xli. p. 534). He commenced by telling us of Egyptian ornament of several ancient dynasties, and of Assyria; then of Greece, in which animals formed the most prominent features, and of Roman-patterned textiles. That time was followed by the interesting patterning of the ancient Egyptian Christians, found by Mr. Flinders Petrie upon the clothing of the dead in the Coptic tombs of Upper Egypt, on which garments, men, women and the lower animals and symbols were represented in storeyed sequence so far back as the third and several later centuries. Persian silk weaving at this time was in the ascendant—that is, in the sixth century of our present era. Here is an example which is a reproduction of a reliquary cover from the church of St. Servatius of Maestricht. It is a piece of Persian figure-weaving of the sixth century, made under the government of the reigning family of the Sassanide kings. Its meaning is a hunting-scene, in which two Persian kings on horseback, hunting lions, take part. Between the circles are woven the Tree of Life, the Hom of the ancient Assyrians. This will serve as a type of Persian textile patterning, and to fitly exemplify this rapid sketch of the evolution of textile ornamentation, and to show that the chief thought in the minds of those who made the patterns was the expression of some motive and of some meaning. From this period patterning merged into the Byzantine treatment of ornament, which influenced this branch of art from the sixth to the thirteenth century. The use of the lion was prevalent in allusion to the royal lion of the tribe of Judah representing our Saviour, and of other meanings.

Here is a Byzantine illustration of another kind. It is a *facsimile* reproduction of the patterning of the garment in which the German emperor Otho the Great was buried in A.D. 973. I possess a small portion of the original stuff, which is of silk. The period of the decline and decay of Byzantine art brings us to the art of the Mohammedans and to their power of conquest, which made them masters of Byzantium (now Constantinople), and with it Turkey, in 1453. The Saracens, an Arab race, the first disciples of Mohammed, became masters of Spain in 711 and Sicily in 832, where they established their Saracenic arts, notably those of silk weaving and dyeing. The Normans conquered Sicily after this period, and in the twelfth century Roger II. gave encouragement to the cultivation of silkworms and to silk weaving. He established at Palermo a royal silk factory called Hôtel de Tiraz, a portion of the royal palace of the Saracens of the ninth and tenth centuries. Roger employed both Saracenic and Greek weavers, and the evolution of designing received a great impetus; it is represented by the symbolic animals and drawings shown in the lithographs on the wall, from valuable old textiles now preserved in churches and museums. It was at this period that symbolic designing reached its highest development. For example, this drawing of a lion seizing a duck, representing government, and pursued by an eagle, meaning good luck and riches. The lion and hoopoe signify wisdom. Here is one of two stags kneeling under the sun's disc, from which radiate sunbeams yielding dewdrops. This refers to the verse in the psalm, "As the hart pants for cooling streams, so longs my soul for Thee, O God."

From Sicily the art travelled to Lucca, Milan, Florence, Bologna, Venice and Genoa, and up to the dawn of the fourteenth century the designs were but modifications of Saracenic creative talent, but yet always having meaning.

Here is a reproduction of one, probably from Lucca looms. It possesses great beauty, both in motive and in drawing. Mr. Schulze thus describes it:—"The dog, the symbol of the human soul, has been freed from this mortal life, as indicated by the broken chain; the eagle, the symbol of divinity, having descended from heaven to break the chain, now steers the soul to the abode of the blessed, and this action takes place under the shade of the great and mighty tree of the Church. This design was probably made for funerals."

From this time, or during the whole of the fourteenth century, came gradually in the splendid pattern designing of the Italian Renaissance, the close of which may be considered contemporaneous with Raphael and Michel Angelo, or (say) of the middle of the sixteenth century. There are some patterns from Crivelli's pictures in the National Gallery, copied by Mr. Sidney Vacher. They have such a family resemblance to each other as to point very distinctly to Crivelli's skill as a pattern

* From a paper "On the Improvements in the Designing, Colouring and Manufacture of British Silks since the Egeiton Exhibition of 1890," read by Mr. Thomas Wardle before the Applied Art Section of the Society of Arts.

designer. The influence continued onwards to the time of Paolo Veronese, or nearly to the end of the century.

The liking for the representations of animals in woven fabrics had, during this time, gradually given way to very conventional treatment of foliage, fruit and flowers, in formal diaper work, with much Gothic influence. It was never naturalistic. By the end of the fourteenth century animal representations had disappeared, the pomegranate, the symbol of Christian love, and the pineapple having gradually supplanted them. These fruits became through the fifteenth century the characteristic features in the ornamentation of the silken stuffs for both official and domestic dress, and for the ornamentation of churches and houses.

A very interesting development of the pomegranate pattern appears about the end of the fifteenth century. Broad, ornamented stems take an undulating upward course, and on either side branches bearing roses, blossoms, leaves and little pomegranates and crowns are disposed. They were the fashion of the Burgundian court in the latter part of the fifteenth century, where the use of an immense mass of material made the employment of these gigantic patterns possible.

The sixteenth century saw a great change in pattern designing. The previous evolution having been first of a religious expression, which became more decidedly Christian in meaning, was now succeeded by patterns of a more secular kind, and frequently they possess little or no meaning. This I incline to think was owing to the spread of the silk industry into France and Flanders, and away from the immediate art and religious influences of Italy. The vase took its place in the pomegranate pattern; then, owing to the cut-up forms of dress consequent in changes of fashion, the large designs disappeared, and smaller floral ones, still conventional and fragmentary, took their place.

The Reformation in the early part of the sixteenth century also influenced pattern designing, and especially colouring, to more subdued and less ornate effects. Probably the old designs having so much religious meaning were unhappily discontinued because of their association with the excesses of dogma and ceremonial of the papacy, and pattern designing lost all its dignity and much of its art perception. The designs obtained and deserved the epithets "baroque" and "rococo," and gradually became distinguished for a superfluity of confused and discordant detail, as may be seen in some of these fabrics of Louis XV. (1715-74).

For the first time realism in the drawing of floral subjects crept gradually in; it has influenced French designing down to the present day for the worse, and has now become the rule, and not, as in the early part of the seventeenth century, the exception.

Since the days of the Renaissance in Italy and Spain there has been only one great influence in fabric pattern designing, that of the French, and we may begin with it where the Renaissance practically ended, say from about 1600. The dignity of the old patterns gradually fell into more or less meaningless and commonplace treatment. I shall illustrate this by typical examples of old fabrics and drawings.

First, the patterns of the time of Henri IV. (1589-1610), the English equivalent of which is the time of Elizabeth (1588-1603).

There are two patterns of her time on the wall; one is a portion of silk from one of her own dresses, lent to me by Mrs. Lomax of Lichfield, the other a more ceremonial and dignified pattern of a dress which she is wearing at her devotion. It is taken from a frontispiece of a reprint of an ancient prayer-book, and illustrates the laudable fashion of wearing large patterns. It will be noticed that this pattern is so large that in its length it does not repeat what belongs to the patterns of the late Italian Renaissance.

The characteristic treatment of the Henri IV. period for stuffs is shown in the drawing of a beautifully-coloured Lyons velvet of this period. This pattern will evidence the disregard for construction and symmetrical arrangement, and with the others will suffice to show the leading up to the "baroque" character of the rococo period, which culminated in the reign of Louis XV.

Lace manufacture became a very important one in France in the latter half of the seventeenth century, and the silk designers of Lyons were soon influenced to imitate lace effects in their patterns for brocades, so in many of them one is constantly reminded of Argenteuil lace patterning, and of more recent forms. Lace was at this time much used to enrich the ornamentation of gentlemen's coats and vests, and the imitation of it in the loom was one of easy transition, and its influence continued down to the Empire. The culmination of ornamental forms and devices occurred in the reign of Louis XV. Every imaginable idea was brought under requisition and with great skill. Even Chinese ornamentation was largely laid under contribution. Mr. Schulze's words are:—"Flowers and leaves are rendered with the full effect of light and shade, and the natural colours of the flowers are imitated. The rose is used for choice, but fruit also, cherries and plums—in fact, a profuse

flora in all possible fantastic forms, together with parts of architecture, cascades, shells, rocks, &c., served as models for the textile patterns of this time."

In the time of Louis XVI. the drawing became still more fanciful and naturalistic, the patterns smaller and accompanied by striped grounds, plain and coloured. Again, in Mr. Schulze's words:—"These small patterns are intermingled with a variety of hunting, fishing, music, and such like symbols; fluttering ribbons, festoons, fruit baskets, &c., appear in the intervening spaces. They are the reflection of a period when ruin was approaching, and when no energetic effort was possible. The designs on the textiles are a faithful mirror of the trivial social life of that time." But this state of things did not last for long. Probably in consequence of the excavations at Herculaneum and Pompeii motives were furnished for woven designs, which were taken from the wall-paintings of classic antiquity. They bring us, after the desolation which the French Revolution in 1789 spread over art, science, industry and trade, to the style of the first French Empire, which found its opportunity in the imitation of the antique, or in a new but weaker renaissance.

Since these periods the art of textile designing in France has been a play upon them, and in many cases a direct imitation of them. I fear it cannot be said that any healthy influence or originality has resulted during the last seventy years of French designing. In my opinion it has gradually retrograded until, as a rule, it has become burdened with the merest trivialities, commonplace treatments, and eccentricities of form. Large and dignified patterns have, unfortunately, given way to small ones, for the most part in every conceivable state of art degradation.

In colour the French are always clever, and it must be conceded that, as a nation, they possess great taste in that respect. They make poor designs look attractive.

The more classical forms of decoration of the Empire period are not yet without their baneful influences and admirers, although the taste for the styles of Louis XV. and the Empire is visibly declining in England, under the healthier influences of Anglican effort and the cultivation of a more imaginative or ideal style of patterning, in lieu of the worn-to-death posy-groups of pretty flowers, which are often below the drawing capabilities of a schoolgirl.

It can now no longer be said that we in England are deficient in designing power. Whilst decorative design has degenerated abroad it has, through the advantages offered by South Kensington, and from other indigenous influences in all parts of the country, greatly developed, so much so that our designers have now attained a high degree of excellence, and are sought for from outside the country.

The reasons which actuated me in selecting a date no further back than 1890 from which to review improvements were that it was the year when several of us felt that it was time public attention was called to the fact that the silk industry of this country was fast losing ground, and was threatened with extinction, and that the late Lady Egerton of Tatton, whose interest in the industry chiefly arose from her home being so near Macclesfield, also thought that, before any serious attempt was made by English ladies to advocate the wearing and other uses of British silks, it would be well to have an exhibition of the denominations of silk in which our manufacturers excelled, and that the exhibition would also be very useful as recording the then state of styles and colourings of home-manufactured silks.

That exhibition took place, and in spite of a number of silks of excellence, there was a consensus of opinion that in many respects, especially in dress silks, the exhibition was not a success, and that ladies could only accord a preference to British silks in proportion to such an advancement of art, both in design and in colouring, as should show real progress in the immediate future.

In season and out of season since then the necessity for artistic progress has been preached to manufacturers, and the result has certainly been surprising. There has been an increase of able designers, and a careful study of the history and evolution of patterned textiles on all sides. The schools of art have become more in touch with the silk industries in which they are placed, and, as this collection illustrates, British and Irish manufacturers are no longer nervous or ashamed of proclaiming to the world that their products are worthy the attention of the wearers and users of silk, and especially of those of them who are known to possess the highest culture and taste.

Most fortunately for the industry, that wealthy and powerful body of gentlemen who constitute the channels of distribution have, for the most part, given in their patriotic adhesion to the movement for the restoration of British silks to their old places of pride, and are satisfied that there is inherent capacity in our manufacturers to satisfy in the near future, if not entirely at the present moment, their requirements; and they are, I know, zealously helping forward the movement with much determination and at some temporary sacrifice.

The collection now before you can speak in more eloquent

language than mine, and I desire to say but little about it this afternoon in order that more time may be given for a thorough inspection of the silks now exhibited. It is an object-lesson which will be best taught by self-description. What is, I think, worthy of observation, is a lessening dependence upon continental styles and patterns, and the more English and less French treatment of both patterning and colouring.

The existence of an English school of colouring, which is represented by the leading painters of our time, does not render it necessary for any students to go abroad for inspirations in that respect; and I think the refined and harmonious colourings which characterise the silks in this collection will convince every one here that the exercise of a purer and higher taste is conspicuously greater to-day than at the exhibition of 1890.

There is also now a happy union of thought and effort between distributor and manufacturer. There are gentlemen of unquestionable taste and artistic perception amongst the distributors who know but little of the technicalities of manufacture, just as there are manufacturers of the greatest possible technical skill who are not equally alive to the artistic progress of the times and to the taste and requirements of the distributor, and so when both combine to produce a desired effect, the result is much more satisfactory.

Sir George Birdwood said he entirely concurred in Mr. Wardle's condemnation of the influence of Japanese art on English decorative designs. He was aware of being deeply prejudiced against the conventional applied art of Japan, but he spoke now not from his prejudice but from the facts of history. The vogue of Japanese art in France during the reign of Louis XIV. developed the rococo style of art which prevailed throughout Europe during the reign of Louis XV.; and the revived influence of Japanese art in Europe since the publication, in 1863, of Sir Rutherford Alcock's "Japan," is the obvious cause of the degradation, and he would say depravity, of taste which has obtruded itself in so many departments of English artistic activity in recent years, and which, it would be as well to emphasise, in connection with Mr. Wardle's paper, was particularly apparent and repellent in the aggravated absurdities of the female fashions of the day.

THE NIGG CROSS SLAB.

A FITTING companion to the Ruthwell Cross from Dumfriesshire in the Edinburgh Museum of Science and Art has now been found in the Ross-shire Cross Slab from Nigg. These stones, says the *Scotsman*, not only represent two entirely different styles of art, but they are memorials of two important religious bodies, who, each in their own way, did much for the making of England, and who met and parted at a great crisis in its history. It was between the Celtic and the Anglo-Roman Churches that the first great religious controversy in this country took place. The Ruthwell Cross is an Anglo-Roman monument. It represents the Anglian party who adhered to Rome. The Nigg Slab, on the other hand, shows us the art of the Nonconformist Celtic missionaries who "went out" from Northumbria 1200 years ago and carried with them to Scotland, or rather to the Highlands of Scotland, the first seeds of ecclesiastical controversy.

In November of last year, Sir R. Murdoch Smith, having made the necessary arrangements with the Rev. Mr. Fraser, minister of the parish, *formatori* were sent from the Edinburgh Museum to mould the Celtic cross slab, which now stands in the churchyard at Nigg. The weather, fortunately, was favourable; the mould was successfully made, and three casts were taken from it—one to Edinburgh, the others for South Kensington and Dublin. The cast now set up in the Museum, Edinburgh, reproduces exactly the weathered carvings and sculpture, and has been coloured in close imitation of the old red sandstone of the original. The Nigg Cross Slab, the most perfect both in design and preservation of the Ross-shire monuments, is probably also the finest of the 300 or thereby Celtic stones which are known still to exist. Unlike the inscribed Ruthwell Cross, the Nigg Slab bears no word or letter to tell its purpose or to suggest its age. There has, however, gathered round it a tradition which it shares with two other neighbouring monuments. These are known as the Shandwick Stone and the Hilton Stone, and were, says the tale, erected as memorials of three sons of a Danish king who were found drowned on the shore near by. The tradition, as Hugh Miller has preserved it in his "Scenes and Legends of the North," tells that a Maormer of Ross married a daughter of the Danish king, but, proving an unkind husband, the lady contrived to escape to her father, who fitted out a fleet and army and set sail to avenge on the Maormer the cruelties inflicted on his daughter. The king took his three sons with him, but on nearing the Scottish coast a terrible storm arose in which most of the ships were wrecked and the three princes were drowned. The ledge of rock on which this disaster is said to have taken place still bears the name of the king's

sons; a magnificent cave which opens among the cliffs on the adjoining shore is still known as the King's Cave, and a path that winds to the summit of the precipice beside it as the King's Path. The bodies of the princes, says the tradition, were buried, one at Shandwick, one at Hilton and one at Nigg, and the sculptured slabs at these places are said to have been erected to their memory by their father. Whatever may be the event that these stones commemorate, the character of the ornament on the Nigg Cross slab fixes its date at not later than the ninth, or possibly the eighth century, A.D. It would thus be nearly contemporaneous with the Ruthwell Cross, and a comparison of these monuments in the museum brings out more clearly the characteristics of each. The Nigg stone, from Ross-shire, may be taken as representative of the art of that portion of the Celtic area which lies along the eastern coast of Scotland north of the Firth of Forth—the spot of earth on which alone such remains of purely Celtic art are to be found. It is a Christian monument raised among the Celtic community, a community, however, which differed so strongly from the churchmen of Northumbria that each party looked on the other as rank schismatics.

The Ruthwell Cross, on the other hand, is a monument of the Anglian Church. It comes from the time when the North Humberland extended to the Firth of Forth, and Eadwine's-burh was Northumbria's northern outpost. There is nothing Celtic about the Ruthwell Cross. Its ornament of foliaceous scrolls, intertwined with birds and beasts, its Latin inscriptions cut in Roman letters, its figure sculpture, all suggest that the forms and traditions of work were borrowed from Gaul or the farther south. But it is not in these that the main interest of the monument lies. These were the common property of Christendom, and as old as Christianity itself. The interest and importance of the monument is rather to be found in the fact that side by side with these old-world things of Rome there is inscribed upon the stone a new song of the Cross, an Anglian "Vision of the Holy Rood," written in the northern measure of a Viking's chant and cut in the letters of a language that Rome never knew. The English art, the English religion are thus, so to speak, grafted on the Roman stem; and though this connection may appear somewhat fanciful, it gains significance from the history of the time when the monument was raised. The date must be shortly after the memorable Synod of Whitby, A.D. 664, when Northumbria severed its connection with the Celtic missionary church, which till then had been the only church of the North. King Oswin's decision was of vital importance to the future England. The choice lay between an adherence to the Irish Celtic Church and a connection with Rome. The Celtic Church had for a long time been cut off from the rest of Christendom, an isolated body differing on points of government from the church of the Continent. If Northumbria adhered to it, she must have shared its isolation, and have cut herself off, not only from Rome, but also from spiritual communion with the rest of England. But Rome, though fallen from its former greatness, still possessed the traditions of civilisation, of literature, of law and of art. "To fight against Rome," said one of the leaders of the time, "is to fight against the world;" and Northumbria, by adopting the communion which had been maintained unbroken at Canterbury since the days of Augustine, not only united the whole of Christian England, from the Channel to the Firth of Forth, in obedience to Rome, but took the first great step towards that union of England and Englishmen under one king which was completed two centuries later.

The defeated Celtic Church, thus dismissed and supplanted, shook the dust of Northumbria from off their feet, and, led by Bishop Colman, departed to Hii, the modern Iona. Even there it is not certain that they had rest. The Roman influence followed them. In discussions on the rival doctrines and forms of worship the Roman party were again victorious. The Roman ritual was adopted, and, following in its wake, the Romanesque influence appears in the art of the sculptured stones of the West Highlands. It is probable that only on the eastern half of Scotland the missionary Celts at last found rest. There they worked and preached and civilised as they or their fathers had done before in Northumbria, and left behind them those monuments of pure Celtic art of which the Nigg Cross is a typical example.

The slab now measures 7 feet 4 inches high by 3 feet 5 inches broad, and is rather more than 5 inches thick. The sides are nearly parallel for a height of 6 feet; they then slope inwards to form a gable-shaped top, in which the principal figure-subject is sculptured. When entire the monument must have measured about 14 inches higher than at present, but it was thrown down during a gale in 1787, and broken in two pieces. When seen by Mr. C. C. Petley, who visited Nigg in 1811, the one portion was lying in the churchyard, and the other had been thrown over the churchyard wall. Fortunately Mr. Petley made drawings of the two fragments, and from these drawings it is possible to restore the parts which have been broken off and destroyed since his visit. This priceless monument, which thus so narrowly escaped destruction, has now

fallen upon happier times. Its pieces have been carefully fitted together, and the whole slab has been set on a solid foundation specially built for it adjoining the vestry of the church.

The general plan of the decoration of the slab is similar to that seen on many of the decorated pages of Celtic manuscripts. The surface of the obverse is divided by panels which are so arranged as to form in the centre a cross, the shaft of which extends to the bottom of the slab, the other panels serving as its background. The ornament is entirely different from the Romanesque forms of the Ruthwell cross. Celtic art is, so to speak, a child of the soil. Its elemental forms are so simple that they have been the playthings of every nation in its young days. The early Greek potter had little else than these frets and spirals and twisted bands with which to decorate his vessels. By-and-by he mastered the human form, and these primitive elements had to take a subsidiary place. But to the Celtic artist they are his all in all. It is true he carves many figure-subjects, but these crude productions can never be looked upon as Celtic art. It is by its ornamental forms that it must be judged, and though these are limited for the most part to the fret, the spiral and inter-lacements of varying complexity, an examination of the panels of the Nigg stone will show to what unequalled skill and to what beautiful results the Celtic artist attained. His inter-lacings twine and intertwine with a certainty and unerring accuracy that almost defies imitation; his spirals are bewildering in their complexity, yet as an ornamental pattern are clear and perfect; and even on the fret or key pattern, common to every people from Ross-shire to Peru, he stamps his individuality, and by an original treatment marks it as a Celtic form. As a rule the human figure and animals appear on these monuments only to serve the purpose of filling up spaces, without regard to proportion or artistic composition. On the reverse of the Nigg stone there is a gathering of various sculptured forms which seem to have little connection with each other. The central group, David rending the jaws of the lion, is much damaged, and would be unrecognisable save for the symbols, the harp and the sheep, which remain to tell us that the sweet singer of Israel is here represented. Below and above this group is a stag hunt in much better preservation, and showing a good deal of natural drawing and action. This subject is said to have a symbolical significance, and refers to the chase of the soul until it finds rest in the bosom of the Church. Other forms there are on these monuments which are purely symbolic, but which have defied all attempts to ascertain their meaning, and among such are the so-called elephant symbol on the Nigg slab and on the Shandwick stone, and the spectacle form and the crescent and V-shaped rods on the Hilton monument. The principal figure sculpture on the Nigg slab is scarcely less free from mystery. In the pediment-shaped top of the obverse, two figures in flowing robes, and with hair falling on their shoulders, are represented in high relief, facing each other, and bending forward toward a chalice-like form placed in the centre. Each holds a book in his hand, and seems intent on its open page. Two dogs cower below the figures, crouching low, as if awed by some supernatural power; while in the centre a dove descends, bringing in her bill the sacred wafer to complete the elements of the Eucharist. Over the group are two very conventional trees which form an enclosing border. Various attempts have been made to explain this scene. Hugh Miller suggests, among other explanations which he gives, that it may represent a treaty of peace between two rival chieftains, the book and the sacred elements adding to the sanctity of the transaction. It may be as near the mark to associate the sculpture with the historical events already referred to. The Celtic and Anglian Churches separated on a question of Easter celebration and a dispute as to the form of tonsure proper for the clergy. Here we have the untoured Celt in his northern home celebrating his most sacred rites under his own vine and fig-tree, no man making him afraid. The dogs of passion and of unrest are subdued and harmless, and behold! the worship is accepted, for the dove, the Holy Spirit, descends from on high to assist at the feast and to bless the worshippers. But mere conjecture as to the meaning of such subjects would be endless. The artistic value of Celtic monuments is in their ornament, and the Nigg slab is not only an unrivalled example of Celtic ornamentation, but to the student it is quite an epitome of the characteristic forms of Celtic art.

The Society of Architects are making a somewhat new departure by holding their next ordinary meeting in the field. The reason given, we believe, for this step is, that the summer months are entirely suitable for field excursions, and that members would welcome an opportunity to visit places of architectural and archaeological interest during that season. The forthcoming excursion to the Roman villa at Darenth inaugurates the new movement, and the address to be given by Mr. George Payne, F.S.A., on that occasion should be of great value and interest.

THE ORDNANCE SURVEY.

A REPORT of the progress of the Ordnance Survey to December 31, 1894, has just been issued as a Blue-book. It states that all cultivated districts in England and Wales, with the exception of Lancashire and Yorkshire, had been surveyed and published before March 31, 1890, on the 1-2500 scale. With regard to the resurvey of Lancashire and Yorkshire on the 1-2500 scale, all the cultivated districts, 7,293 square miles, have been surveyed. The area has all been published except 15 square miles. During the year 1,086 square miles were published. The Treasury in December 1886 sanctioned the general principle of the revision of the Ordnance maps; but, owing to the necessity of resurveying those counties of England and Scotland which had been originally surveyed on the 6-inch scale, it has only been possible to begin in 1894 the actual revision of the 1-2500 plans. All England and Wales has been published on the 6-inch scale. The uncultivated districts in Lancashire and Yorkshire, 861 square miles, have been revised on the ground. The publication of the revised 6-inch plans of Lancashire and Yorkshire is in progress. The area published is 4,891 square miles, of which 2,009 square miles were published during the year. The new series 1-inch map, based upon the 1-2500 and 6-inch surveys, is published in two forms:—1. Outline and contours. The area published is 54,121 square miles, of which 5,497 square miles were published during the year. Some delay has taken place as to the Welsh sheets, but this will not affect the time for completing the whole map, namely, 1896. 2. Hill features. The area published is 16,459 square miles, of which 1,140 square miles were published during the year. According to existing arrangements, the publication of this map will be completed in 1902.

PRESERVATION OF KARNAK.

THE honorary secretary of the Society for the Preservation of the Monuments of Ancient Egypt, Mr. Poynter, R.A., has written a further appeal for funds to complete the valuable work now being done by his Society at Karnak. Many hundreds of people must have visited the magnificent ruins at this celebrated place during the past winter, and a very moderate subscription from each would provide the small sum required to finish the work actually in hand, which is nothing less than saving the ruins from the destruction which must inevitably ensue if the water which percolates into the Karnak basin during the inundation of the Nile is allowed to stand there for many more years, working its slow but certain mischief. The project for arresting the evil effects of the inundation water is set forth in full in the last annual report of this Society. It consists, in brief, of an engine of sufficient power to pump out the water as fast as it enters the ruins, so that it is never allowed to accumulate—in short, to keep the ruins as far as possible dry—and of a drain to carry the water into the Nile. This scheme has been approved by successive officers of the Irrigation Department in Cairo, and is now in charge of Mr. W. J. Wilson, Inspector-General of Irrigation for Upper Egypt, who has sent a final report and estimate for completing the work; and it has the complete approval of Mr. W. E. Garstin, the distinguished engineer, who succeeded Sir Colin Scott-Moncrieff as Secretary of the Public Works Department.

Mr. Wilson writes from Karnak, under date of May 8:—“An eight horse-power engine and 10-inch centrifugal pump were purchased last year, and are at Karnak. A contract for the construction of the pump-well, engine-house and outfall channel has been made with M. Santamaria, a capable contractor, and the work is in progress.” The cost of the whole as estimated originally by Major R. H. Brown, and confirmed by Mr. Wilson, is 1,300*l*. Towards this amount this Society has already contributed 865*l*.; a further sum, therefore, of about 450*l*. is required. In a note attached to Mr. Wilson's report Mr. Garstin writes:—“If the balance can be at once provided the drain can be completed and in working order before the ensuing flood; if not, another year will have been lost, as once the subsoil water level rises it will be impossible to carry the excavation down to the required depth.”

Mr. Wilson further suggests the construction of some drains round three sides of the ruins, to lower the saturation level of the soil which is accumulated about the walls and columns. Towards the removal of this accumulation of soil and *débris* the Egyptian Government have appropriated for this year 1,000*l*. from the Museum Budget; but this sum will go but a little way towards removing the mounds which have grown among the ruins in the course of centuries, and as Mr. Garstin writes, “It will naturally be necessary to take in hand those portions of the monuments which appear to be in the greatest danger.” The danger arises from the saturation of this accumulated soil, which is impregnated with the salts destructive to the stone. Unless an immense sum of money can be provided at once for the removal of all the saline soil (the most moderate estimate is 30,000*l*.) it can only be done very gradually

as money is provided. Mr. Wilson's plan for checking the destructive effects of the salt in the soil is to make "deep drains, which would nearly surround the Temple of Ammon and would tail into the lake." The soil being in this way dried the salts would cease to have a deleterious action and would check decay until the whole of the soil can be removed. For these drains a further sum of 550*l.* would be necessary.

But for the present the important thing is to finish the channel to carry off the water of percolation as it rises and is pumped out. If this can be done during the ensuing season an immense step will have been taken towards averting a destruction which is now imminent, for the columns of the great hall are becoming every year more insecure, and Mr. Garstin says, "Should any one of these collapse there is strong probability that it would bring down others in its fall."

THE RELATION OF ARCHITECT AND CLIENT.*

VERY few young architects, and not many old ones, have any adequate idea of the immense responsibility that they incur in carrying out their professional work. They hear of the old French architect who, after a life of honourable and successful practice, was deprived of all his property and thrown into prison, because some sketch-plans which he had made at the solicitation of one of his friends were carried out in such a way as to involve the failure of the building erected from them. They read in the newspapers of the St. Louis architect who had to pay 5,000*dols.* damages to the widow of a man killed by a mishap during a building operation, carried on solely by the contractors; or about the Chicago firm of architects who were pursued in the courts for manslaughter because, as was alleged, they were not present to see that the contractor set properly a roof truss in one of their buildings; and yet they go on in the same old way, trusting to luck to prevent anything of the kind from happening to them.

Trusting to luck is not the best way of guarding against accidents, and I propose to point out in a few words how architects may best prepare themselves to meet a liability, the money-value of which has been estimated by the French courts at 1½ per cent. on the cost of the building carried out under the architect's direction, while it is considered here, by those best able to appreciate it, so grave that I have heard a lawyer of experience say that if he were an architect he would never hold any property in his own name, but would put all his savings in the name of his wife or a trustee of some kind, to prevent them from being swept away as the consequence of some oversight or the mistake of a subordinate, or perhaps by the fault of some other person, simply fastened on the architect by the whim of a jury.

The first and always essential condition of the safe practice of our trying and responsible profession is constant care. It is in one way a misfortune for us that we have to be not only engineers and business men, but artists; and the sympathetic, enthusiastic temperament which makes a good artist is rather liable to be led away from the cold consideration of dollars and cents which is essential to the business man; but it is quite possible for the most brilliant artist to guard himself so effectually against being carried off his balance by passing fancies as to become also a model man of business, and the quick sympathy and active imagination belonging to the artistic character may be and should be useful to the architect in applying that best of all rules for determining one's conduct in affairs with other people—a rule which the architect should engrave in large letters on his mind—try to think how you would feel about the matter if you were in the other man's place.

It is safe to say that nine-tenths of the lawsuits in the civil courts arise from failure to apply this maxim in the early stages of the controversy between the parties, and we shall do well to exercise our imaginations in that way on every possible occasion. Let the architect while making his plans frequently put himself mentally in the owner's place. He will find that the little difficulties of arrangement, which as architect he had smoothed over somehow, as being of little moment amid the general merits of the design, will have a very different aspect to him as owner. As architect, for example, he will probably attach very little importance to the location of the bath-room over the front porch, or the introduction of a few extra winders in the back stairs, but as soon as he assumes in imagination the character of the owner, he will see in his mind's eye the group of plumbers, hot-water pails, disconsolate housekeepers and wondering children that will surround the water-pipes in his bath-room every cold morning, or will hear in fancy the crash of the servants landing in a heap at the foot of his insufficiently-studied staircase, and will apply himself in conse-

quence with renewed vigour to the task of rearranging his plans, until they satisfy him as householder as well as architect; and a little later, when he hears of one of his brethren who has been compelled by a court to pay the cost of altering the plumbing in a building, to get it out of reach of frost, or has been sued for damages resulting from a fall down stairs carelessly planned, his conscience will reward him.

Not only in the designing of his buildings, but still more in carrying them out, must he have constantly in mind, not alone the interests, but even the prejudices of the owner. It is common for young architects to imagine that their quality as artists gives them authority to act for their clients in matters of taste; as, for instance, in the selection of decorations, mantels and so on, and they make contracts for such things without their client's knowledge, only to discover, perhaps, that their client repudiates their interference, and that they have made themselves personally liable to the dealers for the amount of the bills. It is true that the owner may expressly authorise the architect to select furnishings and contract for decorations, and if he does so he will be bound to pay for whatever the architect furnishes for him under this authority; but such authorisation should be given in writing, or before witnesses, and the architect is bound strictly by its terms.

To many architects, both young and old, this limitation of their artistic discretion is very annoying. "What," they say, "can the owner do what he chooses with my design, paint the outside in red and green stripes, put a tower on the piazza roof, or paper the front hall with imitation malachite, relieved with dashes of vermillion, and have I, the artist, the responsible author of the design, no right to interfere, or to confer a benefit on him by exercising my superior knowledge on his behalf, without having to ask his leave to do so?" In France or Italy the answer to such a question might be doubtful, for art and artists are both respected there; but in this country the unanimous answer of the courts would be that the owner is sole master of everything relating to the appearance of his building, and that the architect cannot involve his principal in a penny of extra expense for artistic purposes without his special and express authority.

In regard to matters of construction the case is different. Here, in America, the authority of the architect is paramount to that of the owner, and while the owner would have a just cause of complaint against the architect if the carrying out of the latter's plans and specifications involved constructive difficulties, the occurrence of contingencies which could not reasonably have been foreseen by the architect might make it necessary to take special precautions; and, in such a case, if the necessity were urgent and the owner could not well be applied to for special authority, the architect is not only entitled to order the necessary work to be done and to make the owner responsible for payment for it, but is bound to do so, and the owner would have a good claim for damages against him if he stood by and saw the building under his care suffer injury through his neglect to exercise this authority.

Between the responsibilities which he incurs for doing anything and those which fall upon him if he does nothing the architect's professional career looks a good deal like a perpetual voyage between Scylla and Charybdis; but the channel is not so difficult to trace if one keeps in mind the principle of putting one's self, in cases of difficulty, in the place of the owner. Let the architect imagine what he would say if he should order a new suit of clothes and the tailor should send them home with a lace frill around the bottom of the trousers and a substantial addition to the bill on account of this extra Elizabethan ornament, and he can judge of the feelings of the owner who finds that his architect has ordered mantels built for him at a cost far exceeding that of the job lot of ready-made ones which he had just agreed to purchase, or had secured for him a Morris couch for the alcove which he had intended expressly for his grandmother's haircloth sofa; while, in the same way, the sentiments of an owner towards an architect who will take no responsibility in looking out for his pecuniary interests are very similar to those that would be entertained by the architect himself toward a negligent and careless assistant.

To the young and generous practitioner there is something revolting in the idea that it is necessary to guard himself against his clients, and he would generally much prefer to wear, as it were, his professional heart upon his sleeve, throwing himself with enthusiasm into what he imagines to be his employer's wishes with regard to his new building, and sacrificing, with conspicuous recklessness, his time and trouble to that end. So far as earnestness for the owner's interest is concerned, this is all very well, for zeal must, in young architects, make up for their want of experience; but it is the zeal tempered with discretion that will be of most benefit to his patron, and discretion will soon teach him that his patron's interest, as well as his own, is best served by his own steady maintenance of his professional position. If he shows an incautious ardour in seconding the owner's wishes in regard to the building, without keeping strictly within the limitations of the contract, he is likely to find that he has been regarded by

* A paper read before the students of the Architectural Department of the University of Pennsylvania, by T. M. Clark, and published in the *American Architect*.

the contractor as the agent of the owner for waiving the contract stipulations, and that his zealous suggestions have formed the basis for a long bill of extras, which his departures from the proper judicial attitude of the architect have precluded him from rejecting. Contractors are quick to see and take advantage of this sort of carelessness on the part of the young architects, and the latter should make up their minds that this is one of the disadvantages of their inexperience, which they should make good to their patrons by special caution.

In general, there is but one rule to be remembered in regard to the architect's authority—that it is exactly what is granted him by agreement of the owner and the builder in the contract, and neither more nor less. If the contract says that the work shall be satisfactory to the architect, it must be made satisfactory to him, if it has to be pulled down and rebuilt a hundred times in order to make it so, provided that his dissatisfaction is genuine and not fraudulent or wilful. He is not obliged to give any reason for his dissatisfaction; it may even be proved, as it has been in one case, that the work, as executed, is better than it would be if it were done as he wants it; nevertheless, the contract will hold good and the work must be done over again to suit him, or the contractor cannot recover payment for it. His objections need not even be reasonable. It has been proved that the dissatisfaction was due to ignorance of the subject, but without avail, the law holding that when one undertakes to do work to the satisfaction of another, his contract is not fulfilled by doing it to the satisfaction of some more learned person. In most contracts this clause gives practically all the authority that the architect possesses over the conduct of the work. Although contracts often say, very unwisely, that the work is to be done under the direction of the architect, this clause has not much meaning, for it does not give him any power to change the provisions of the contract and specifications, and to carry these out to his satisfaction obviously involves compliance with the conditions on which, as he informs the contractor, his satisfaction will depend. To give the architect, in so many words, the direction of the work, gives him therefore no more real power in looking after the owner's interest, while it may involve the owner in liability for accidents occurring during construction.

Many contracts constitute the architect arbitrator between the owner and the builder in disputes over matters concerning the building, and a few give him authority to order extra work done. In regard to arbitration, it is well enough to appoint the architect arbitrator between the parties. He always knows more about the subject matter of the dispute than an outsider, and generally decides fairly; and his services cost nothing, while a regular arbitration or a law suit is almost invariably, after great trouble and expense, decided by the adoption, by the arbitrators or the jury, of the architect's opinion, as shown in his testimony. As to the architect's authority to order extra work independent of the owner, it is perhaps sufficient to say that this provision in contracts is becoming obsolete in this country. It is of very little advantage to the owner and is a burden and nuisance to the architect, and the misunderstandings which arise between the owner, contractor and architect where it is inserted and acted upon are so frequent and serious that it is better omitted.

The contract being signed, and the authority of the architect defined by it, let him beware of exceeding this authority in the slightest degree. Many architects appear, when the construction of the building is fairly begun, to put the specifications away and forget all about them, giving orders as if no document existed to show in black and white just what the contract required to be done. It is hardly necessary to say that this is a most hazardous proceeding. Unless the contract expressly gives him the right to do so, the architect has no authority whatever to alter or waive a single item of the contract between the owner and the builder, and, if he does so without authority, he is liable in damages to the party injured. If he sees that the interest of the owner would be promoted by a modification of the requirements of the contract or specifications, he may very properly suggest to the owner the advisability of having the modification made, of course by the owner's order; but he should not order it himself, and still less should he take upon himself to authorise the omission of any work that the contract and specifications call for. Clients of a dyspeptic disposition sometimes reproach an architect who points out to them the propriety of a modification of the contract with having failed in his duty in not having thought of that improvement before, but neither the law nor common sense expects an architect to make plans at the outset which cannot be improved upon, and the bashful architect, who would rather sacrifice safety than confess that he is not infallible, is likely to find his client still more dyspeptic, and with more reason, when he comes to inquire, at the completion of the building, into the cause of the departures from the specification which he has discovered.

Supposing that the architect has set out with well-matured plans, a good and full specification, a clear and precise contract, and a settled resolution not to exceed his authority, and to try to look at the owner's side fairly, in case of differences

of opinion, he has still something to do in the way of guarding himself against intentional deception and oppression on the part of contractor, or owner, or both. So far as private owners are concerned, it is only fair to say that the great majority of them mean to treat their architects honestly, and even generously; and that, in the disputes which arise from their connection, the architect is generally to blame, either for having really neglected his client's interest, or for having failed to come to an understanding in proper season as to what he should be expected to do, and what he should be paid for doing it. Owing, no doubt, to the pernicious practice, which formerly prevailed much more in the profession than it does now, of offering to "submit sketches," without charge, for projected buildings, most people have a most exaggerated idea of the amount of work that an architect is willing to do for the bare chance of being employed; and many are the cases in which an owner, who may be a building committee or a clergyman, leads an architect along from sketch to sketch, alternative plan to alternative plan, supposing all the time that the architect is doing, what he supposes to be, this trifling service as an amusement or as a favour to the church, while the architect as the number of drawings and charges for the draughtsman's time pile up, grows more and more discontented and anxious to know when he is going to get paid, until in desperation he sends in a bill, and from that time there is war between him and those who supposed themselves to be his patrons. In order that such mishaps may be avoided, the architect should set a fair value on his work and should give notice when he intends to ask payment before he does the work. There is no objection to an architect's doing a certain amount of work gratuitously. Many building projects cannot be carried out without interesting a number of persons in them, and in order to interest them, it is often necessary to have plans and perhaps estimates ready to show them. In such cases, some one man usually goes to an architect of his acquaintance and asks him if he will make such plans, with the understanding that his time may be lost if the project fails. The architect is, of course, free to accept or decline the proposal, but if he accepts what is, in most cases, honestly meant to be a favour to him, he should make his acceptance distinct in its terms, showing that he considers his services of value, but that he consents to make an important contribution of work to assist in carrying the project through. In this way all parties know what they have to count upon, and the architect will maintain the essential point of the value of his work. It should not be forgotten that most people value professional service in proportion to what they pay for it; and the architect who is ever ready to submit a sketch on approval is very apt to find that he is set aside in favour of some professional brother whose superior merit consists mainly in the fact that he will do no work without being well paid.

Where, however, the person employing the architect has no claim to gratuitous service, let it be distinctly understood just what the charge will be before anything is done for him. If he does not wish to pay the charge, the architect will have escaped a quarrel, as well as a waste of time, and if he is willing to pay it the whole affair will then go on smoothly and satisfactorily to all parties. It may be said in passing that the would-be clients who think that the proposed charge is too high very often come back subsequently with altered notions on the subject, and make admirable clients; while, unless this preliminary explanation had been gone through, their relations with the architect would probably have resulted in making them his enemies for life.

With public bodies or the representatives of such bodies the architect must be far more cautious. It would take many hours to detail the disappointments, the deceptions and the swindles which architects suffer from committees. As individuals, the members of such committees may be perfectly honest, but where the responsibility is divided the sense of honour is divided also. To my mind architects should show no favour to any representative whatever of any public body or place any confidence in them. If such bodies wish for professional service let them contract for it on proper terms, and by a contract which cannot be broken or repudiated. The profession has seen enough of poor old architects hanging year after year around the lobbies of Congress, trying to urge the passage of a Bill to reimburse them for work done for the public benefit, and under the order of congressional committees, but without the proper guarantees of payment, and of men of talent dying in the prime of their faculties, sometimes even by suicide, through the burden of ingratitude and oppression which they have endured in trying to serve their fellow-citizens; and it has made up its mind that hereafter the public shall come to it honestly or shall go without its services.

For these reasons let the architect who has to work for a State or town or city, or for a church, guard every step. In such cases, where building work is done in pursuance of some statute or ordinance, accompanied by a definite appropriation, it is of the greatest importance that the cost of the work shall not exceed the appropriation. If the young architect will

reflect he can easily see how embarrassing is the position of the members of a public commission or a building committee who are compelled to report that they have, without warrant of law, exceeded their appropriation. Such a confession is at once seized upon by the political opponents of the commissioners to injure them, and they are tolerably sure to visit their resentment on the architect if he can be made to appear at fault in the matter. He should therefore never be at fault in this way, either really or apparently. If the appropriation is inadequate, as it usually is, he should warn the commission of this fact at the outset, fortifying his opinion, if possible, by a careful estimate from some contractor of reputation as soon as the plans are in shape for estimating. If the commissioners grumble, it is better to have them do so at first than afterwards, and the architect may be well assured that in their hearts they will prize him all the more for his disposition to see that they do not get themselves into financial trouble. If they tell him, as may happen, that there will be more money ready when the first appropriation is exhausted, he may take them at their word; but he should not fail in this, as in every other case where he talks of business matters, and particularly in regard to the cost of the building with them, to make notes of the conversation immediately afterward in the memorandum book which every architect should always have with him, recording as nearly as possible what was said by each party, and making a list of the persons present at the discussion. Such a precaution may seem to show a painful lack of confidence in the members of the commission, but it is absolutely necessary. Even if the architect is not obliged later to use his note-book for summoning witnesses in his own behalf, and for cross-examining the people who are endeavouring to throw on him the blame for troubles in connection with the building, it may be of immense value in various ways to the commissioners themselves. Remembering, therefore, that in all public work financial precision is superior to every other consideration, the architect, armed with his well-filled note-books, and with skill, diligence and honesty, can pass with tolerable safety through the dangers of public employment; and the same precautions will help him in his relations with private individuals. In most cases the financial consideration is not really so paramount in private as in public work, as a private owner does not have to get a law passed to enable him to put his hand in his pocket for a little more money to carry his building to completion; but it must never be forgotten that if a man wishes to quarrel with or defraud his architect, he always begins by charging him with having exceeded his instructions in regard to the cost of his building; and it is useless for the architect to explain that the owner instructed him to introduce features which could not be included in the specified sum, courts always holding that where the owner's instructions in regard to the cost of his building and its accommodation or design are incompatible, the architect must be ruled by those relating to the cost, so that unless he can prove to the satisfaction of a jury, and against the solemn asseverations of the owner, that he gave plain warning to the owner in all cases where the latter expressed a desire for increased accommodation or a richer style that this would involve greater cost, in the establishment of which his note-book will be of inestimable value, he must be prepared to find that the jury will side with his opponent.

If he should be so unfortunate as to have any of his controversies decided in court, he will find it desirable to know just what the law requires of him as a professional man. Many clients imagine that it is the architect's duty to divine exactly what his client wants, to satisfy all his requirements, at the first trial, in a plan which will need no modification, and can be carried out for just what the client wishes to spend, and during the progress of the work and afterwards to guarantee the exact compliance of all the contractors with their agreements. Fortunately for the profession this view is an erroneous one. The law is well established that what is required of the architect is reasonable skill and care, with, of course, perfect honesty. What is reasonable skill and care is, by the best decisions, a matter to be decided in accordance with the testimony of other experts, that is, of architects and perhaps builders; that is, the jury is not to be allowed to infer, from the circumstance of defects in a building that the architect is at fault, but must ask other architects whether his conduct was such as reasonable professional care and skill required. The same rule applies to the architect's responsibility for defects in workmanship. It is not he who has agreed to build the house in accordance with the specifications, and he cannot be held, under our law, accountable for the contractor's misdeeds, unless he has failed to show reasonable care and skill in supervision, a matter which must, as before, be established by expert testimony, not by inference.

It would be easy to add much in regard to the precautions which the architect should observe in other relations, but the principle is the same in all—that his client's pecuniary interest is the first to be considered and that he should give fair warning where extra cost will be incurred, and should be prepared to prove that this warning was given, and that, having thus looked

out for his client's pocket, he must do what he is instructed to do skilfully, diligently and carefully, without assuming any authority not expressly delegated to him, and at the same time without abandoning the authority which is so conferred upon him.

ST. GEORGE'S HALL, LIVERPOOL.

A REPORT has been prepared by Alderman P. H. Rathbone, as chairman of the finance sub-committee of the Liverpool Corporation, in which he proposes a scheme for the completion of St. George's Hall. According to the abstract in the *Liverpool Courier*, it is explained that in the year 1836 the Liverpool Council decided to erect a building containing a large concert hall to accommodate the musical festivals, which it was, at that time, intended to hold periodically, and the courts for the assizes, just established, the concert hall forming the centre and the assize courts the two wings. A design for this building was offered by Mr. Elmes, which was at once accepted as a real inspiration of the highest genius. Mr. Elmes, seizing the advantage of having one main hall and two subsidiary halls all lighted from the roof, conceived the idea of a Classic building, which whilst avoiding the strict monotony of an ancient temple, would combine unity and simplicity of conception with a richness and variety of sculptural detail which would at once stamp it as the finest modern specimen of Classic architecture in the world. The first stone was laid in 1838, on the Coronation Day of the present Sovereign. Mr. Elmes's early death unhappily prevented his superintending the completion of the building, but Mr. Cockerell proved himself capable of carrying out Mr. Elmes's scheme, so far as the shell of the building was concerned, and successfully commenced the sculpture required for its completion by the group on the pediment, in which it would appear he was assisted by Mr. Alfred Stevens, but to what extent is not known. The partially completed building was opened in 1854, which was not a very brilliant period of English sculpture. The Council seem to have feared putting so important a work into incompetent hands, and nothing more was done for some years. In 1882 (the prospects of English sculpture having very much improved) Sir James Picton proposed that the Council should endeavour to complete worthily what would be the chief glory of Liverpool, if not spoiled by incompetent hands, and a commencement was made by commissioning Mr. Stirling Lee, after a severe competition, to carve certain panels on the east side of the hall. Doubts were aroused in the minds of some members of the Council as to the success of the first two panels, which delayed the work for some years; but at length, in 1894, Mr. Stirling Lee was enabled to complete the first six panels, and their singular success in carrying out Mr. Elmes's conception was universally admitted. For several cogent reasons the work should now be vigorously, but cautiously, pressed forward to completion. The building would then be a monument perfectly unique in its successful adaptation of Classic architecture to modern uses, and give an idea of the glories of Greek work in its most perfect development. A general tone and character would then be given to the city, which would induce travellers to class Liverpool with the great cities of the world which must be seen. Such a building, for example, would have no small effect in inducing foreigners to select Liverpool rather than Southampton as the city at which they would land on the way to Europe. While other cities, duly impressed with the value of great public buildings as giving importance to them, are apt to attempt to gain this by size rather than beauty, each striving to build the biggest, Liverpool would possess one which, while large enough to give full dignity and grandeur by its size, would chiefly demand attention by the singular beauty of the general idea and of the subordinate details. Owing to the difficulty of adapting the classical forms to modern requirements it would probably remain unique in its character, and be quoted as the only really successful attempt in the world to revive the full glories of one of the finest periods of architecture. Fortunately the opportunity now offers itself. During the last few years a young school of sculpture has arisen in England, which promises to be the finest England has ever seen, and one of the finest in the world. Whether it is to be permanent or not depends upon the encouragement it receives, especially the encouragement of that monumental sculpture, combined with architecture, which forms the highest and most permanent branch of this art. If it does not receive such encouragement it will die out, and England will incur the discredit of having starved out one great element of its genius, and will seriously alter her position among the civilised nations of the future.

Though, unfortunately, many of Mr. Elmes's plans and drawings have disappeared, he has, on the building itself, indicated the position and nature of the sculptures necessary for its completion, the panels for relief sculpture, the bases and pediments for the statues, &c. These Mr. Lee has worked out with great care and sympathy, so that we know what has to be done, and have only to proceed with the work. During its progress

we shall gather to Liverpool skilled workmen of the highest class and set an example which will, no doubt, have no unimportant effect in inducing great companies to erect noble buildings, thus causing Liverpool to take a leading position in the great rebuilding of the cities of England, which will be a prominent feature of the first half of the twentieth century. This will make it a favoured home of those skilled artisans upon whom, in the early future, the industrial greatness of our nation must chiefly depend. The first step would seem to be the completion of the south end of the east wall by placing the requisite figures over the panels already completed, representing the growth of Justice. No nobler inauguration of Greater Liverpool could there be than the completion of this monument of the higher civilisation of a great city. A great and large-minded millionaire could confer no more permanent gift on the city than by undertaking its completion, and it would be one that would hand down his name for many centuries, as the name of Pericles has been borne down to our days by the Parthenon. But it would be far more satisfactory if the city, as a city, would itself accept the responsibility which devolves upon it, and thus enable every citizen of Liverpool to feel an honest pride in being so, and having contributed to build the finest building of its kind in the world. St. George's Hall has, according to the statement in the annual accounts of the city treasurer, already cost 317,000*l.*, and it cannot therefore be thought that the carrying out of the above work, which it is estimated will cost 40,000*l.*, is by any means extravagant, seeing that ten years will be occupied in its completion, and the sum of 4,000*l.* per annum only be required for that period.

Along with this report of Mr. Rathbone is given a scheme, dated December 22, 1894, by Mr. Thos. Stirling Lee, for the sculpture decoration of the hall, the details of which were given some time ago. Mr. Rathbone's scheme is artistic in its inception, and comprehensive in its scope. Whether, in the present condition of trade and the finances of the city, it will just at present receive the necessary sanction from the public and the City Council remains to be seen.

THE WORKS AT PHILÆ AND THE PARTHENON.

AT last week's meeting of the Society of Antiquaries Mr. Somers Clarke, F.S.A., gave an address on these two questions. He said that Mr. Garstin at the end of last year officially announced that the irrigation scheme would be modified in such a way as to reduce the highest level of water in the reservoir to 106 metres above sea-level, and it was expressly stated that this change was made in consideration of the pleas urged on behalf of art and archaeology. The result could not fail to give great satisfaction to all who were interested in the remains of ancient Egypt. Referring to the Parthenon, which he had recently visited, Mr. Somers Clarke stated that the building was in extreme danger. The structure had been much neglected ever since the great injury which it sustained about the middle of the seventeenth century by the explosion of a powder magazine, and it had been much battered during the wars of independence, and was, moreover, frequently shaken by small earthquakes. Eminent French and German architects had, at the request of the Greek Government, reported on the structure, and a distinguished German architect would probably be asked to take the work in hand. It was matter of earnest hope that no attempt at so-called restoration would be made, and that the needful reparation might be so effected that a non-professional person could not discover that anything had been done.

EDINBURGH ARCHITECTURAL ASSOCIATION.

THE annual general meeting of this Association was held on Thursday night, the 30th ult., in the Royal Institution, Princes Street, Edinburgh, Mr. W. W. Robertson, F.S.A. Scot., president, in the chair. The treasurer, Mr. John Johnston, C.A., intimated that the membership had increased to 295, and that the funds were in a satisfactory condition. Other reports were submitted and were approved of. The following office-bearers were elected:—President, Dr. Rowand Anderson; senior vice-president, Mr. Thomas Ross, F.S.A. Scot.; vice-president, Mr. J. Balfour Paul, Lyon King at Arms; and the secretary, treasurer and librarian were re-elected to their respective offices. The President, in his valedictory address, after referring to the great success which had attended the visits of the Association during the past few months, and to the large attendances, suggested that all members interested in these visits should communicate either to the secretary or the president suitable places of interest as they occurred to them. He afterwards referred to the fact that in his inaugural address three years ago, he had spoken of the various projects which from time to time were heard of for the rebuilding of the City Chambers or of their removal to

the New Town. He was glad to say that the question had now been definitely settled, and settled satisfactorily, by the Town Council, on the initiative of the Dean of Guild. The Council, he said, was now acquiring property in the neighbourhood which would give the accommodation required and would complete the building in a satisfactory manner. The effect of what would otherwise be a very dignified square was marred by the inclusion of the block at the north-west corner, which was now to be removed. He hoped that when the work was completed the Council would see its way to improve the façade to the High Street, which was marred by the intrusion of a range of very second-rate shops. If these shops were replaced by a system of suitable arcades the city chambers would then be housed in a building which would be a credit to the city, and which would possess a repose and dignity which would probably be looked for in vain in modern buildings—qualities which the exigencies of modern competitive designing went far to render impossible. Referring to the widening of the North Bridge and the probability of a demand being made for the removal of the Tron Church, the President strongly reprobated any such event as interfering with an interesting landmark connecting modern times with the time of Charles I. The new President then took the chair, and returned thanks for the honour the Association had conferred upon him, and votes of thanks to the retiring President and the other office-bearers brought the proceedings to a close.

GENERAL.

The Slade Professorship of Fine Art in the University of Oxford becomes vacant at the end of the present term. The electors will proceed shortly to the election of a professor. Candidates are requested to send in their names to the registrar of the University on or before June 27. Testimonials are not required. The professorship is tenable for three years. The professor is required to give annually a course of not less than twelve lectures on the history, theory and practice of the fine arts, or of some section or sections of them.

The Hon. R. B. Brett, son of Lord Esher, has received the appointment of secretary to the Office of Works in succession to Mr. H. W. Primrose.

A Stained-glass Window, by Messrs. Heaton, Butler & Bayne, has been presented to the parish church, Stratford-on-Avon, by Mr. W. Law, of Honresfeld.

M. Rodin's group of Eustache de St. Pierre and his five companions, who are represented as Froissart describes them, in their shirts with ropes round their necks, was unveiled in Calais on Monday.

The Jurors have been unable to discover one design in the section of architecture of the Salon that is worthy of the médaille d'honneur, or of a medal of the first class.

Mr. E. B. Tylor was on Tuesday appointed Professor of Anthropology in the University of Oxford. Hitherto he held the readership.

The Episcopal Chapel of St. Jean, in Périgueux, which is in a ruinous state, is to be preserved at the joint expense of the Municipality and the State. It dates from 1521.

A Conference of representatives of the technical instruction committees of various county councils and others will be held at the house of the Society of Arts on the 20th inst., with the object of considering the present lack of a central organisation which might deal especially with such questions as the examination and inspection of classes.

Mr. B. I. Barnato has purchased the freehold property at the corner of Park Lane and Great Stanhope Street, formerly belonging to Mr. John Malcolm. The house will be rebuilt at once from the designs of Mr. T. H. Smith.

The Society of Engineers will in future hold their ordinary meetings in the lecture theatre of the Royal United Service Institution, Whitehall.

Mr. H. W. Umney will read a paper on "Safety Appliances for Elevators" at the meeting of the Society of Engineers on Monday, the 10th inst.

A General Meeting of the Glasgow Institute of Architects was held on May 30. Mr. T. L. Watson presided. Messrs. W. F. Salmon and John James Burnet were re-elected governors of the Glasgow School of Art for three years from August 1 next.

Mr. John Smith, architect, of Sholley Bridge, died on Sunday night in his seventy-fifth year.

Messrs. Perken, Son & Rayment have undertaken the agency for the sale of photographic dry plates manufactured by Messrs. Guerquier, of Ghent, Belgium, within the United Kingdom. Exhaustive trials have been made with these plates, and they are found to be most satisfactory, uniform in quality, and always trustworthy. The prices are, however, most moderate.

The Architect.

THE WEEK.

AMONG the smaller exhibitions now being held in London, that of the Dudley Gallery Art Society ought not to be forgotten. The collection at the Egyptian Hall, Piccadilly, is just now full of the work of the lesser-known British artists, and it is at exhibitions such as this that bargains can be picked up for almost nominal sums. The picture for which Miss WALTER modestly asks 3*l.* 3*s.*, No. 417, would, if it were exhibited under other circumstances, have a much higher figure attached to it. The same price is asked, we believe, for some of Mr. MAY's Sussex scenes, which, as usual, are excellent. Those sent in by Mr. TRAVERS are very telling. The president, Mr. WALTER SEVERN, contributes several examples; one, his *View from Mentone*, is capital. Mr. F. J. ALDRIDGE's *A Pilot Wanted* is a fine study in brown and white. Miss MANBY sends a couple of sketches of old-fashioned folk. Mr. CARTWRIGHT's *Whitchurch Lock* is carefully painted, and the same can also be said of Mr. MEDLYCOTT's *Venice*. It is impossible to mention all the excellent pictures that are to be seen, so we will content ourselves with advising amateurs to go and judge for themselves of numerous drawings which are promising.

A COMMITTEE of the House of Commons on subways in London was amazed when a section of the ground in front of the Mansion House was exhibited, showing a countless number of used and disused pipes, and among the latter were some wood conduits, which apparently it would be actionable to meddle with. The use of wood pipes now seems to be on a par with prehistoric boat-building out of one trunk of a tree. Yet the Americans have tried the experiment of "wood stave" conduits and consider them to be satisfactory. At Denver, which is familiar to readers of BRET HARTE's stories, and now has a population of 150,000, nothing else has been used for the water supply during the past ten years. One conduit 37 inches diameter is 5 miles long, another of 30 inches extends for 16 miles. There are also pipes of 44 inches, 36 inches, 34 inches, and as small as 12 inches in diameter. The pipes are made up of staves of pine; there is a small tongue of iron at one end of each, which fits into a groove in the next stave. The staves are laid to form a circle. We might describe the construction as cooper's work on a very big scale, but instead of the iron hoops at long distances, there are steel bands placed close together around the staves and fastened in iron shoes. Where penstocks are required they are of iron. The system is found to be economical in the timber district, of which Denver is the capital, and apparently there are no disadvantages attending the use of wood.

ANYONE who is desirous to test the efficiency of the jointing in gas mains has only to take a little earth from one of the cuttings which are opened in London, and if, when taken into a room, the odour is not oppressive, then there will be an exception to what generally occurs. The leakage in the mains is surprising. According to a paper which was read at the meeting of the Incorporated Gas Institute at Edinburgh on Tuesday, by Mr. D. IRVING, there is an increase, comparing 1893 with 1883, of 6,000 cubic feet per mile of main. The total quantity unaccounted for in the United Kingdom has increased during eleven years by 1,834,337,000 cubic feet; and any apparent saving there might appear to be in the gas unaccounted for, expressed per ton of coals or per cent. of make, was a delusion. Mr. LEWIS T. WRIGHT attributed the loss, assuming the meter registrations to be reasonably correct, to be mainly due to defects in the distributing system. On the other hand, it was the opinion of many engineers and managers that the circumstances and conditions surrounding numerous undertakings were such that it was impossible to obtain the crucial point Mr. WRIGHT assumed, namely, that of correct meter registra-

tion as between the works and the average consumer's meter. To arrive at a correct estimate of the differences existing between the gas made and sold, Mr. IRVING desiderated correct measurements at the works, consideration of temperature and pressure—aspects of the subject which, it was thought, had been somewhat neglected—the use of first-class materials and workmanship in gasholders, mains and services, proper oversight of consumers' meters and thorough organisation and attention to detail in every department of administration. The competitive system of purchasing stores and material by tender, and scouring the country from Land's End to John o' Groat's, in order to save the fraction of a penny, is not conducive to securing the best article, and certainly not the cheapest. There is no more admirable feature in the management of the South Metropolitan Gas Company than the consistent manner in which they stick to tried and proved firms and contractors who have served them well, some of them for more than a quarter of a century. There is no royal road to secure the reduction of unaccounted-for gas. It is only to be secured by attention to a thousand little things in every department. With wise and well-directed energy, ultimate success is certain.

It is a pity that Judge GREENWELL, who presides in the Gateshead County Court, has not a seat in the Queen's Bench Division of the High Court, for he appears to understand that the performance of architects' work should not be its own reward. On Tuesday Mr. THOMAS REAY, of Newcastle, claimed 45*l.* from the churchwardens of St. John's, Low Fell, for professional services in connection with a proposed parochial hall and Sunday schoolroom. His honour gave judgment for the plaintiff for the full amount claimed and costs, and in doing so he characterised some remarks in the correspondence as a gross insinuation without justification upon Mr. REAY's character. No man could be expected, said the judge, to work for nothing, and he thought that the vicar should have realised that an architect was worthy of his hire. It is not often there is so definite a declaration about the equity of an architect's claims, and we hope Judge GREENWELL's precedent will not be without effect in other courts.

THE competition designs for the new Settlement Buildings of the committee of University Hall will be on public view at Dr. WILLIAMS's Library, Gordon Square, W.C., on Tuesday next, the 18th inst., from 10 A.M. to 1 P.M., on Wednesday from 10 A.M. to 10 P.M., and on Thursday from 8 P.M. to 10 P.M. The architects invited to compete are Messrs. C. C. BREWER & A. DUNBAR SMITH, M. S. HUTH, GERALD HORSLEY, A. H. MACKMURDO, E. W. MOUNTFORD, ERNEST NEWTON, E. S. PRIOR, HALSEY RICARDO, W. STIRLING, F. W. TROUP, F. WALLER and H. WILSON. The honorary assessor is Mr. R. NORMAN SHAW, R.A.

A YOUNG architect who was likely to have made a name died on Whit Sunday near Gibraltar. Mr. HEBER RIMMER was the son of Mr. ALFRED RIMMER, the Chester artist, and was born in 1869. He was an articulated pupil to the firm of Messrs. DOUGLAS & FORDHAM, architects. In the winter of 1890 he carried off the silver medal of the Institute, his contribution being a drawing of Compton Winiates, and in 1891 he secured the Soane Medallion Travelling Scholarship by a design for a chapter-house, and three silver medals in national competitions at South Kensington, while in all local competitions he was invincible. Mr. RIMMER had travelled in Spain, and last year he gave a lecture on the country he had visited before the Chester Archaeological Society. He was also recently the editor of "Sketches," the magazine of the Chester Art School. He was obliged to winter abroad this year owing to his health, and he visited Algiers and the Mediterranean. Encouraging news had recently been received from him, but unfortunately the end came suddenly. Mr. HEBER RIMMER will be greatly missed in Chester among a large circle of friends, by whom he was much esteemed and respected, and much sympathy is felt for his bereaved relatives.

CLIENTS' INTERESTS.

IN every business which presents manifold aspects when seen from within or from without it is unsafe to concentrate attention on one alone. Architecture is in that position. An architect is supposed to be an artist, but there is no doubt he is an agent, and although he might escape damages if he jumbled styles in a building or was indifferent to the proportion of columns or the beauty of ornament, it is very doubtful now whether any negligence in his agency would be excused by a judge or jury. We say now, for every one who studies the operations of the Courts must realise that decisions are becoming less and less mechanical in applications of precedents. There are not new Acts regulating the relations between architects and clients, but the advance of time and the changes in the common ideas of men and things have the effect of modifying judicial and other opinions about those relations. The alteration can perhaps be more clearly exemplified in a case relating to another art, which arose elsewhere. Can any one imagine that ten years ago a French Court would have condemned Mr. WHISTLER in damages because he failed to deliver a portrait? He might have been told to return the cheque he received on St. Valentine's Day, but there would be as much likelihood that it might have been looked on as a tribute of admiration of the painter's ability or a display of patronage, and in either case the money belonged to the artist. In the history of art there are several cases recorded of painters who declined to part with portraits, or transformed them into satires of the subjects. Painters, like other artists and authors, were considered to be an irritable race, and people put up with the freaks which inspiration occasionally played as one of the consequences of the possession of genius. But in these prosaic days a work of art is placed on the same footing as a mechanical production, and MICHEL ANGELO would be held to an engagement with as little allowance as would be made to a man who turned out carvings by machinery. Mr. WHISTLER was treated as if he were a sort of photographer. Only a short time since several French authors and artists by their action proved that they were as ready to apply a stringent rule as the rest of the world. They gave a commission to one of the greatest sculptors for a statue, which was to be delivered on a certain date. With such clients repeated alterations were inevitable, and the model assumed an incongruous character. The sculptor at last became embarrassed in his efforts to co-ordinate strange notions with an ideal of his own. He waited in the hope some happy thought would come to his rescue. The committee held him to the letter of the agreement, regardless of the impediments they created; they insisted on the delivery of the statue on the day appointed, and it was only by strong pressure a lawsuit was avoided. That it would be decided against the sculptor cannot be doubted.

When we find men of genius are so exacting in their dealings with one another in Paris, which is supposed to be the capital of art, it is no wonder that elsewhere we see evidence of the application of a rigorous measure from which architects are not exempted. We published last week an address to American students, which was really a warning against the too prevalent assurance that an architect is saved from all consequences as long as he is supposed to exercise his judgment and display ordinary care in his duties. A case was mentioned where one architect was obliged to pay 1,000*l.* to the widow of a man who was killed "by a mishap during a building operation carried on solely by contractors." In another case a firm of architects "were pursued in the Courts for manslaughter, because, as was alleged, they were not present to see that the contractor set properly a roof truss in one of their buildings." They were no doubt American cases, and it does not always happen that judgments have equal weight on both sides of the Atlantic. Lawyers, however, know that in the States there is often an anticipation of English decisions, for both are derived from common principles; and from the present tendency of opinion in our Courts it is not unlikely that architects who are defendants will find they can escape on easier terms at English assizes than befell architects in St. Louis or Chicago.

Some cases have occurred quite lately in England in which architects, on the advice of counsel, found it wiser to

compromise actions by paying damages than to appear in Court, when not only damages would be assessed, but reputations would suffer. The majority of those cases would be fought out if they arose a few years ago. Formerly clients were afraid to run the risk of incurring costs in an attempt to demonstrate a sort of ethical or psychological problem, for what else is an endeavour to prove that an architect has not displayed the care or skill which was anticipated? A few days back an insignificant action was tried in remote Elgin with an architect for defendant. It arose out of the building of a cottage, and all the damages that could be demanded amounted only to 50*l.*, although the expenses will most likely amount to more than the cost of the building. But small as was the scale of the action, the grounds were set out in a way which suggests what is the vulnerable point in an architect's practice. The following paragraph is an example:—"Instead, however, of discharging his professional duty with reasonable skill and diligence the defendant grossly neglected the plaintiff's interest. In particular, he failed to supervise the various contractors, and to see that the materials supplied were of the quality and description suitable and as provided for in the specifications. He failed to fix any date for the completion of the different sections of the contract, and he totally failed to exercise that personal supervision over the contractors' operations which the plaintiff was entitled to rely upon receiving at his hands as a professional architect." The departures from the specification apparently were the use of one large instead of two smaller panes of glass, a slight change in a skylight, and some trifling extras. But they constituted changes which were supposed to be outside the authority of an agent, and hence the architect was charged with grossly neglecting his employer's interest.

It does not matter whether the building in question is a cottage or a castle, a church or a cathedral, that question of "interest" is common to them all. No perfection in design will compensate if "interest" in one of its myriad varieties can be proved to have suffered in any way during an architect's engagement. Beauty is still an indeterminable quality to lawyers, and, unluckily, to many clients also. Now, every architect who is worthy of the name must be possessed with a desire, in common with painters and sculptors, to create forms that are beautiful. It will be admitted also that it is generally stronger than the desire to insure convenience in internal arrangements. But, as commonly happens a client is more eager for his own convenience than for gratifying other people by the sight of a handsome building, the creative power of the architect is accordingly checked to an extent which is unknown to other artists. Painters and sculptors can enjoy the satisfaction of allowing their genius full sway, a musical composer has rarely to accommodate a score to the peculiarities of a singer, while the architect has to submit sometimes to the fads of servants. There is no getting over these drawbacks, no philosophy can make them bearable. But they cannot be evaded, for any neglect of them will be construed into a failure to use skill and diligence to secure a client's interests which no lawyer who identifies an architect with an agent can ever excuse.

The Annual Meeting of the Devon and Exeter Architectural Society has just taken place. Mr. Arnold Thorne was elected president for the ensuing year and Mr. Crocker vice-president, Messrs. Warren, Commin and Cole were elected on the council, and Mr. Tait was re-elected hon. treasurer. The resignation of Mr. Warren as hon. secretary was accepted with regret, and the selection of a successor was left to the council. Mr. Ballan was reappointed assistant secretary and librarian. The proceedings closed with a vote of thanks to Mr. Jerman for presiding.

The Late Sir George Scharf has bequeathed to the British Museum his letters, correspondence and original writings, excepting such as the executors in the exercise of their discretion may withhold. He bequeaths to the National Portrait Gallery his Order of the Bath and his sketch-books, note-books and annotated catalogues upon certain specified conditions. To his friend, Mr. Augustus W. Franks, of the British Museum, the testator bequeaths his manuscript materials for a much needed work on the chronology of art. The gross value of the personal estate has been entered for probate at 1,349*l.* 4*s.*

PUBLIC LIBRARY, BOSTON.

WE have already given an exterior view of this building from an illustration in the *American Architect*. We now give one of the interior views, which will suggest where some of the paintings will be placed which have been seen in the Royal Academy and elsewhere.

Mr. Waterhouse, some finely wrought decorative work from Mr. Aitchison, organ-cases from Sir Arthur Blomfield and Mr. Bodley, and a variety of contributions from Mr. T. G. Jackson, Mr. Basil Champneys, Messrs. Aston Webb & Ingress Bell, Mr. H. Wilson and Mr. John Belcher. By a curious chance—unless we are to regard it as an example, rather, of a new desire to decorate



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"THE TIMES" ON THE ARCHITECTURAL ROOM.

IN the concluding article on the Royal Academy in the *Times* is the following notice of the architectural designs:—It is never possible to do justice in a brief unillustrated article to a collection of architectural drawings such as are annually shown at the Royal Academy. In what they promise they are more important to the public than the contents of any other room, for they are the sketches of the buildings of the future, and as we have often said, a man may avoid seeing pictures if he wishes so to do, but he cannot avoid seeing the churches, the houses, the town halls that the architect sets up before his eyes in the streets he frequents. Although we cannot discuss the two hundred designs with the minuteness that many of them deserve, we may say generally that they fairly represent the forward movement which has been so notable in English architecture during the last ten or fifteen years, though the great variety of styles here displayed seems to show that we are as far as ever from arriving at a really national school. With the exception of Mr. Pearson, nearly all the best known architects are represented, some of them abundantly; we have a church and a country-house from Mr. Norman Shaw, an insurance office from

what is specially susceptible of it in church furniture—the room contains at least four highly-ornate organ-cases; it is interesting to see the freedom and effectiveness with which some of them have been treated. A tendency to bring colour more and more to the aid of architecture is also shown in Mr. Champneys's new reredos for Manchester Cathedral (1,419), and, in a still higher degree, in the remarkable drawings of a church at Boscombe sent by Mr. H. Wilson. This architect, we believe, was greatly influenced by the late Mr. Sedding, and is continuing some of his work; he shares with him a love of colour which is not common among architects, and a large boldness—perhaps an over-boldness—in design. It is pleasant to see Mr. Norman Shaw reappearing after a brief absence; his country-house and his church (1,460, 1,467) are examples of original work which are nowadays likely to be passed unnoticed by the crowd, because the influence of the architect has been so great that imitations of his buildings are everywhere to be seen. To illustrate this it would be enough to point to a dozen of the country-houses shown on these walls and to point out their relation, if not to Mr. Shaw's "The Hallams," at least to a number of other and earlier works of his.

The Christ's Hospital question would appear to be settled, or nearly so, when we see a number of competitive designs for

the new buildings shown at the Academy and one of them marked as "selected." This is the imposing and costly group sent by Messrs. Aston Webb & Ingress Bell (1,511), which, to judge from the bird's-eye view here shown, leads us to suppose that the Christ's Hospital of the future will boast of the most magnificent school buildings in England, or perhaps in the world. The architect has followed the analogy, though happily not the style, of St. Thomas's Hospital, and has conceived his school as a series of separate houses of similar or identical design, with common public buildings, a large hall, a chapel, schoolrooms and the like. There is a report that the whole thing will cost 400,000*l.*; a long-division sum will easily show how much per boy the cost of lodging alone will be, without reckoning board, clothing or education. Of other large buildings, those which seem most to demand notice are the design for the Darlington Town Hall, by Messrs. Clark & Moscrop (1,570), and Mr. Basil Champneys's for the new Museum at Winchester—the form which the Quingentenary Memorial appears to have taken. This promises to be as successful as the similar building from the same hand at Harrow. The "Staircase Hall, Gosford House," of Mr. William Young (1,595); Mr. Carøe's "Palazzo Hanbury, Ventimiglia" (1,596); Mr. H. C. Corlette's decorative studies in colour; Mr. Gerard Horsley's beautiful sketch of the west front of Wells Cathedral (1,425); and Mr. A. Mitchell's "Week's Sketching in Normandy" (1,523), are all of them remarkable in their different ways.

THE MAYOR OF GATESHEAD.

A PORTRAIT of Alderman W. H. Dunn, mayor of Gateshead, appears in *Northern Gossip*, accompanied by the following memoir:—

Although now the chief magistrate of Gateshead, Mr. Dunn was born in Newcastle in the year 1842, and it was not until the occasion of his marriage in 1867 that he left the canny toon and fixed his residence in Gateshead. From this early stage of his career he quickly rose into prominence both in public affairs and in his professional capacity. Mr. Dunn is an architect practising in Newcastle, his place of business being situated in St. Nicholas Chambers. He was the first pupil of the late Mr. T. Prosser, architect to the North-Eastern Railway Company at Newcastle, and for seventeen years he remained in this employ, acting during the last few years as chief assistant. His architectural work and thorough knowledge of measuring and valuing whilst with this company was of a meritorious character and won him much distinction. In December, 1873, Mr. Dunn entered into partnership with the late Mr. Matthew Thompson, Eldon Square, Newcastle, and since the death of Mr. Thompson, Mr. Dunn has continued to carry on his professional practice under the style of the old partnership. Many well-known buildings, including churches, chapels and county mansions have been built in the North of England from excellent designs prepared by Mr. Dunn, and latterly he has performed creditable work in the erection of two Board schools at Gateshead. The firm are also architects to several landed and building estates in Northumberland, Durham and Yorkshire.

For many years Mr. Dunn was an active member of the Northumberland Architects' Association, for some time fulfilling the duties of secretary, and for two years was president of the institution. His efforts for the promotion of this Society, and his contribution of original papers before the members on different architectural subjects, were honourably mentioned by the executive. He first entered the Gateshead Town Council in 1879, when he sat as a representative of the West Ward. He represented this portion of the borough, enjoying the unabated confidence of his constituents until the redistribution of the wards in 1888, when he was returned as one of the councillors for the North-West Ward. In the year 1891 his ability and twelve years of uninterrupted service to the town was recognised by his colleagues in his election to the aldermanic bench as a successor to the late Alderman Davidson. His association with the Council has been made conspicuous by his active work in the town improvement committee, in which his professional qualifications as an architect and his wide experience of structural matters have proved of invaluable service to his fellow-townsmen in the execution of various public improvements.

A further important position he occupies is that of chairman of the cemetery committee, which he has held since 1891, during which period several improvements have been effected in the cemetery, and it was chiefly through his efforts that within the past twelve months the clergy were induced to forego their charges for headstones and monuments. Mr. Dunn is a member of Durham Road Baptist Church, in which he fills the office of deacon. For many years he took a deep interest in the Sunday-school work of the church and the town generally, and strong evidence of his zealous labours in this

direction was his long occupancy of the post of superintendent of the church school, and his action in the establishment of the Sunday School Union in the borough, of which he may really be looked upon as the founder. In politics Mr. Dunn is a Liberal, but though he chooses to class himself under this shade of party colour he never fails to make it known publicly that he is a supporter of "measures, not men."

Mr. Dunn is an excellent justice of the peace, and takes a great interest in the welfare of the prisoners brought before him. The advice he often gives them is sound and noteworthy, as many have found out to their great advantage.

In private Mr. Dunn is a splendid man, and being no respecter of persons, his lively conversation is free for the enjoyment of all who may be near him.

ART AT THE UNIVERSITIES.

ON Saturday Dr. Waldstein, the Slade Professor of Fine Art at the University of Cambridge, delivered his inaugural lecture. He said that the aim of the artist was to produce art; the aim of the amateur (and all civilised beings ought to be "lovers of art") was to enjoy art; the aim of the student was to understand art. The task which the University student of art had before him was quite distinct from, though it need not be opposed to, that of the artist or that of the amateur. They could not and they need not compete with art academies and conservatoires to produce second-rate painters or sculptors or architects or musicians. But it might be fairly asked whether it would not be well to encourage in the painter, sculptor and musician the amateur's attitude of mind. The effort of producing good artistic work of any kind was so severe, and made such exclusive calls upon the faculties of thought and energy that this very labour and effort might tend to counteract the playful and disinterested attitude of mind which was alone conducive to art enjoyment. Unless the artist kept something of the lover of art in him, something of the amateur, there was a danger that he might become the most inartistic of human beings, to whom the muses were the bringers of pain and not the heralds of purest pleasure. In the same way it might be asked whether it was not wise to encourage in the artist also the attitude of mind belonging to the art student. He ventured to say that the most one-sided views on works of art, the most absolute ignorance of its history, and the most blunted appreciativeness of those works which did not immediately fall into the sacred and exclusive circle of masters approved of came from artists. The chief aim of the art student was the understanding of art in all its aspects. His aim in the first instance was to be purely theoretical, and this theoretical attitude of mind in its fullest and highest form was developed and encouraged in the University. He would urge upon the student the study of the history of art, and in a proper University course all periods ought to be represented. From the humblest beginning to the highest work they ought to follow man's effort in every clime and time. The only period of art which was more or less adequately represented in the University of Cambridge by means of teaching as well as by the recognition of an admission into the circle of University studies and examinations was that of Greek art. He proposed to use his best efforts that the other periods should receive similar recognition and opportunities of study. He held it to be a good sign of an emancipation from the thralldom of examinations that students were more and more breaking through the stereotyped limits of set triposes. The immediate profession for which the University study of art would prepare the student would, in the first place, be that of directors and curators of museums; and, further, it was to be hoped that with the growth and further development of such studies in this country the general standard and tone of art criticism might be raised.

ROSTOCK.

FROM Berlin to Rostock is a trip of four or five hours across the flat land of Northern Prussia, then over the breadth of Mecklenburg to the shores of the Baltic Sea. It is on the high route to Copenhagen, from which city it is, in direct line, only about a hundred miles distant. It is but a short ride over the channel to the Danish islands at this point, and the tall church towers of Rostock guide the mariner nearly all the way. Rostock was one of the old cities of the great Hanseatic League, next to Lübeck the strongest and richest of them all; but she holds political relations to-day with Mecklenburg, one of the most ancient, feudal and non-progressive and, governmentally, most strangely equipped of the states which compose the modern German Empire. The Grand-Dukes of Mecklenburg trace themselves back to the twelfth century, and theirs is the only reigning house in the western world of Slavonic origin. It is their aim to keep up the purity of their race by constantly marrying into the Russian royal family, so that they may be qualified to sit at the head of the meeting

when the Panslavists realise their dreams and break over the bounds into Western Europe.

Rostock is the largest city in Mecklenburg. It has about 45,000 inhabitants, while Schwerin, the capital of the bigger duchy, has but 33,000, and Neu Strelitz, the capital of the smaller, only about 9,000. Rostock is in some senses the capital. There is a palace here for the Grand Duke, Friedrich Franz III. of Mecklenburg-Schwerin, though he seldom occupies it; also the Supreme Courts of the two duchies, the chambers in which the so-called *Stände* meet; and that the Legislature itself does not favour the city when it assembles is because it prefers to camp around in alternate years at two little villages in the interior, down among the lakes and fir-trees of this antiquated realm. The city is also the seat of the 475-year old University of Mecklenburg, and it is the centre of about all the culture and civilisation the little land is able to muster. It is by all odds the most interesting thing in Mecklenburg, and with its mammoth old churches, its curious houses, its walls, gates and moats, and the checkered history of its brilliant past, no traveller in these parts ought to pass the city by.

Rostock is situated up a bay of the Baltic Sea about six miles from the coast. The bay is called a river, the Warnow; but this does not prevent it from having the character of a bay, for above the city it dwindles suddenly away and is navigable for only the smallest boats. In the bay proper the depth is such that large ships may enter, and were it not so far to the east it might have harbour adaptabilities of a kind to eclipse Hamburg. It was its harbour which early made the city such a powerful member of the Hansa, and which gives it still to-day one of the strongest merchant fleets in the Baltic Sea.

Rostock was founded in 1170, though much earlier than this there had been a heathen settlement of Wends on the opposite bank of the river. It reached the pinnacle of its power and prosperity in the sixteenth and the beginning of the seventeenth centuries. Its navy was then the terror of the northern seas, its walls and gates repelled every attacking foreign host, its merchants were the types of luxury and wealth, its University drew to it the ripest scholars of the time and students came from many lands. The history of this old city is, in short, an Arabian Night story, which the visitor comes to feel as a modern reality as he walks through the ancient streets, among the ancient walls and houses, under the ancient arches adown which portcullises used to fall, over the wharves where for centuries have trodden the feet of trade and into the venerable churches, the rare religious monuments of a wealthy past. The city's historical character unfortunately suffered much by a great fire which broke out in 1677, completely destroying many of the smaller buildings and damaging the churches and the larger buildings in such a way that their disfigurement is still noticeable at the present day.

Perhaps the first thing to attract a visitor in Rostock would be the remnants of the city's great fortifications. The city at the height of its power was completely enclosed in walls outside of which, on the landward side, was a moat, one of the most extensive things of the kind in Europe. Though parts of it have been levelled off and converted into park grounds, and other parts have been used by a railroad company to effect an entrance to the town, a very considerable piece of the monstrous ditch is carefully preserved. It is no less than 50 or 60 feet from the top of the earthworks to the bottom of the stream, little though it is to-day, which flows below. Such an excavation was undoubtedly the labour of years, and is marvellous to view when it is recalled how slow and laborious were the methods for doing such work at that ancient time. Having crossed the moat, climbed the high steep bank and mounted the earthworks, there was yet a wall of masonry to pass. All these features of the old fortification system are shown at Rostock. The ditch is now grown up with trees, among which the visitor may walk and look up. He may then walk on top of the great embankment and look down. In summer there are fountains and handsome flower-gardens along these promenades, and the whole thing makes a charming, original and instructive piece of park land.

In the old days everything went by sevens in Rostock, and there was an ancient stanza in circulation among the people which celebrated this peculiarity of the city. It therefore had seven gates, through which outsiders, if they were friends, could come into the city. Of these, only three survive—the Petri Thor (Peter's Gate), so called on account of its nearness to St. Peter's Church, the Stein Thor (Stone Gate), and the Kropeliner Thor. These all date from the thirteenth century. The most interesting of the three, on account of its pictures and inscriptions, is perhaps the Stein Thor. The decorations are of a very ancient pattern, and the city arms are portrayed here in a particularly curious manner. A black griffin, with a double tassel-hung tail, with his wings spread and his feet up, ready for motion, is the symbol of the city everywhere, and it is still in use at the present day. The shields which hold the coat-of-arms are pictured on the inside of the Stein Thor as held up by two lions, which, for curly tails, long, lank bodies,

and wicked, grimacing expression of the faces, excel everything in the catalogue. This piece of Mediæval art is calculated to bring forth a smile from everyone who passes under this curious archway. The griffin in various attitudes is also portrayed on the other two gates. The Kropeliner Thor is architecturally the handsomest of the three. It is of great height, though it has lost most of its earlier ornamentations.

The great churches, once he is inside the walls, will next arrest the visitor's attention. Of these there are four—St. Mary's, St. James's, St. Peter's and St. Nicholas's. St. Mary's is a curiosity which is alone worth a stop in the city to see. There are cathedrals in Southern Europe, but for the man who wants to see something new let him come to the North. Let him visit Denmark, Sweden and Norway, and some of the Northern German cities which have partaken of the Gothic Baltic influence. He will see then what, if it is not always beautiful, is at any rate curious, and that is more than half the joy in looking at a church.

This old St. Mary's is a pile of bricks of massive and stupendous dimensions. Its walls are as thick as a castle's, and on the outside as plain and forbidding. The interest, however, centres in the interior. Here the visitor will at once be impressed with the size of the place. He will run his eyes up the high and fleckless whitewashed walls, so tall that his vision tires before it comes to the ceiling. The narrow windows reaching nearly to the roof seem also to have no end. Yet the ceiling is there, the lofty arches kept from falling together by wooden beams, also whitewashed. In the middle of each little white dome up there is a single gilt star on a blue background. Not another thing to give it colour or decoration. At intervals are suspended chandeliers of candlesticks. The long chains which support these luminaries in mid-air are rough links hooked together centuries ago at some blacksmith's awkward forge. The floor is of gravestones, all bearing dates of two or three hundred years ago.

Once in the middle of the church—with a view of the altar at one end, the magnificent organ and the Grand-Duke's private box at the other, and the pulpit at one side—it is seen at once that this is no mere common provincial church. There is a simple, graceful, artistic beauty here that one may well stop to inspect. There is no way to heat such an immense place in winter, and those who come here every Sunday must sit in the cold. The Grand-Duke has provided against this. In his elevated gallery, surmounted with its golden crown and decorated with its elegant tapestries, he may in cold weather withdraw behind glass, where he can still see and be seen. Beneath the Grand-Duke's box are elevated seats reserved and labelled for the burgomasters, the senators, the judges, the professors, &c. These benches have cushions and fur foot-warmers.

The congregation when it seats itself in this monstrous place will see always before it a cheerful sight. This is the burial chapel of an old Danish king. Over the door of this melancholy vault is a great funeral casket held up by two figures, whom the weight of it well-nigh overcomes. On top of this casket, lying down full-length, with his head comfortably resting on one hand, is the grinning figure of a skeleton. In the other hand it dallies with an hour-glass and the sands of time. At either end of this casket is the figure of a man and woman portrayed as warriors with exposed abdomens which are absurdly expanded and deformed. High in the chapel, over this display, hang the tatters that are left of the war-banners of the old king. This is, beyond any question, one of the most ludicrous things of the kind to be seen anywhere in Europe.

Behind the altar is a wonderful old astronomical clock which dates from 1644. It is of most peculiar and ingenious construction, the work of several local geniuses. There is also a baptismal font here which is reckoned as a treasure. An inscription upon it ascribes it definitely to the year 1290. It will be noticed that at places in the aisles and side chapels models of merchant ships under full sail are suspended from the ceiling. Rostock being a great maritime city, this was anciently done as a propitiation to the gods for the safety of Rostock mariners.

If the other churches of Rostock are not as interesting as St. Mary's, this is not saying that they are without interest. All are built in massive proportions. All are paved with gravestones. All have ships suspended from their ceilings. All have their treasured baptismal fonts. Some contain specimens of wood-carving of very curious pattern. One, St. Nicholas's, has been renovated recently. Its great arches have been closed up, and the interior construction so altered that it now admits of heating, a sacrifice to history, but doubtless a comfort to those who are obliged to sit there every Sunday. Another, St. Peter's, is famous for its spire, a long, pointed construction, roofed with slate, 440 feet in height. It is a guide to Baltic mariners when they are many miles from shore.

The old houses in Rostock in mid-city are a sight on every hand. These are notorious for their front gables, which go up

like a stairway on each side to a central peak. This triangular-looking front is set sometimes with as many as forty windows, arranged in rows. In the first row will be only one or two, but the number increases as the space widens until the lower row is set as thick with them as sparrows on a telegraph wire. Such of them as are preserved in their original form out of the olden time, when glass was scarce, are of wood, except for a small glass eye-hole. Some of these gables are one slope, so that the rain can run down.

There are two old market-places in Rostock, immense plain squares, set with rough stones. The streets are in like manner roughly paved. Even what is new in Rostock is curious. A new monument to Blücher, who was born in Rostock, contains reliefs which represent the warrior driving the demons, bats and wolves, that is the French, out of Germany, by his victory at Waterloo. There is also a monument to the soldiers who fell in 1870-71, with a pair of cannon taken from the French at Metz.

The University was founded in 1418 by special sanction of the Pope, at a time when his consent was necessary. This makes it, with the exception of Heidelberg and Leipzig, the oldest University in Germany. The institution got a new building in 1867-70, which is curious, like everything else in the town. The library is said to have about 150,000 volumes. It is to-day chiefly noted for its chemical school, in which department more than a fourth of its students are registered. The rules still on the books here are extraordinarily peculiar and antiquated. A new student must go and call on the dean within a certain number of days, or be fined so much for contempt. If a student is challenged to duel by another and does not accept within two weeks, the faculty can oblige him to fight, and so on *ad nauseam*.

Rostock is a city which practically governs itself. Though nominally in Mecklenburg, it, like its old Hanseatic sister cities, Hamburg, Lübeck and Bremen, has a kind of republican constitution by which it has acquired in all essential respects the rights of self-government. It has long had independent police and legislative powers, its own courts and its own harbour and shipping privileges. It earlier could coin its own money. It flies its own flag, mounted by its own black griffin, on the high seas, and it has gone on attending to its own business and developing along its own lines, as every rightly-governed city ought. It is still subject in some respects to the ancient laws of Mecklenburg, but it has political liberties possessed by no city in Prussia.

TESSERÆ.

Chinese Lacquer.

THE Chinese lacquer is a native varnish, the product of a tree called Tsi-chou, or the lac tree, indigenous to several of the southern provinces of China, and is frequently cultivated. There are three principal kinds of varnish, prepared directly from trees, in China, the names of which are derived from the three cities where they are prepared, and are, in all probability, produced from three different plants. The Nien-tsi is the best, giving to the articles varnished with it a beautiful brilliant black, but it is the least abundant. The Si-tsi resembles the first-named, but is less brilliant and not so dark-coloured; the two are usually mixed together. The third kind, named Kouang-tsi, is of a yellow colour, and is the most abundant and commonly employed. Previous to use the varnishes are evaporated to the proper consistency by exposure in shallow trays to the sun, and then mixed with a certain quantity of Tong-yeou, or tea-oil, obtained from a plant of the same genus as that from which tea is produced. This oil, which in many respects resembles oil of turpentine, is usually prepared by boiling with a little white arsenic, which acts like litharge in giving it drying properties. Another process is to mix it with the dried matter of ox-gall and a little green vitriol or copperas. The Chinese make an imitation of the Japanese varnishes which they call Yang-tsi, which signifies a varnish which comes from beyond the sea, thus showing its origin. This varnish consists of the third variety above mentioned, the Kouang-tsi, mixed with a finely-powdered charcoal of deer-horns and a little of the tea-oil. There are also other varieties of varnish made chiefly with the Kouang-tsi; as, for example, the Tchao-tsi, which is transparent and of a yellow colour, and consists of equal portions of varnish and tea-oil laid on a ground covered with gold dust, mosaic gold, or powdered copper-leaf, usually known as Dutch metal, so as to imitate aventurine. The same effect is produced even still more beautifully by covering the objects with Kin-tsi, and then dusting this varnish over with gold dust, mosaic gold, &c., over which is laid when dry a coating of Tchao-tsi, so that the gold appears between two layers of varnish. Arabesque ornaments and figures in gold leaf are frequently laid on in this way between two layers of varnish. An imitation of this kind of work is sometimes made on English papier-mache, but it appears not to be so perfectly executed as the Oriental. The very usual gold ground,

which has a flame-like appearance, with tints varying from brass yellow to reddish orange, seen on a great variety of japanned ware in Europe, is made in a different way by colouring the under varnish with annatto, dragon's blood and saffron.

Drapery in Painting.

As we are indebted to the antique for the true standard of human form, we also derive from the same source much valuable suggestion as to the shapes and castings of draperies and other elegancies by which costume may adorn the human figure. But in the imitation of these things, particularly in the casting of draperies, we must never lose sight of the differences between painting and sculpture. The close adherence, for instance, of the garment to the limb, showing its form distinctly through it, may be a beauty in sculpture, but unless accounted for by rapid action or the effect of wind, it may become a defect in painting—a defect we more often find in Michel Angelo than in Raphael. Draperies that entirely conceal the figure by their amplitude often impart a grandeur to the most ordinary attitudes. Early Christian sculpture abounds in fine examples of this, as do the works of Giotto, Angelico, Masaccio, and many of the early Italian painters; and more grace may be often added by length of line to attitudes in themselves graceful, as the long riding-habit worn by ladies gives additional elegance to the manner in which they sit on horseback. But in speaking of the composition of drapery we must refer to Raphael as a master beyond most others worthy of study. In his draperies, as in other things, his exquisite taste is always conspicuous. He neither overloads his figures nor are his lines ever poor or meagre. Action is always aided by the streaming or fluttering or slighter movement of the dress, and grace is made more graceful. A previous position of the figure may often be indicated by the manner in which part of the dress lies on the ground or on some other near object, and there are even fanciful modes by which an action may be assisted by drapery. From the shoulders of the visionary figures of St. Peter and St. Paul, in the *Attila*, their mantles are in part detached, so as to suggest wings, and whether this was or was not Raphael's meaning, the effect is a happy one. It may be said of the draperies of Raphael, where the figures are many, that they are sometimes more beautiful in composition, each in itself, than as parts of one great whole, as in the *School of Athens*, while the draperies of Rubens, on the contrary, are often cast more with reference to the general composition than to the individual figure. Indeed, in the compositions of Rubens and of Correggio, the principle of the whole together is never in the least sacrificed to the parts, though the parts often are to the whole.

Mezza-Majolica.

The Arabians and Persians appear to have made articles in earthenware, which they covered with a sort of enamel, that is, glass rendered milky or opaque with oxide of tin, as early as the tenth or eleventh century. The former introduced the art into Europe, and the celebrated palace of the Alhambra, which was commenced about the year 1273 by Mohammed-ben-Alhamar, Moorish king of Granada, had all its walls partially covered and its floors paved with tiles painted and glazed, termed in Spanish *azulejo*, corresponding to the Arabic *zulaj*. Most of the Spanish Moresco buildings were ornamented in the same manner, such as the Cuarto Real, in Granada, the Alcazar of Seville, &c. The Christian Spaniards imitated the Moorish *Azulejos*, long after the destruction of the kingdom of Granada. The more ancient of these tiles of the twelfth and thirteenth centuries appear to have been painted and enamelled on flat or plain surfaces, while the more modern, and especially the Christian ones, were stamped with indented patterns, which were then filled up with various coloured enamels. The colours were chiefly two shades of blue, hence the name *azulejo*, from the same Arabic root as azure, which formed a ground for arabesques in gold. Vases were also made of this kind of ware, and traces of them have been found in those parts of Sicily held by the Moors. The mode of making these enamels spread from Spain into Italy, or in all probability from the Balearic Islands, which belong to Spain, one of which is Majorica or Majorca, of which the word majolica seems to be a corruption. It is probable that a similar invention was arrived at independently by Luca della Robbia, a Florentine sculptor who died at a very early age in 1430, and who, in order to protect his figures, which were formed of calcareous clay and but slightly fired, from the action of the atmosphere, covered them with a true enamel of tin. To this he gave the name of *terra invetriata*. Articles made by him and by his brothers, nephews and grand-nephews, are much sought after by amateurs of the ceramic arts. They are very beautiful and are adorned with bas-reliefs and figures, the chief colours being a pure yellow, an opaque blue, green, and a rather dirty violet. The clay body or *bisque* was of a light yellow colour, which was completely hidden by the milk-white enamel. It would appear that about the same time the

common earthenware or terra-cotta made at Pesaro for domestic purposes was glazed with oxide of lead or litharge, and even with galena (the common ore of lead); either of these substances when spread as a paint on clay and then heated will form a very fusible transparent glass by combining with the elements of the clay. But owing to this transparency the colour of the bisque or body was seen, in order to hide which they dipped the pieces of ware before glazing into a cream or slip of white clay; it was then gently fired and glazed with a varnish of oxide of lead, potash and fine sand calcined together. This is what amateurs call *mezza-majolica*.

Ultramarine.

In many parts of the world, but especially in Siberia, is found a beautiful mineral of a bluish colour, called *lapis lazuli*, from which is prepared the pigment known as ultramarine, so prized by artists. As every part of the stone is not blue, it must be subjected to a series of operations to free it from the uncoloured parts; for this purpose it is broken into pieces the size of a hazel-nut, and is then heated red-hot, and thrown into cold water acidulated with vinegar, an operation which is repeated seven or eight times, until the stone is capable of being reduced easily to a fine powder. This done, the powder is ground upon a stone, with a mixture of honey and a resinous substance used for staining mahogany, called dragon's blood. When sufficiently ground it is dried, after which it is worked up with a mixture of Venice turpentine, rosin, pitch, bees-wax and linseed oil, placed in a cloth and kneaded in pure water; the ultramarine thereby is separated, the sand and other impurities remaining in the waxy mass. This operation is sometimes repeated where it is desirable to obtain the pigment of very superior quality. The price of true ultramarine varies with its quality from about 3*l.* to 8*l.*, or even 10*l.* per ounce. This extremely high price naturally led persons to attempt to produce it artificially, especially after Clement and Desormes had shown that its composition was very simple, being, in fact, principally composed of silica, alumina, soda and sulphur—substances which would be represented by pipe-clay, common carbonate of soda, and flowers of sulphur. This was effected in 1824 by M. Guimet, of Paris. Others have, however, also solved the problem, among whom we may mention Robiquet and Professor Gmelin, of Tübingen. The process of the former consisted in heating in a closed vessel a mixture of two parts of china clay, three of sulphur, and three of dried carbonate of soda; the resulting spongy mass, when cold, was of a greyish green colour, and was reduced to powder and washed with water, under the influence of which, and of the air, it becomes gradually of an azure blue. When sufficiently washed it is again ignited, to drive off any excess of sulphur. A great many other processes have been proposed and a number of factories established in different parts of Europe, where immense quantities of it are manufactured, the price falling in proportion. When first made M. Guimet charged 1*l.* per ounce for it, but at present a pound weight of it may be obtained for a much less sum.

Eton, and King's College, Cambridge.

One of the first acts of the ill-fated Henry VI. after he had taken the government into his own hands was the foundation of two magnificent colleges, at Cambridge and at Eton. His principal counsellor with whom these beneficial plans were concerted was William of Waynflete, whom he made provost of Eton, and who lived to be himself the founder of Magdalen College, in Oxford. In the twenty-second and the following year of his reign and the same of his age, the king charged the Duchy of Lancaster, which he considered as his paternal estate, at that time amounting to 3,395*l.* 11*s.* 7*d.* per annum, with an annual payment of 2,000*l.* toward the erection of his two colleges, and he confirmed his donation in his will (dated March 12, 1447), to be continued for twenty years. Eton was designed to be "replenished with goodly windowes and vaults, laying apart superfluities of two great curious workes of entaile and busy mouldinge." A cloister 200 feet by 160, and a tower 20 feet in diameter within the walls and 140 feet in height, were described in the plan. Such was the intended magnificence, but it partook of its founder's fate, and was never completed. King's College has likewise failed of its original plan, which is recited in the will of Henry VI. The chapel was to contain "288 feet of assize in length, without any yles, and all of the breadth of 40 feet; the walls to be in height 90 feet, embattled, vaulted and chare-roffed (having a space between vaulting and roof), sufficiently boterassed, and every butterace fined with finials, and betwixt every butterace a window of five bays, and on both sides a closet with an altar therein, containing in length 20 feet and in breadth 10, vaulted and finished under the soyle of the yle windowes." The cloister to be 175 feet by 200, a tower of 24 feet diameter and 120 to the corbel table; and another tower for a gatehouse 30 feet by 22 and 60 in height. The whole premises to be surrounded by a wall 14 feet high, embattled and fortified with towers, as many as may be thought

convenient thereto, "with a large tower towards the High Street and another in the middle of the west end of the new bridge." King Henry's successors of the House of York appear to have been not inattentive to his great work at Cambridge, which had made but a slow progress during his unfortunate reign. It is said that the walls of the chapel had not risen many feet above their foundations at the time of his death. Yet the sums given towards the carrying on of the building were either so sparingly or so irregularly bestowed by Edward IV. and Richard III. that the roof, external ornaments, turrets, pinnacles, vaulting the small oratories and glazing, remained to be finished by Henry VII. Although engaged during the whole of his reign in magnificent architectural works, both at Windsor and Westminster, he certainly did not neglect King's College, and made an ample provision in his will, by which that highly celebrated structure was completed under the care of his executors early in the reign of Henry VIII. A more commanding elevation than that of this chapel, seen from the senate-house, will not be found in any other part of the English dominions. Being a mass, the height of which is sufficient to relieve its great length, it instantly communicates an idea of Gothic grandeur, almost without parallel. But it may be questioned whether the oratories, which have the external appearance of a cloister, do not materially break the general effect of the buttresses and angular turrets, which would have been still more striking could they have been viewed from the foundation to the summit without any interruption.

Varieties of Clay.

When clays are formed from granite rocks they are usually white or yellowish-white, and are very adhesive or plastic; when resulting from the decomposition of slaty rocks they are more or less coloured and sandy, and when limestone mud gets intermingled their plasticity is greatly diminished. The plastic element consists of some combination of silica (quartz or flint in a peculiar condition) and alumina (one of the constituents of alum), with more or less water; but a perfectly pure combination of this kind rarely occurs in nature, there being always present various quantities of sand, iron, lime, magnesia, potash, &c. The less of these substances present the richer or fatter the clay, whilst clay containing a great deal is called poor. These substances not only exert an influence upon the plasticity of a clay, but also upon its relation to fire; the nearer a clay is in composition to a pure silicate of alumina, and the more silica it contains, the more infusible it is, but an admixture of iron or lime will give it the character possessed by a mixture for making bottle-glass, for when subjected to a heat depending upon the amount of these foreign substances it will melt. The finer clays, or such as are infusible and white, are very rare, while those which contain lime, such as ordinary clay marls, and those rich in iron, such as brick clays, are common. A clay may contain so very little foreign substances as to be infusible, and yet have sufficient iron to give it a colour; for we may remark here that the colour which a clay assumes on being burned depends upon the iron which it contains. The fine white clays (*kaolin*) are used in the manufacture of porcelain and are found usually in granitic countries; the inferior white clays (pipe-clay) are usually found in coal districts and are used in the manufacture of earthenware and pipes; at present we shall confine ourselves to the coloured clays. These we may conveniently divide into the infusible or fire-clays, which burn either of a buff or of a dark colour, and the fusible or ordinary brick clays, which burn of various colours, especially of a pale yellow and bright red. The fireclays are chiefly obtained from beds associated with coal, very frequently forming the underlying stratum, and hence called coal-seat, though they are also found under many other circumstances, and even on the surface. They are generally of a bluish-black colour and of a hard slaty texture, a good example of which is afforded by the well-known Stourbridge clay. The fusible clays are derived from various sources, but are very often superficial deposits, constituting the subsoils of large tracts of country. They usually contain a certain amount of carbonate of lime, and in some cases so much as to be true marls. They also frequently contain some sand and pebbles; when, however, the proportion of sand amounts to one-fourth of the entire mass it is not considered as clay in the strict sense of the word, although that substance may be separated from it by washing. Indeed, there are few loose superficial deposits, such as soils and subsoils, that could not be thus made to yield clay. The economical uses of the fireclays are chiefly for the manufacture of brick destined to withstand great heat, the construction of furnaces of various kinds, pots for fusing glass, retorts, &c. The fusible or common clays constitute the materials from which our usual building bricks, roofing and flooring tiles, draining pipes, garden pots, common pottery are made. Both kinds are employed in the production of figures and ornaments in what is called terra-cotta.

NOTES AND COMMENTS.

It is commonly supposed that the proposal to decorate St. Paul's Cathedral which caused surprise about a century ago originated with REYNOLDS and other Academicians. But from the following paragraph which appeared in the newspapers in September, 1773, it would appear the initiative arose with the cathedral authorities:—"The Dean and Chapter of St. Paul's, encouraged by the rapid progress of the fine arts in this kingdom, are come to a resolution of decorating the inside of that cathedral with paintings and such other ornaments as are necessary to complete the original design of the architect, which will make that structure one of the finest in the world. For this purpose they have lately applied to the Royal Academy for its superintendence and support; and on Saturday last the Academy appointed six of its most distinguished artists to carry into execution this great design. The following are their names:—Mrs. ANGELICA KAUFFMAN, Sir JOSHUA REYNOLDS, Signor CIPRIANI, Mr. WEST, Mr. DANCE, Mr. BARRY." Owing to the opposition of the Bishop of LONDON the arrangements were fruitless, and perhaps it was as well, for the figures of Mrs. KAUFFMAN, CIPRIANI and DANCE at least would not be in keeping with WREN's work.

An examination takes place every summer in the Louvre to which the public in general and foreign visitors are indifferent, but the results are often awaited with painful anxiety. Every one knows how numerous are the copyists, many of whom appear to be interminably engaged on favourite pictures without coming to an end. In France every kind of art must receive more or less official patronage or there would be an outcry about the narrow-mindedness of the Government. Copying of Louvre pictures is not excluded. Accordingly, once a year some of the conservators of the public galleries, with a few representatives of the Fine Art Commission, have to undertake an examination of the copyists' attempts. The purchasing powers are strictly limited. About fifteen copies are to be selected, and the highest price for any one must not exceed 1,000 francs. For the majority the sum paid is far lower. But even a few francs may be a godsend to some of the poor artists, and besides there is the gratification of feeling that their works are worthy of being placed among the national treasures. What becomes of the copies nobody inquires. They are sent to the remote galleries in the provinces, but they are rarely seen unless when it is necessary to remove a picture for cleaning or other purpose, and a copy of a great master is used to fill the empty space.

THE old engineer, Herr BAENSCH, will be the observed of all observers at the opening of the North Sea Canal. He is a type of the Prussian specialist official, who is a very different man to the Government civil engineer of England, who is so often little more than an ornamental appendage. Herr BAENSCH, who was born in 1825, in his twenty-first year left the Berlin Academy of Construction, and entered the public service as inspector of land and water works. After some experience in office he began anew studies in iron construction, and was employed in carrying out countless railway bridges, stations and workshops. But when the north coast of Prussia was being wasted by the sea, Herr BAENSCH was despatched to report on measures of safety. His recommendations, which appeared in book form, gained deserved attention. He was appointed director of harbour and canal works, and the improvement of the Rhine was also placed in his hands. When it was decided to undertake the Ship Canal it was considered there was no engineer more competent to direct the operations, and he has had the good fortune to bring them to completion. Herr BAENSCH won his way by ability and industry, and he merits any honours which the Emperor of GERMANY can confer on him.

THE proposed metamorphosis of a part of the Champs-Élysées, in order that the scheme for the International Exhibition of 1900 may be realised, has been discussed at a meeting of the Commissioners. The first question,

whether the existing Palais de l'Industrie, in which the Salon and other exhibitions are held, should be demolished, was decided in the affirmative. The next question was whether new buildings adapted to the requirements of 1900 should be erected or the site be converted into plantations and gardens. Almost unanimously it was resolved to erect buildings of an equivalent area. The associations will therefore not be broken, for the visitors to the exhibition who are acquainted with Paris can seek works of art in the part of the Champs-Élysées where pictures and statues have been seen for several years. It was also arranged that the bridge which is to be erected across the Seine will not be more than 160 feet in width instead of 200 feet. It is intended to raise the 100,000,000 frs. which will be requisite for the works mainly by a novel financial combination, and so long as an addition to taxation is not contemplated, the Government will hardly oppose any project adopted by the Commission. But whatever is arranged the city of Paris will have to contribute one-fifth of the sum required. That appears to be a preliminary condition.

SPLITS in societies of artists are not without advantage. In Paris, since a rival exhibition was set up in the Champ de Mars, English pictures are welcomed, and, instead of a certainty of rejection at the Salon, an English painter can enjoy the privilege of speculating about the gallery which he will condescend to patronise. In Munich there is a similar competition for foreign works. At least one-half of the pictures in the exhibition of the "Secessionists," which was opened last week, were painted outside Germany. Scotsmen are not slow to take advantage of an opportunity, and about twenty of the Glasgow artists are represented. Works are also accepted from Dutchmen and Frenchmen, and in a short time we may expect to find every exhibition in a foreign city is of an international character. Whether British painters can compete with Germans in price is doubtful, and, if pictures are not sold, where is the advantage of exhibiting them?

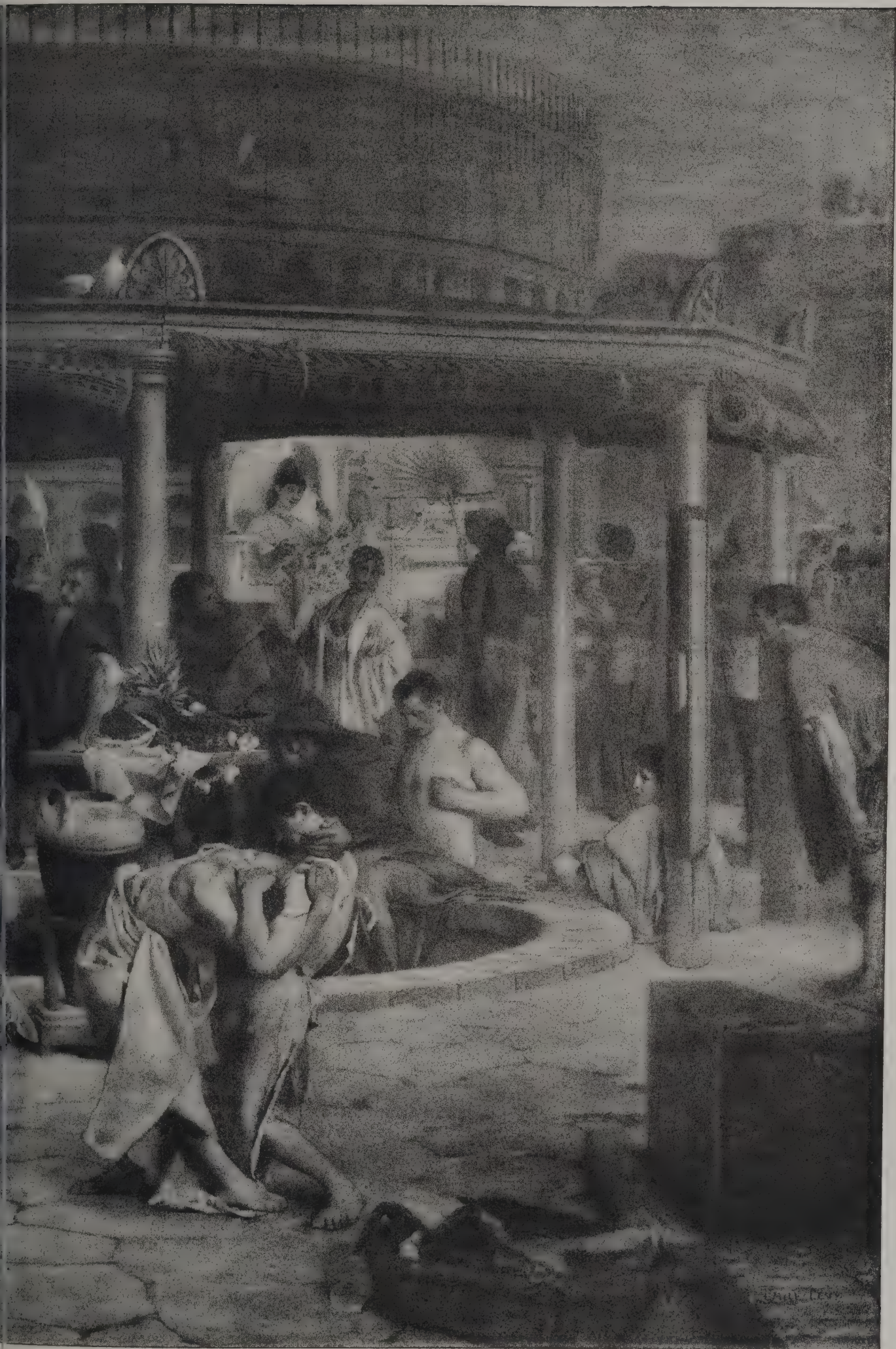
EXAMPLES of students' works of various classes produced in the Glasgow School of Art were lately sent to an exhibition in Liège. From a letter by M. SERRURIER, the president of the committee, it would appear that the excellence of the examples surprised the Belgians. In the course of it he says:—"Our schools of art are far—very far indeed—from being so advanced as yours, and what has above all astonished us in your work is the great liberty left to the pupils to follow their own individuality. Such is so different from the ideas current in our schools of art that it is difficult for us to comprehend this freedom, although we admire it very much. I think the exhibition of the works of your students cannot but cause serious thought and reflection to those here who direct art instruction." The testimony is the more satisfactory, as at one time the Belgian schools were held up as models which could not be too closely followed.

A CATALOGUE has been issued of the books in the library of the Architectural Association. It is too commonly supposed that the collection consists mainly of elementary treatises. But a glance at the pages will show that while books of that class are provided, there is an abundance of advanced works, and among these are many which can be considered as classics. The catalogue is arranged under two divisions, viz. authors' names and subjects. As the pages are only printed on one side, there is space for notes or records of additions. The volume will be found useful by the members.

OLD English and Continental pewter forms the subject of a handbook which is being prepared by Mr. E. GUY DAWBER and Mr. LANGTON DENNIS, 22 Buckingham Street, Adelphi. They will be very glad to receive any information concerning fine specimens of pewter, especially such as are in private collections. Rubbings of marks would be also welcome.



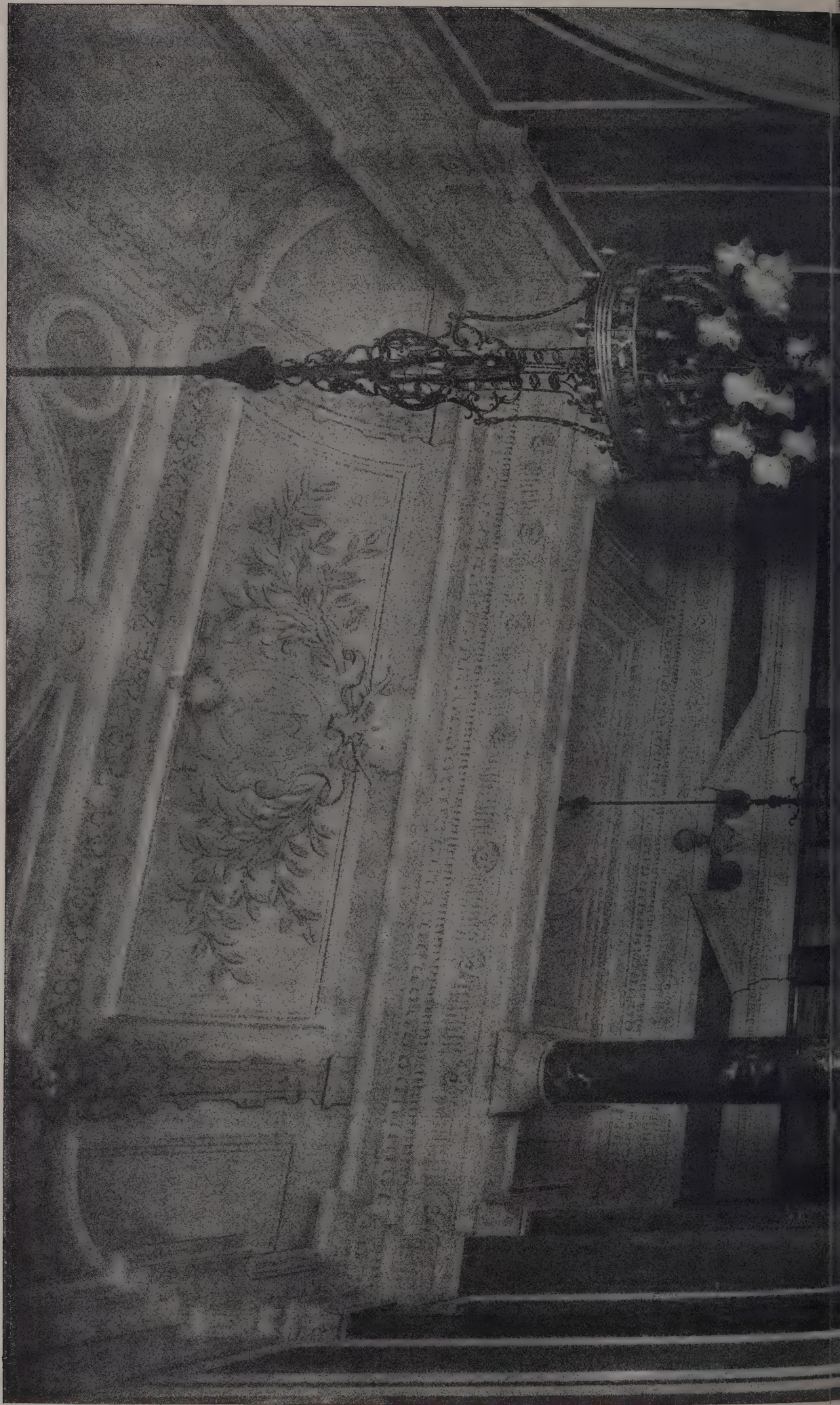
THE CHARIOT
From the Painting by M. ENL.

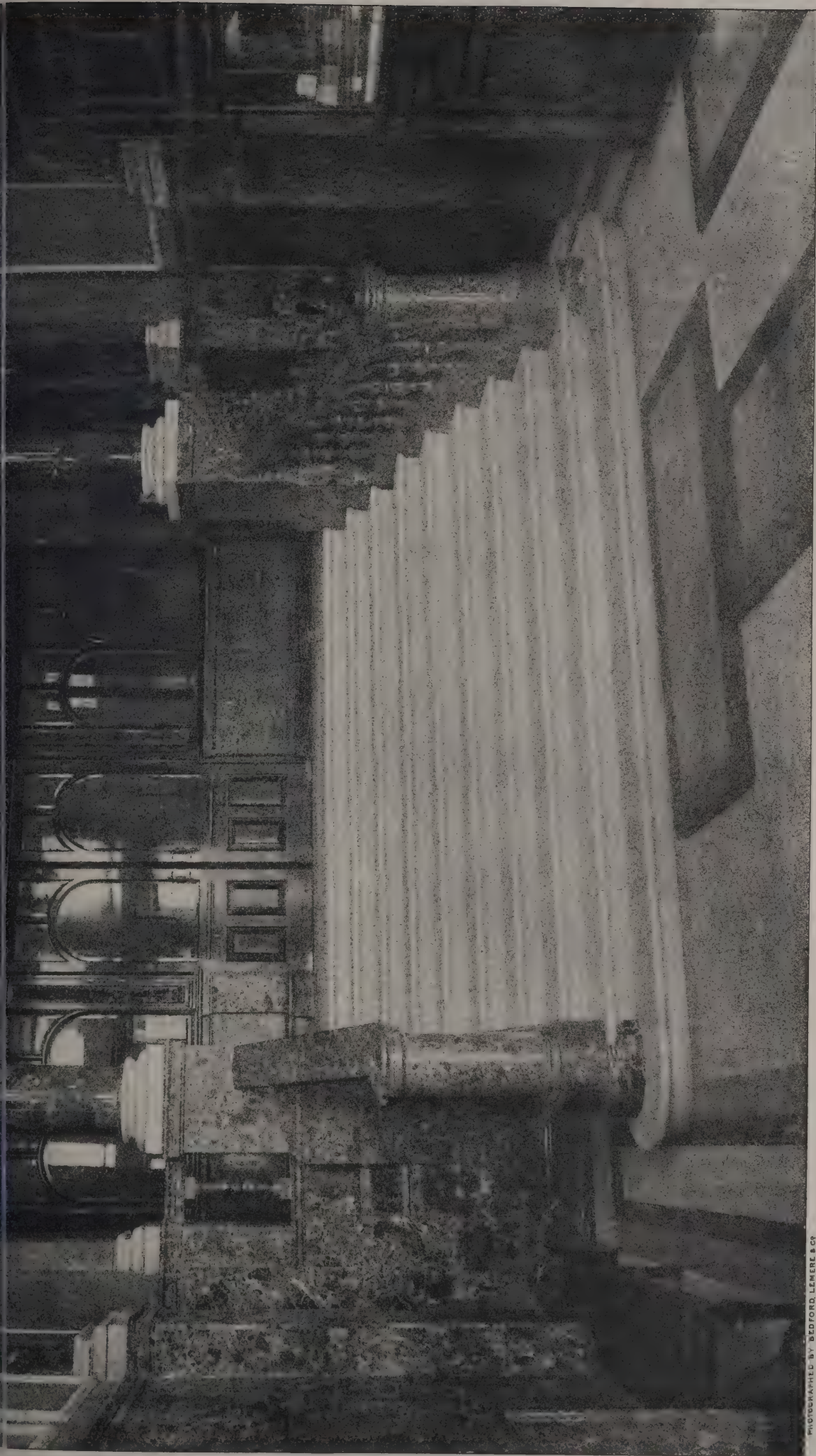


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ATHLETE.
in the Luxembourg, Paris.

The Architect, June 14th 1895.



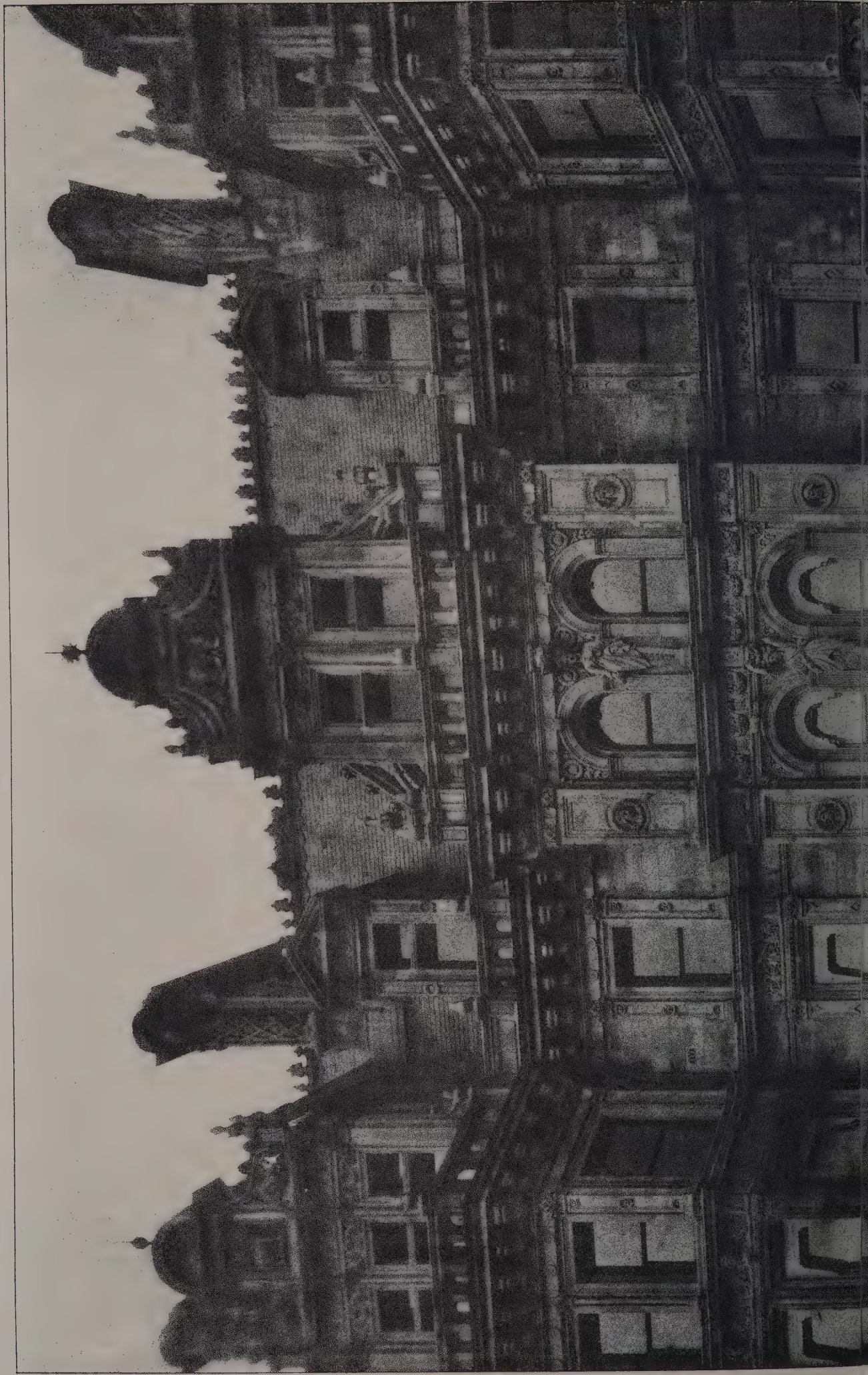


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ENTRANCE HALL: JUNIOR CONSTITUTIONAL CLUB, PICCADILLY.
R. W. EDIS, F.S.A., Architect.

The Architect, June 14th 1895.





PHOTOGRAPHED BY BEDFORD LEMERE & CO

DETAIL OF ARCHWAY: TEMPLE GARDENS.
The Late E. M. BARRY, R.A., Architect.

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ILLUSTRATIONS.

THE CHAMPION ATHLETE.

WE have no phrase in English which is equivalent to the Roman "panem et circences." "Beer and skittles" no longer expresses a working man's ideal, for it suggests exertion to which he is not disposed. "Lords and ices" or "Bread and cheese and the Oval" would not be an attractive cry to the most eager lovers of "the game" in Middlesex or Surrey. But the circus meant all things to a Roman, and to gratify his weakness for it he was willing to live on meagre fare. The most austere could there see manly exercises which recalled old times, and the degenerated race who had become bored with most things felt their blood slightly moved at the contests of Gauls and Britons, who were "butchered to make a Roman holiday." The fierce invectives of JUVENAL reveal how many evils were produced by the passion for scenes in the amphitheatre. His pictures of life, although overspread with a lurid light which in the eyes of the humblest Greek versifier would be contrary to all art, display to us how fate was preparing the city for a conquest by the northern hordes through the disorganisation which arose out of the arena. Yet JUVENAL himself was forced to confess that he was not exempt from the infatuation which was leading his fellow Romans to destruction. In his third satire he relates how one of his old friends, apparently a poet, who also belonged to Aquinum, left Rome because it no longer offered any refuge to the liberal arts. The great men of the city, said the friend, were vagabonds, strolling musicians and mummers. They pandered to the worst passions, for when in office they made the contests between men more cruel; at the least sign of approval a wounded gladiator was slain. At the bottom of all were the Greeks, whose subtlety, impudence and persuasiveness fitted them for underhand dealings. "Do you know what is a Greek?" asked JUVENAL's friend, and he answered his own question by saying a Greek is a grammarian, rhetorician, geometrician, painter, shampooer, augur, acrobat, physician, magician; in fact, an universal man. Order a Greek to ascend to Olympus, and if he is hungry he will find a way there. In the baths and the gymnasia, as elsewhere they were doing mischief which culminated in the circus. Many of the old school of Romans must have joined in that belief. The friend begged JUVENAL to return with him to Aquinum, where, amidst pure air and pleasing fields, they could compose satires in partnership and scourge the prevailing vices. But JUVENAL would not withdraw from the circus and its games. There he saw all that was evil in contemporary life, and we suppose he felt that there was little difference between himself and the sinners around him. Omit from his satires whatever relates directly and indirectly to the circus, and one of the motive powers of the Roman decadence there described will be wanting.

It is not to be supposed that the decline and fall of the Roman Empire was caused by people spending too much time in athletic exercises. "Very few among us," exclaimed JUVENAL, "engage in active exercises, or eat of the food (*coliphia*) of the athletes." Manly exercises were performed by deputies, and in course of time the defence of the empire was supposed to be attainable with as much ease. Sometimes a vigorous gentleman would compete in one of the contests. But if he displayed any skill he was likely to be looked on as dangerous, and doomed to be a victim of whatever tyrant was in power. "To be noble and old in Rome," says JUVENAL, "is to be a prodigy, and has been so for many years; it is preferable to be the meanest on earth than the son of a man who has gained respect." Then there were expenses which were ruinous. The circus was a free entertainment, but men and women can never congregate in public places without competing in the display of costliness. The Colosseum was as advantageous for the foreign milliners of Rome as Ascot or Goodwood is for those of London. To what extremes people were brought is suggested by one of JUVENAL's miniature sketches. He represents a lady he calls OGULNIA as deprived of fortune; nevertheless it was necessary for her to hire robes, tall slaves, followers, a litter, cushions, friends, a duenna, and a blond young girl to deliver messages, in order to appear in a becoming manner at the

circus. She might be the grand dame introduced in M. LEVY's painting. The remains of the family plate were sacrificed by her as presents to the athletes in order that she might appear like other women, many of whom, says the poet, do not hesitate to allow hunger to enter their houses rather than sacrifice anything that is supposed to be necessary in those appearances before the public. But more pernicious than any outlay on personal adornment was the law by which only men who were possessed of a prescribed sum were allowed to enter certain parts of the amphitheatre. That gave a new impetus to the pursuit of wealth by which the Romans became still more regardless of the sufferings of others, and it was the cause of many crimes.

M. EMILE LEVY, in his *Mela Sudans*, which we illustrate, does not enter into competition with M. GÉRÔME in depicting the excitement of a gladiatorial combat within the Colosseum. He is content with giving a suggestion of a scene which might have arisen in one of the dependencies of the amphitheatre where the athletes received the final touches of grooming. Roman contests are too commonly supposed to have been all fought by retiarii, secutores, mirmillones, threces, or other variety of gladiators. There were also competitions between professional runners, wrestlers, boxers, and apparently combined exercises of various kinds. It is not, however, possible to discriminate between Greek and Roman practice. We may suppose that the Greeks were as likely to be utilised in training as in the arts, and the system which was adopted in the Olympian and other contests was probably repeated in Rome.

The favourite to whom so many eyes are turned in M. EMILE LEVY's painting looks as if he were trained to take part in more than one competition. Old and young, women as well as men, behold him with approval. The patrician in the embroidered toga (which at one time was sacred to warriors who were granted a triumph) evidently considers he is to be envied for his acquaintance with such an athlete, while the backer or trainer on the other side of the hero is manifestly nervous that with so much adulation his instructions may be forgotten. The struggle between the two boys would suggest that a wrestling match will begin the contest. The other athletes are of little account; one alone has secured all sympathies. M. EMILE LEVY affords us a glimpse of ancient Roman life, a peep, as it were, behind the scenes of public entertainments, for which he could have no authority in any ancient author, but which is likely to be true, for it is an inference from the discoveries and speculations of later archæologists.

ENTRANCE HALL, JUNIOR CONSTITUTIONAL CLUB, PICCADILLY.

DETAIL OF ARCHWAY, TEMPLE GARDENS.

DHO FAR AND THE FRANKINCENSE COUNTRY.

AT the meeting of the Geographical Society on the 6th inst. a paper was read by Mr. J. Theodore Bent on his travels in Southern Arabia. In the course of it he said that Dhofar, the ancient frankincense country, at which point the party elected to commence their winter's campaign, is 640 miles by sea from Muscat. They reached it by steamer. Dhofar is nominally under the Sultan of Muscat; its ruler is Wali Suleiman, a man of remarkable strength of character and determination, who has 12,000 Bedouins devoted to him. He related with pride that two years ago he had sent 2,000 rupees as tribute to Muscat, last year he had only sent 1,000, and this year he had sent none. His next step will probably be, when a favourable opportunity offers, to declare himself independent under British protection. For this reason he was exceedingly polite to the travellers, entertained them in his palace by the coast at Al Hafa, and arranged with the greatest possible assiduity for their safety during the exploration of the interior. Dhofar and the Gara mountains, which encircle it, form a quite abnormal feature in this otherwise arid coast. From Cape or Ras Risout in the west to Merbat on the east there is a long narrow stretch of flat alluvial soil at the foot of the mountains, very little raised above the level of the sea. This plain is never more than nine miles wide, and at the eastern end, where the mountains come down nearer to the sea, it is reduced to an exceedingly narrow strip. The plain is very fertile, and

capable of producing almost anything. Along the whole line are many groves of coconut palms. Tobacco, cotton, Indian corn and various species of grain grow in great abundance; in the gardens are many of the products of India flourishing, namely, the plantain, the papaya, mulberries, melons, chilis, brignoles and fruits and vegetables of various descriptions. In fact, Dhofar and the Gara mountains may be termed one large oasis by the sea, bounded on the north by the Nejd desert, on the east by the Oman desert, and the gradual tendency to the west is towards the arid hills and sand-choked valleys which were met in the Hadramout last year. The Gara mountains are full of water forming itself here and there into small lakes. They are decked to their summits with rich vegetation, and this will account for the fertility of the plain of Dhofar. The one drawback to the progress of this country is its harbourless condition. During the north-east monsoons dhows can find shelter at Merbat, and during the south-west monsoons at Risout, but the rest of the coast-line is provided with nothing but open roadsteads with a rough surf always rolling in from the Indian Ocean. The party traversed the whole of this plain between Capes Risout and Merbat in various directions, and found thereon the sites of ruined towns of considerable extent in no less than seven different points, though at the two capes where now is the only anchorage there are no ruins to be seen, proving that anchorage of a superior nature existed here in antiquity, and which has since become silted up, but which anciently must have afforded ample protection for the boats which came here in the frankincense trade. At Takha there was a very extensive and deep harbour, running a considerable distance inland, which with a little outlay of capital could easily be restored. After a close examination of these ruined sites there can be no doubt that those at a spot called now Al Balad and Robat, about two miles east of the Wali's residence, formed the ancient capital of this district. The travellers visited them last Christmas Day and were much struck with their extent. The chief ruins are by the sea, around an acropolis some 100 feet in height. This part of the town was encircled by a moat still full of water, and in the centre, still connected with the sea, but almost silted up, is a tiny harbour. The ground is covered with the remains of Mohammedan mosques and still more ancient Sabæan temples, the architecture of which—namely, the square columns with flutings at the four corners and the step-like capitals—at once connects them architecturally with the columns at Adulis on the Red Sea, those of Koloe and Aksum in Abyssinia, and those described by M. Arnaud at Mariaba in Yemen. In some cases these are elaborately decorated with intricate patterns, one of which is formed by the old Sabæan letters Θ and X, which may possibly have some religious import. This town by the sea is connected by a series of ruins with another town two miles inland, now called Robat, where the ground for many acres is covered with ancient remains; big cisterns and water-courses are here cut in the rock, and standing columns of the same architectural features are seen in every direction. With the aid of Sprenger's "Alte Geographie Arabiens," the best guide-book the traveller can take into this country, there is no difficulty in identifying this ancient capital of the frankincense country as the *Μαυρείον Ἀπρέιδος* of Claudius Ptolemy. This name is obviously a Greek translation of the Sabæan for some well-known oracle which anciently existed here, not far, as Ptolemy himself tells us, from Cape Risout. This name eventually became Zufar, from which the modern name of Dhofar is evidently derived. In A.D. 618 this town was destroyed and Mamsura built, under which name the capital was known in early Mohammedan times. Various Arab geographers also assist us in this identification. Yakut, for example, tells us how the Prince of Zufar had the monopoly of the frankincense trade, and punished with death any infringement of it. Ibn Batuta says that "half a day's journey east of Mamsura is Alahkaf, the abode of the Addites," probably referring to the site of the oracle and the last stronghold of the ancient cult. Mr. Bent proceeded to show that having assured himself of the locality of the ancient capital of the frankincense country—for no other site along the plain had ruins which would at all compare in extent and appearance with those of Al Balad—other sites fell easily into their proper places, and that thus an important verification of ancient geography and an old-world centre of commerce had been obtained. He next described his visit, under the auspices of the Gara tribe, to the confines of the Nejd desert. He had never had to deal with wilder men in his life than those who constituted the escort; they wore long unkempt hair, tied down with a leather thong like a bootlace. Each man carried his wooden shield, called a gohb, so constructed with an iron knob that he could turn it round and use it as a stool to sit upon; his wooden spear pointed at both ends, called ghatrif, a weapon peculiar to the Gara tribe, which they hurl with wonderful precision, and his flat iron sword called saif. Very few also carried matchlock-guns. These wild men were in most respects friendly, but of a most independent spirit. If asked to do anything for the travellers, they would reply, "We are sheikhs,

not slaves." They affected indifference for money, and absolutely the only hold the explorers had over them was medicine. They positively loved Mr. Bent's medicine-chest and during the journey consumed an incredible quantity of pills, quinine and other dainties. At first they would chew the pills, with disastrous results, but were soon taught to swallow them in the orthodox fashion. Every night there was a row of them wanting to be doctored, and with this feeble weapon Mr. Bent ruled. They took the visitors to see everything in their country. In type they are akin to the Hadramout Bedouin, small, active, and with finely cut features, but they are much wilder and less accustomed to contact with civilisation. They live chiefly in caves and under trees, only using reed huts when they come down to the plain to encamp with their flocks during the rains. Near Cape Risout a large tract of country is covered with frankincense trees, with their bright green leaves like ash trees, their small green flowers, and their insignificant fruit. The frankincense, the old staple trade of this district, is still gathered in three places in the Gara mountains. The best is obtained at spots called Hoyé and Haski, about four days' journey inland from Merbat, where the Gara mountains slope down into the Nejd desert. This quality they call leban lakt, and altogether about 9,000 cwt. is exported yearly and sent to Bombay. It is only collected in the hot weather before the rains begin, in the months of March, April and May, for during the rains the tracks on the Gara mountains are impassable. They cut the stem, and after seven days' return to collect the gum which has exuded; this they do three or four times a month, and in the cool weather, as the gum comes but slowly, they leave the trees alone. The trees belong to the various families of the Gara tribe; each tree is marked and known to its owner, and the product is sold wholesale to banyan merchants, who come to Dhofar just before the monsoons to take it away. Some wonderful scenery, including that of the gorge of Ghersid, was next passed in review. Here the sweet-scented white jessamine hung in garlands from the trees, and the air was fragrant with the odour of many flowers; above towered grey rocks, and the hill slopes were clad on both sides with trees. The highest point of this range of mountains is not more than 3,000 feet, and at the camp that night the explorer registered 2,600 feet. He found the Gara women exceedingly shy and retiring; they fled, if approached, like timid gazelles. They have but poor jewellery—silver necklaces, armlets, and nose and toe rings; they love to join their eyebrows with antimony, and stick some black sticky stuff like cobbler's wax over their noses and foreheads; they are very small, and like Japanese; they do not cover their faces, and are very lightly clad in dark blue homespun cotton garments. Mr. Bent went on to describe a remarkable cave just above the plain, and only about ten or twelve miles from Al Hafa. This cave burrows far into the mountain side, and is curiously hung with stalactites, and contains the deserted huts of a Bedouin village. Immediately below this cave in the Wadi Nefas are the ruins of an extensive Sabæan town, in the centre of which is a natural hole 150 feet deep and about 50 in diameter. Around this hole are the remains of walls and the columns of a large entrance gate. He asked for information about this place, but all he could get in reply was that it was the well of the Addites, the name always associated with the ruins of the bygone race. In his opinion this spot is the site of the oracle mentioned by Ptolemy and others from which the capital of Dhofar took its name. It exactly resembled the deep natural holes that they had found in Cilicia, in Asia Minor, where the oracles of the Corycian and Olbian Zeus were situated. Perhaps an enterprising archaeologist might hereafter be able to open the ruins about here and find the identification from epigraphical evidence. At Takha he found extensive remains of an ancient town, which must have been second only in importance to the capital at Al Balad. The ruins were exactly as Yakut says, five parasangs, or twenty miles, west of those of Zufar at Al Balad, and as there were none at the modern town of Mirbat, and only indifferent anchorage during the north-west monsoons, it would suggest itself that the Mirbat of antiquity was situated here. On the following day this somewhat puzzling question was settled for the explorer by finding the only thing wanted to identify the spot, namely, a commodious harbour. An hour's walk from the camp near Takha took the party across a promontory where the estuary of a river formed quite a large lake, separated from the sea only by a narrow sand belt, over which the water flowed at high tide. Around this lake were the ruins of several ancient buildings, and what was now a headland connected to the mainland by a neck of sand was surrounded by an ancient wall and fortification, and bore the appearance of having once been an island protecting the entrance to a harbour. Here they had the one thing wanting to identify the site, namely, the harbour to which Yakut referred, where the ships which came to Dhofar in the frankincense trade found anchorage. The Abyssapolis of Ptolemy, like *Μαυρείον Ἀπρέιδος*, was evidently the Greek equivalent for some Sabæan name, or merely called from the existence near

this spot of a remarkable abyss, standing there still as one of the world's wonders, constructed by nature on the same principle as the Pink and Yellow Falls in New Zealand and the calcareous deposits of Yellowstone Park. He concluded by narrating some curious local customs, and by expressing an opinion that the Bedouins of the Gara tribe speak a distinct and separate language, and not a dialect of Arabic, as in the Hadramout. So far as this year was concerned, the further survey of the Hadramout had to be abandoned. His original plan was to go up the Wadi Mosila, which is said to contain many interesting sites of ancient towns, to cross over the tableland again east of the hostile Katiri tribe, visit the tomb of the prophet Hud, the Mecca of this portion of Arabia, and the volcano of Bis Barhut, which had been described to him as a large hole in the mountain side, out of which issue volumes of smoke; it was similarly described by the old Arab geographers such as Hamdani, Idrisi and others, and was the place described in the Koran as the abode of infidel souls after death. This neighbourhood should be replete with natural and historical interest, and Mr. Bent hopes that, with adequate support from the Aden Government, he may be able to reach it another year.

ARTISTIC DOMESTIC ARCHITECTURE IN AMERICA.*

THE development of artistic architecture in America began after the Philadelphia Centennial. Good architecture of a certain class we had before that time it is true, but that exhibition pointed the way to culture that speedily penetrated all forms of art and of industry. The general movement toward higher artistic ideals inaugurated by the Centennial soon found expression in architecture. The present revival of the art—for notwithstanding many depressing manifestations we are living in a time of vast architectural interest if not strict revival—is not to be attributed solely to the action of the impulses started by the Philadelphia exhibition. The educated architect, trained especially for his profession and in a professional manner, is scarcely older in this country than that time. Not that all our present architects are the young men this statement would seem to imply, but the road to the practice of architecture is now almost wholly through the schools for preliminary study, or through the practical work of a trained architect's office; the result is much the same whether the preliminary schooling is had or not. The road through the carpenter's shop and the work bench, which in the past produced some faithful men, but few artists, has been closed for all time. The present revival has accomplished that if it has failed in other things.

The training of architects and the spread of artistic culture have gone hand in hand. Guided by the one, inspired by the other, people to whom the very word architecture was long unfamiliar now profess a more or less general acquaintance with the art, and when they build insist on structures of a certain standard of artistic excellence, depending for the most part on the ability of the architect whom they employ and on the taste, if not on the accuracy, of their own judgment. There is still a vast deal to be done. People of the broadest culture, of refined temperaments, are still paying for the erection of the most inartistic structures, and architects without the smallest artistic quality are still commanding lucrative practices. In a genuinely artistic age such things would be impossible. It is a significant indication of our own position in history that we can tolerate them and calmly rank them among the peculiarities if not the glories of our civilisation.

The severest of the critics must admit the general spread of the artistic quality in American architecture. The days of bad things are not yet over, but they are rapidly diminishing. Important and costly work is generally placed in competent hands, though the structure of our architectural economy is such that the master of the country house is supposed to be likewise master of the high commercial building. But radical reforms work slowly, and we must take architecture as it is if we would understand its present status, and not as it ought to be. For it is easy enough to tell how it ought to be, but it is a very different matter to analyse it and estimate it at its present and actual worth.

Modern American architecture is more complicated and diffuse than the architecture of any contemporary nation or of any past epoch. Our buildings are more varied, our conditions more complex, our needs more numerous, our materials more diverse, our resources more abundant, and our artistic qualities and appreciation less acutely developed than with any other people or in any other time. With all these complexities we have the additional disadvantage of having no style of our own, but of being free to choose where we will or where temporary fashion may dictate. Our architecture necessarily

reflects these complexities and is quite as confused and as indiscriminate in its growth, its development and its work as such multifarious conditions would suggest. The difficulties in the way of artistic work are, therefore, enormously enhanced by the conditions, by the vagaries of architects and of clients, the inclinations of the one, the ignorance of the other, the persistence with which each will seek to find the mote in the other's eye while oblivious of the beam in his own; and yet in the face of such adverse circumstances the last few years have seen a steady progress in the artistic development of American architecture, a constant growth in the materials used by the architect and in the standard of appreciation manifested by the client and the public at large. Good buildings are no longer scarce, though not so plentiful as one could wish; bad buildings are diminishing in number, though every now and then the most preposterous work will be produced by the most capable hands under conditions entirely favourable for good. The psychologist may still find material for experiment and philosophising in the architecture of the present day if he will but turn his mind to it.

The artistic quality in American architecture may be viewed generally as a whole, or with reference to the individual claims of some few architects to be considered artists. The use of the word artist in this connection is not the same as when applied to the painter and the sculptor. The architect, even in his most artistic moods, cannot be a free untrammelled artist as the painter may. His art is limited by harsh conditions, he has to do with unyielding materials and with circumstances and requirements over which he has no control, and which often enough prevent his giving even an artistic form to his building. But the true artist-architect, if I may use so barbarous a combination, will always leave the impress of his art upon whatever structure he undertakes. It may be seen in the detail, in the use of ornament, in the general arrangement and in the plan, even though the final completed effect falls short of what he himself would wish it to be. A master of the art of architecture must always be a master. His work is permanent and enduring and may be seen of all men. His responsibility is thus greater than his brother artists in painting and sculpture, whose works may perchance be destroyed, while his own remains to tell future generations of his work—perhaps of his failures.

Of the artistic architect we have but a few, perhaps no more than can be counted on the fingers, perhaps no more than can be counted on those of one hand. But we are no worse off than other nations in this respect, for architecture is so largely a matter of business and of management, and success in it so often dependent on everything but artistic skill, that the truly artistic architect can only be a rarity even under the most favourable circumstances. And then there is the extraordinary fact that the best of architects, the men whose names are most familiar to the world, whose work is most in evidence and who have the most work to do and the most important, are constantly doing the things they ought not to do, and that in the most extraordinary fashion. But we have architecture in America that is not wholly the product of the artist-architect, work very good in itself, admirably suited for the purposes for which it is intended and dowered with a grace and beauty that lift it above the ordinary, though its creators may not all of them be properly called artists in the truest sense. It is this ability of so many of our architects to produce interesting buildings which renders the outlook so hopeful and which makes American architecture in its best forms—and this, it should be remembered, is the latest—among the most interesting now to be found anywhere.

This artistic quality is manifested in many ways, but in none is it more abundantly seen than in the country house. American architects, with but one or two exceptions, have not yet accomplished the solution of commercial and business problems in an artistic manner; even the town house, when confined to the narrow limits of city lots, is not always the work of art it ought to be. Many of our churches are well done, and some of the other buildings, but in country houses very great excellence, if not absolute superiority, is universally conceded to the American. Here opportunities for individual work have been most frequent. The architect has not been restricted by the awkward conditions that limit his work in the city, and it is to this freedom from restraint that the success of the American country house is chiefly due.

The country house has an environment that invites artistic treatment and largely supplements it. The problems it presents are simple, yet of infinite variety, and the demand for buildings of this class has come primarily from well-to-do and cultured people who wished their houses to reflect their own culture, and to partake of that artistic feeling that has crept into so many elements of our life. The country house is made to order; it is not built in rows wholesale. Opportunities for speculative building have not been so frequent as in the cities, where it has well-nigh stifled individualism in house architecture. Everything favoured a new departure in architecture, and about the time that the artistic movement set in the country house people

* From a paper by Mr. Barr Ferree in the *New England Magazine* for June. (W. F. Kellogg, Boston.)

began to realise that the joys of living were not all to be found in the narrow, crowded limits of the city. The suburban town began to boom, and with it arose fresh opportunities for the architect. Country seats on a new scale began to develop, and those who already possessed houses in the country started in to make improvements and changes which not only resulted, often in a complete metamorphosis of the old building, but which at the same time conformed to this new feature of country living. Our cities, in their turn, spread out further into the country. The suburban and the semi-detached house felt the change, and new fields were opened up that our architects have been swift to fill with their best work.

The movement began with the picturesque, which is quite distinct from the artistic, though sometimes confounded with it. The picturesque is the preliminary stage, the artistic the epoch of full development. Moreover, a thing may be picturesque without possessing any artistic quality. Still it was a preparation for the artistic that we needed; and while we have not yet wholly passed it—for every day new work may be seen that is better described as picturesque than artistic—we should not be hasty in condemning it. Its most conspicuous influence has been the development of a sort of rococo period of roofs, dormers and turrets, grouped more or less effectively, but sometimes with such results that nothing save the roof is visible, the house being so buried in its covering as to be quite insignificant. Multitudes of such designs have been made, multitudes of such houses built, and doubtless multitudes of people live in them, though it would certainly seem that outside the tropics, where such styles of dwellings are exceedingly fashionable, humanity needed more than a roof to be comfortable.

But that composition in roofing, in gables, in chimneys, in dormers and in what not has been carried to excess is, perhaps, an indication of healthy interest rather than a sign of decay. It is a great thing when people whose occupation in life is not concerned with architecture can differentiate between different sorts of roofs, and grasp the effect of a chimney carried up on the outside of a house. It is not a great artistic advance, perhaps; but the moment people begin to think about the art of their houses a long step forward has been made. At all events the feeling that helped overdo this useful member in the modern house—reverting once more to the roof—produced, in more capable hands, the finer artistic qualities in which the real strength of American country house architecture unquestionably rests.

And this artistic element is, first of all, an artistic appreciation of composition, of massing, of arrangement, of outline, of grouping of parts, of subordination of detail, of careful scrutiny of the whole work. It has been the obtaining of effects in architecture by architecture itself, without dependence on ornament or decoration or other accessory parts on which American architects, and many architects not Americans, too much depended in the past, and on which they still depend in certain classes of buildings. The substitution of building for ornament, of architecture for decoration, of mass for detail, amounts to nothing less than a return to the first principles of architecture, and the extraordinarily interesting results obtained under it, often artistic, frequently beautiful, are the greatest triumphs American architecture as a whole has yet obtained. That is, speaking from the artistic standpoint; for American architecture has made wondrous sanitary and hygienic advances in the last few years, which for general good to the human race quite outweigh artistic detail. This, however, is another story; but it is well to remember that while it is better to live in a house built and furnished in an absolutely healthy manner than in the most beautiful structure yet built that is not so characterised, it is best of all to live in a beautiful house that is provided, not with the latest sanitary devices and contrivances, for these are often faddish things that come and pass away, leaving no mark behind save the bills they have produced, but with every health-giving contrivance within reach of the builder. The artistic architect may not always appreciate what the sanitary engineer and health expert can do, but it is a distinguishing glory in American architecture that artistic and sanitary improvements have gone hand in hand.

And another strong point in this new domestic architecture of ours is that it is not confined to one part of the country. The north and the south, the east and the west, abound with examples of the best types of this form of dwelling. In the New England and eastern States they are to be found both in the smaller towns and in isolated sites. In the far west, in Chicago, in St. Paul, in Minneapolis, in Denver and other great western cities the conditions of urban life are such that the city house itself partakes of the suburban character; and while the most interesting examples are not to be found in the west—though many beautiful houses have been built there—the opportunities for this sort of building are greater there than in the east. These buildings are the work of many hands, and they are a striking commentary upon the wide application of artistic ideals to the domestic dwelling by the architects of America.

Boston has, in truth, produced a school of architects skilled in the artistic designing of the country house that can scarcely

be matched in all America. The suburban nature of the towns immediately surrounding the metropolis of New England, and the ample opportunities afforded thereby, doubtless acted as a special incentive to the production of this style of building. The development of suburban towns near other great cities in the east has further helped in the same direction, while the influence of such communities as Lenox and other resorts in the Berkshire Hills, and of Tuxedo in New Jersey, has enormously encouraged the development of the finest grades of country architecture. It goes without saying that much of this building is costly; artistic houses, like artistic pictures, are expensive; but there is still a vast amount of building that comes within ordinary expenditure in these country houses that is endowed with a great deal of taste and beauty, and which in its effect is entirely able to be classed with more pretentious houses. So widespread is the movement, and so essential is some attempt at "art" now looked upon by even the ordinary builder and his speculative brother, that many new towns which have been developed under the movement countrywards now announce in their prospectuses that only buildings of a certain architectural standard (?) will be permitted within their limits. It may not result in a distinctive raising of the artistic quality of house-building in America, but it is a straw that points current tendencies toward improvement. Fashion has not always been kind to architecture, but in this respect, at least, its influence has been beneficial.

By its importance in number and in example the country house naturally takes the first place in the development of artistic composition in American architecture. Whether the artistic revival actually took root in this form of structure or not is immaterial. Here American architects have found their most numerous and most readily available opportunities, and here they have most frequently taken advantage of them. The American country house has a position of unique value in the history of current American architecture, and not only is it of importance at home, but its extraordinary development, its positive graces, its genuinely artistic nature, are readily and eagerly recognised by foreign architects, who, neither in England nor in France, have developed a type of domestic dwelling at once so beautiful and so graceful, so varied and so charming, so bounteous in its forms, so excellent in its plan and its adaptability to the needs and circumstances of modern life. Nothing is more dreary than the average modern French small country house, which is often scarce more than a covering to the people it shelters. It is only when the French architect has a large scheme to work out, a costly château to build, that he produces a design of any interest. In America, however, it is a notable fact that much of the best work in the country house has been done in small buildings, where the cost has been relatively limited and the size moderate, the whole coming within the possibilities of people of moderate requirements.

From the country house it is but a step to the suburban and the demi-detached house of the city and the larger towns. In fact, so closely do they approximate that in many instances the difference is more one of location than of design. This is a phase of architecture with which almost every great city in the country, save New York and Philadelphia, is thoroughly familiar. The opportunities for artistic design in the suburban house are almost as large and as varied as in the country house, with which, as has been hinted, it is so closely connected as to be scarce more than a modification. There is a world of hope in these buildings, for they indicate the handiwork of the trained architect. The town builder and carpenter—who, strangely enough, are kept alive by the publication of books and periodicals nominally printed in the interests of architecture, but really doing the artistic architect a great deal of harm by creating the impression that good buildings may be made by copying indifferent plans, and that, in truth, the architect is not needed at all—are fast disappearing from the conduct of important undertakings in building. They have not yet loosed their hold upon small buildings, it is true; but no one now thinks of putting costly work into such hands. That is one of the minor results the artistic movement has accomplished, though it is a survival that has not yet been wholly eliminated from our architectural system.

The results of this change of method have been most successful, for without trained architects there could have been no successful artistic revival. As in the country house, so in the suburban, the most noticeable result has been the subordination of detail of mass, the obtaining of effects by wall surfaces and by the simplest use of the simplest materials, all applied in a sensible manner to sensible purposes. The value of mass in modern buildings was first made clear by Richardson, but the clumsy heavy walls of rough work affected by that architect have long since passed out of general use in America. Not without a struggle, it is true, for the success of Richardson's work was so tremendous that a widespread and often unfortunate copying and following after him naturally resulted from it. The men who copied Richardson's style, however, fell, as many others have fallen, into the mistaken notion that in copying forms they were copying ideas. The innate artistic

value of Richardson's work thus quite failed to appear in the work of those who mistook roughness and large materials for genuine art. The good sense that necessarily dominates domestic architecture finally recognised the value of surface in design without the roughness and eccentricity that Richardson himself used so much, and which in his hands was a very different thing from what it turned out to be in the hands of his would-be followers. Thus it happens that the most noticeable element of strength in the most artistic of recent domestic work is unadorned wall surface. Ornament and decoration are given naturally subordinate positions. The building speaks for itself as a building, and not for its value as a medium for the display of architectural variety. We do not have this in every good work, it is true, but we do have it in much that is good, and its value and the appreciation of it are growing day by day.

The great lesson taught by the best new domestic architecture in our cities and in our country houses is simplicity. The artistic in architecture is not synonymous with multiplicity of ornament, with an overburdening with "art," spelt with a very large A and put in quotation marks, nor with endless variety. Composition and arrangement and feeling will accomplish more and with less apparent effort and with more permanent results than the most prodigal display. A striking characteristic of much of modern building is its lack of permanency. No building grows old so soon as a new building; like the small boy of the present generation, it becomes old and faded out before its elders show sign of increasing years. Our buildings are apt to be designed in the fashion of the hour, in accordance with the taste of the day or under the inspiration of the latest fad. Architecture for architecture is a cry the meaning of which is only now becoming understood. Already considerable advance has been made in this respect, and in no department of building is it more noticeable than in the dwelling-house. If our houses are less "pretty," as is frequently the case, they are more artistic. The difference is a great one, and exactly expresses the relationship between amateurism and artistic perception.

The dwelling-house, and more especially the country dwelling, is the form of building in which American architecture has made its most pronounced artistic success. Its progress here has been real and marked, and its future development must be watched with the greatest interest. There is a freedom from restraint in designing a country house that admirably falls in with the beauty of its situation. Artistically, it is the greatest distinction American architects have achieved, that they have so admirably solved this one problem. There is still much to be done before the same quality will have penetrated to other fields of labour. In many other groups of buildings much progress has been made, and an architect who has in the dwelling given evidence of artistic ability is quite likely never to fall back into an inartistic mood when undertaking other problems. The artistic dwelling points the way for similar improvement in other fields. A movement so widespread as to include the country house and the town mansion, the church, the commercial office building, and even the storage warehouse, the railroad station and other utilitarian structures is not to be despised. Rather there is lasting hope in it for what is to come, and it may not be too sanguine to hope that we already stand upon the dawn of the day when the artistic architect and artistic architecture shall dominate the buildings of our land and time as once they dominated those of past times. It will not be for the same reason nor in the same manner as in the past, nor will they do their work with the same forms nor apply them in the same way; but they will modify them in compliance with the conditions of American life and work, and thus accomplish, with the aid of the spirit already astir among us, all that the most artistic architecture of any epoch accomplished. The movement, which has long since passed the earlier stages in the dwelling-house, must before long spread to every phase of building.

A VISIT TO OLYMPIA.

A CORRESPONDENT of the *Manchester Guardian* writes:—No part of the Peloponnese is more accessible to the traveller than Olympia; the train takes you thither from Patras in five hours. The journey is an easy one, for this part of Elis is wonderfully flat, and for some distance the railway follows the line of the north-western shore. You pass Dyme and other sites familiar by name to students of Achaean history. Very soon the towering range of Erymanthos comes into view, with its long snowy summit. To an eye accustomed to Grecian scenes every roadside station, with its groups of people, the shepherds in white shaggy coats and capotes of wool, elder men in gay fustanella, peasant women with their simple kerchief-snood and their queenly gait, the lad selling wild asparagus—all seem to form a charming picture. It was dark when we reached Olympia, for Greece has no twilight, and frogs croaked as a noisy welcome from the roadside pool.

A friendly guide with a lantern led us up to the little hotel above the Altis, where we were to spend two nights. It is very plain and homely, but clean and comfortable. On the walls are fading photographs of the German explorers—Curtius, Adler and the rest—who made the great excavations in the years 1875-80.

We were awakened early next day by the tinkling of sheep-bells, and were eager to visit the ruins. The view, looking down to the south-east over the valley of the Alpheios, is a fine one. There is nothing, indeed, stupendous, nothing to overpower. There is the pleasant Kronos hill, green with grass and shady trees, rising above the Altis. The Kladeos, with its deep-cut channel in the soft alluvium, hurries to join the Alpheios hard by. All the hills that rise in broken form on either side of the broad river valley are of soft, crumbling rock, green and well wooded. The general impression is that of peaceful agriculture, rich lands and green fields. The prevailing colour of the friable rocks, where they are visible through the verdure, is a greyish brown, but exposing here and there a broken surface of white. To a visitor from Athens it must have seemed a land of paradise after the barren mountains and rocky roads of his native land. As you look down upon the Altis it strikes you as strangely small. But when you cross the little wooden bridge that spans the Kladeos and enter the famous precinct, you soon find by walking how large is the space and how great the distance from point to point. By degrees the eye becomes acquainted with the scale, the largeness of which is disguised by the vast breadth of the Alpheios basin. For the Alpheios is a wasteful and squandering stream. Rising in the Arcadian mountains near Megalopolis, and receiving many tributaries on his way, he rushes through Elis in a turbid, sweeping course, claiming for his bed a far wider range than his usual volume demands. Anciently the course of this vagrant stream was governed near the Altis by waterways and dams, and when, later, these were neglected and disused, the river found its way into the precinct, flooding it with winter rains, until the ruins of the old temples and treasures were entombed beneath 20 feet of alluvium. All this mass is now removed; the patience of the Germans has laid everything bare, down to the original surface-level. Everything can now be seen. Temples great and small, gymnasium, palaestra, treasure-houses, dedications and statue-bases, all are there—not of course entire, but all *en situ*, exhibiting here a few feet above ground, here a course or two of masonry, here a column standing complete, and here again only a ground plan visible. At first the eye is simply bewildered with such a multitude of buildings. But presently we are able to distinguish certain leading features. First, there stood the great Temple of Zeus in the centre; the huge drums and capitals lie all about in gigantic ruin. You can trace the ground plan clearly; you can tread the original cellar floor of black marble, and mark this very spot where the famous statue of the god, the masterpiece of Phidias, rested once upon its base. The sculpture, metopes and pediments—so far as they were recovered—have been removed to the museum. Then further to the north stands the older Temple of Hera, with a number of its rough-hewn columns fairly complete, and its cellar walls, up to 6 feet of their height, entire. Not a fragment of entablature or of metope has been found, but quantities of gaily-painted terra-cottas which formed the antique antefixæ, cornice and acroteria. As Pausanias tells us that in his day one of the columns was of wood, it has been inferred that originally the upper portions of the building and all the columns were of that material, and that as the latter decayed in the course of centuries they were replaced by columns of stone; this would account for their irregularity in form and size. The entablature was doubtless of wood and embellished with terra-cotta; this alone will account for its total disappearance. In quiet and solemn beauty this archaic temple, ruin as it is, satisfies one more perhaps than any other monument in the Altis. Then the eye turns to the row of treasure-houses, built by the leading Dorian cities, on a terrace under the Kronos hill; you ascend to them by a flight of steps older than the Persian wars. Small in scale and solid in style, but greatly varying in material, colour and decoration, these treasures, besides their utility, must have added a very picturesque feature to the Altis. Quite at the other end the slim Ionic shafts of the old palaestra attract us, and as we wander among them under the noonday heat it needs but little imagination to reconstruct the cool spaces and echoing colonnades which once sheltered the youths of Elis from the burning sun. Yonder circular ruin is clearly the Philippeion, by which the Macedonian conqueror commemorated his victory at Chæroneia. Further away is the entrance to the famous Stadion, where the foot-race was run—the greatest "event" in Greek athletics—and the other contests of the Olympian programme. The thousands who came to see came as pilgrims to a sacred place, and shared in the worship of the gods before they took their seats upon the hillsides above, under the blazing July sun, to watch the games. Every ruin we pass has a story to tell us. But within and around all these larger buildings are relics of in-

numerable dedications, inscribed statue-bases of victorious athletes, sockets of ancient stelæ on the temple steps, between the temple columns and everywhere else. Most interesting, perhaps, is the triangular base of the "Victory" of Pæonios, and the base (*in situ* within the Heræum) of the Hermes of Praxiteles.

This statue, with the rest of the sculpture found in the ruins, is now in the museum that crowns the hill above. It is a cool and pleasant retreat from the intense heat of the sun without. The smaller cases contain the little bronzes; but the most important of these have been lately sent to Athens to form part of the bronze-room which is now being arranged at the central museum. The architectural terra-cottas are collected in the corridors. But what strikes us most are the pedimental sculptures from the great temple, so well known to us by photographs and casts. But the noble head and figure of the Apollo forms the centre of the one pediment, and the gracefully significant pose of the Kladeos in the angle of the other has a force and a beauty in the original which no reproduction can convey. Close by there rises the "Victory" of Pæonios, bearing witness in its flow and force how much its maker had learned of Phidias; but the face is sadly broken, and so is the sail-like scarf behind, and we feel that the figure, beautiful as it is, lacks the genius of the Athenian master. The famous Hermes has a room to itself. We stayed long to study and admire. The lighting of the room could be improved, and one wonders why, if the legs of the statue may be restored (one foot, of course, is original), the arms should not be restored likewise. Surely it were better to leave the original untouched and to restore the statue completely in plaster only. We know now for certain that Hermes held out a bunch of grapes to the infant wine-god. The museum from outside looks gaudy and garish, and its colour and decoration form a harsh contrast to the mellow and tranquil tenderness of the surrounding landscape. Archæology seemed to have more here of the curious spirit of science than the subtle sympathy of art. For, indeed, the impression left by Olympia upon the mind is a sweet and sombre calm. You forget the glories and excitements of those ancient days, the rush of chariots, the crowds of pilgrims, the rivalries of cities and of kings, the wealth, the splendour and the pride of that vanished world of Greece. The scene no longer speaks of these; their day is past. Nature now has resumed her sway and reigns supreme. The grey, crumbling hills, the rich woodland, the rushing streams, the corn and the grass, these fill the landscape. As you walk among the excavations it is like treading amid the ruins of some ancient cathedral or abbey, so tender, so quiet is the scene. It was not so when Germany had but lately finished her task; then all was white and clear, and told its tale with scientific precision. But now the grass makes a carpet everywhere, and flowers peep round every fallen stone. Each footstep stirs the fragrance of wild lavender or of thyme, and the deep crimson anemones look up at you with darkling eye. It is not a matter of sentiment, but of fact. The porous stone, so full of shells, of which the temples are built, has lost or is losing the stucco which at once afforded protection from weather and opportunity for coloured decoration. The rain soaks in without hindrance, and dooms the whole to ultimate decay. For ruins, like buildings yet unfallen, have their destined life. Time tells on them at last, and the moment surely approaches when the ruin becomes indeed a ruin, and the form and colour of the past can no longer be recovered from the relics that survive.

THE SCULPTURED STONE AT ROSEISLE.

THE following letter from the Earl of Southesk appears in the *Scotsman* :—

Some weeks ago I received from Dr. Cramond a notice reporting the discovery of a sculptured stone in a "prehistoric grave at Roseisle," and recently he has favoured me with a full-size drawing of this stone—the devices on the back taken by measurement, those on the face from a rubbing. Accompanying the drawing was a ground plan of the grave, with a letter from Mr. Dawson, the discoverer and careful preserver of these relics of antiquity. So clear and precise is the information thus supplied, that I feel myself warranted in offering a few remarks (trusting they will not be unacceptable) on the characteristics of the symbolism which this stone presents, though aware that inspection of the original frequently leads to changes in opinions that have been founded on copies however carefully prepared, or even on casts, photographs and rubbings.

The Roseisle stone is characterised by several very remarkable and perplexing peculiarities. On its face, as Mr. Dawson writes, "there is no attempt made at dressing, the edges and one end are tide-washed." So likewise is the surface, which bears on it certain natural figures—"neat and fine polished . . . rubbed out, not picked out"—viz. a large wild goose (or possibly wild swan, the treatment being slightly conventional),

standing, with its head resting on its back, and beneath it a large horizontal salmon, somewhat less in relative size.

On the back of the stone, which is "the natural bed of the stone, split off the rock either by the waves in a storm or by the agency of man," it bears incised geometrical symbols resembling those elsewhere found in Pictavia,* viz. two large crescents, one barred with a V-shaped "sceptre," the other marked in its concavity with a nearly circular notch; a large wide-lined disc, connected at the side with a wide horizontal band, and a small narrow-lined circle joined to a similar semicircle of similar size by a single straight vertical line. Regarding this last, however, I am satisfied that the semicircle was originally a full circle. By analogy it ought to be, and Mr. Dawson writes regarding this part of the stone:—"I am convinced that a piece has been broken off, as it does not show the same age as the rest of the surface." These symbols have been "picked out with a blunt tool," and from the character of the surface Mr. Dawson has no doubt that they are of later origin than the goose and salmon devices on the other side.

To economise space in dealing with subjects hard to discuss with brevity, I believe it will be the best course, in my further remarks, to enumerate seriatim the peculiarities that characterise the stone, confining comment to the explanations required under each heading.

1. *Position of the Stone as a Horizontal Sidepiece in a Grave of Evident Antiquity and in Company with Stone Implements.*—The only similar case known to me is the find (in 1834) at Linlathen, Forfarshire, when a fragment incised with the so-called "Elephant" symbol (almost certainly the Solar Boar, honoured alike by Celts and Norsemen), was discovered between the massive covers of a cist in a cairn, which was "paved with waterworn pebbles," and contained a small urn and bronze dagger (Spalding Club, "Sculptured Stones," vol. ii. p. 54, pl. 100). Regarding the date of this and the Roseisle interments, little can be predicated except that they are ancient and probably non-Christian. Stone implements were used for ages after the termination of the stone period, and frequently occur in company with metal objects.

2. *Difference of Workmanship on the Face and Back, and Apparent Reversal of Point of View for Each.*—As we have seen, the bird and fish side exhibits to all appearance the older work, and in this case the animal forms indicate the stone's true position if set on end. But if it is thus placed to suit the natural requirements, we discover, almost beyond doubt, that the geometrical symbols on the other side are then shown inverted. Among the very numerous examples of Pictavian symbolism, whether incised or embossed on monuments, or traced in caves, no such objects can be seen as independent crescents placed convexity downwards, or a V-shaped sceptre set angle upwards. Were a choice imperative, I should almost prefer to invert the goose and salmon. The stone must have been twice utilised for monumental purposes, and its appropriators on the second occasion have ignored or insulted its former inscriptions—a carelessness or malignity to which antiquarians could find many a parallel. Perhaps (like the Anwoth figures and Baginbun inscriptions) the first carvings were made on a rock or earth-fast stone, whose top was subsequently split off, as Mr. Dawson suggests.

3. *Characteristics of the Symbolism.*—The salmon is fairly frequent on Pictavian stones. The swan only appears in the cave tracings, and on two late slabs of the Christian period—very strangely associated. Of the goose, however, there is a fine early incised example at Tillytarrant, and several geese occur among the cave tracings. By the Celts this bird seems to have been held as an "unclean animal" (Wise, "Paganism in Caledonia," p. 176), but among the Norsemen it was honoured as one of the god Frey's special attributes, as likewise was the salmon. Exemplifying this, an ancient bronze knife-blade from Scandinavia bears on it a goose and a salmon, together with the (separate) discs of the sun and of the moon. The swan was sacred to the sea-god Njord—and probably likewise to his daughter, Frey's consort Freya—and it belongs to the same symbolic family as the kindred bird. Figures of wild geese abound in the very ancient rock tracings at Bohuslehn in Sweden; it is an essentially Scandinavian symbol or device. I entirely believe that the first carvings on the Roseisle stone were made by a Norseman's hand. Whoever was the worker, the design and execution are alike admirable; I have seen few things more beautiful of the kind. The wild goose especially, in its grace and noble simplicity, reminds one not a little of the art products of ancient Greece, though Scandinavian in its general style and character.

Turning to the other face of the stone, we again encounter peculiarities, apart from the question of inversion, which need not trouble us. The deep circular notch in the upper crescent is almost unique. On the Newton "Serpent Stone," one of the discs in a double disc symbol (the so-called "Spectacle Orna-

* In my *Origins of Pictish Symbolism* I have endeavoured to find the true meanings of all the symbols, but for present purposes I will use ordinary or general terms which assume nothing.

ment") is notched; and here I cannot but allude to my own theories, and remark that I suppose that figure to be the conjoined sun-and-moon symbol (which occurs on Scandinavian objects, in connection with Frey), and conjecture that the notch is a mode of designating the lunar nature of the disc thus characterised. A notched form, in size between disc and crescent, occurs sparingly in the cave-tracings and elsewhere; in those cases also, I presume, to indicate lunar character, for I view the crescentine Pictavian figure as solar, as the symbolic axe-blade of Thor, the thunder-god.

Unique likewise is the left-hand terminal of the V sceptre, in its tridentine form. It is a strange fact that we seldom, if ever, find identical forms of sceptre-terminals in any two cases, nor even in the terminals of any single example, save where these happen to be mere careless sketches or tame conventionalisms, as in some late Christian specimens. I therefore suspect that these terminal figures concealed definite meanings, whether as words or symbols it would be idle to conjecture.

The large circular figure beneath the crescents is rendered difficult by the presence of the horizontally projected bar at the side. With this adjunct it resembles the object known as the "mirror-case" (on my view, the sun-disc, an attribute of Frey), so common on the Pictavian stones, but here laid flat instead of rising vertically above its stand. I incline to think that it has been thus shown because (in the present unique example) a double-disc symbol has been employed as a pedestal in place of the common stand for some very special reason, the bar at the side being added to mark the nature of the large circle, which otherwise might have been taken for a "ring" symbol, or for a non-handled "mirror." If we do not admit the original circularity of the semicircle at base of the small figure, the object, instead of being viewed as a double-disc symbol, will appear to be the equally common "mirror" symbol—my "moon mirror," sacred to Frey's consort Freya.

Beyond these necessarily incomplete remarks I can offer, I fear, but little tending to serve towards the solution of the Roseisle problem. I will merely add, as the expression of my personal opinion, that nothing specially obliges us to attribute an abnormal ancientness to the grave or to the memorial-stone. For reasons elsewhere assigned (*v.* "Origins of Pictish Symbolism"), I am inclined to assume 450-600 A.D. as the period of the incised pillarstone symbolism. Accepting this, we might suppose that Scandinavians engraved the goose and salmon some while before the earliest of those dates, and that men of another race (possibly half-Celt, half-Norsemen), utilised it for their own purposes in the fifth or even the sixth century, and yet after this there would remain centuries enough for the final appropriation of the stone by some sea-roving or indigenous tribe, ignorant of Christianity and persistent in its use of primitive implements and antiquated modes of burial.

ST. GEORGE'S HALL, LIVERPOOL.

THE subjoined scheme for the sculpture decoration of St. George's Hall, prepared by Mr. T. Stirling Lee for Alderman Rathbone, inspired the report submitted to the Liverpool Corporation:—

At your request I am forwarding you a complete scheme of the sculpture decoration for the above building, that some record may be kept of the thoughts and ideas that have developed since my connection with the work. That a report is most necessary was clearly brought home to me when one of the leading citizens asked, "Where are the niches?" and on being told there were no niches but many bases, he had no idea that these bases and pedestals were for sculpture.

Perhaps an illustration drawn from the sister art of music will bring before us more clearly the unfinished condition of St. George's Hall at the present time. Suppose, for example, during the performance of the "Messiah" the conductor had to stop the orchestra continually to explain, "There is a solo to be written here," and, again, "Here a chorus," "Here a quartette," in fact, all through he had to interrupt to explain the unfinished parts, one can imagine the irritation of the audience. St. George's Hall is exactly in this unfinished condition from the architect's and sculptor's point of view. St. George's Hall, in musical language, is the realisation of the wish of one of the greatest composers, viz. that he should have four orchestras and four choruses playing simultaneously. On the hall you have solos, choruses, quartettes on the four sides of the building, only two of which choruses are written, "The Pediment" and "The Progress of Justice" (the panels).

To be sculptured there are two equestrian figures; twenty-two panels, six large and sixteen small; four groups, twenty-eight statues and twenty-eight bases for ornamental carving, as designed by Elmes. All these remain to be sculptured before the architect's design will be complete, and St. George's Hall made one of the grandest buildings of all time—a memorial of the greatness of the nation.

One must approach any scheme of this grandeur with the

full knowledge of the reason and purpose of the building; also with a clear conception that the name of St. George makes it of more than local importance, and it becomes the voice of a prosperous city to honour its country. Firstly, we find two equestrian pedestals at the base of the building, flanking the whole structure; the reason, architecturally, is that to avoid weakness the eye should run from the colonnade on the south side to the colonnade on the east, round the base of the equestrian figure, to give the effect of the building being square at the base; for the light and shade composition it is necessary to have this sculptured figure, that the scheme may run through the building by connecting the pediment, capitals, figures, panels, right down to the base, and the lines of the horse are best from the point of view of composition of line. The material to be used—bronze—fulfils this object, which will give the dark note necessary to the composition of light or shade, and give solidity to the whole. What subjects should be used for these two equestrian groups? One cannot help feeling the appropriateness of "The Winged Dawn and Evening," "The Morning and Evening of Life," "The Beginning and End of a Nation's Day," and keeping in mind one continuous thought—this to be the key of the subjects written on this national monument.

We follow the design on the east side, and we come to the series of panels on each side of the portico. These are intended architecturally to bring the eye up and down the building and along to the centre; also, for the light and shade, it is necessary to have some half-tone, which is obtained by relief carving. The subjects for these series of panels should be "The Growth of Justice" and "National Prosperity." These two enrichments we find carried through the whole side of the building, connected by the statues on the pedestals under the portico, the subjects for which no doubt should be to honour the sons of Liverpool who have brought honour to her. Over these panel friezes we find twelve bases for figures. The reason for these is quite clear—that the eye should follow along the panels up to the figures, and by the means of these carved stones tie the carved capitals and carved bases; also to give beautiful notes of light, breaking up the depths of shadow made by the recess behind them. The number being twelve, suggest the Twelve Stones of the City, the Spirits of Light and Virtue governing and inspiring Justice and Progress.

Continuing the upward growth, you stop on two smaller panels on the corners of the building, for the reason you must have some enrichment, some carved shadows, that your eye may pass from the figures round to the pediment on the south side, and up to capitals and round the building on the apse end. The subjects for the corner panels—the scientific discoveries of the present age—seem appropriate. By coincidence, round the concert-room facing the art gallery, the museum and the library we have nine panels, which at once suggest the Nine Muses, flanked as they are by two panels for music and nature.

On the south end we have the pediment, here most rightly looking on the river and docks. We find the reason of Liverpool's prosperity carved in stone, "The Triumph of Commerce," and on the west side, facing the city, we find bases for figures which perhaps are more necessary to the building than any other. On quiet inspection you can see what a wonderful improvement these figures would make between the columns, and the subjects one would wish to have facing the city, as they do, would be the attributes of municipal government.

The architect now concentrates his design on a centre roof, covering the large hall, and this roof he joins to the outer structure by means of four pedestals and groups. One can see the reason for these groups if we look at the building from a short distance; the two parts are joined together, the light and shade connected by sculpture, enabling the eye to run from one structure to the other, making the design continuous and harmonious.

The subject of these groups should be to illustrate the part England has taken in the civilisation and colonisation of the four parts of the globe, and stamping St. George's Hall as a national monument recording the possessions of England at the time the hall was built.

We now pass quietly and beautifully all round the top of the building by means of lovely mouldings and carved ornamentation as designed by Elmes, and you suddenly have two deep, full notes of shadow on the north and south, and Elmes has said his last word. St. George's Hall remains to record the public spirit of Liverpool, and to hand down a memorial worthy of the largest and richest nation in the world.

SUBJECTS.

Equestrian Groups.—The Winged Dawn and Evening (A Nation's Day).

Panels, Two Friezes. Twelve Panels Facing the Country.—Six, The Growth of Justice. Six, National Prosperity.

The Twelve Figures above the Panels.—The Spirits or Stones of a City.

The Growth of Justice.—Panels: Childhood, Girlhood, Womanhood, Administration, Result, Eternity. Figures: The Spirit of Wisdom, The Spirit of Council, The Spirit of Might, The Spirit of Justice, Peace, Eternal Light.

National Prosperity.—Nature and her Children, Agriculture, Manufacture, Commerce, Unity, Prosperity, Industry, Patience, Truth, Energy, Love, Progress.

Pediment.—The Triumph of Commerce.

Panels round the Concert-room.—The Nine Muses flanked by Music and Nature.

Panels on the Corners of the Building.—The Scientific Discoveries of our Time.

Figures between the Columns on West Side.—The Attributes of Municipal Government.

The Four Groups facing the Four Quarters of the Globe.—The Spread of Civilisation and Colonisation, The Four Great Colonies of Great Britain.

Ornamentation of the Top of the Hall.—The same as in Elmes's design.

I have endeavoured to give you some comprehensive scheme, trusting it is worthy of such a grand building.



Home Reading.

SIR,—The object of the National Home Reading Union is to render study attractive. The Union endeavours by all means which can be devised to interest people in reading for the sake of information and mental culture as distinguished from mere bread-winning, or the pastime which often means little more than obliterating time—an anodyne to silence activity during the intervals of work. To this intellectual mission the press has lent ungrudging support, showing that the desire of our journalists is to improve intellectual taste and to stimulate thought.

Of the various methods adopted for the furtherance of its aims, none has proved more successful than the patriotic attempt made by the Union to interest Englishmen in the history and literature, the physical geography and the natural history of their own country.

Those who attended the summer assemblies held at Buxton and Salisbury last year not only enjoyed the meetings while they lasted, but left with the feeling that they had annexed these two very dissimilar districts as a part of their mental property for the rest of their lives. This year the Union "period" comprises the fourteenth, fifteenth and sixteenth centuries, and Leamington has been selected as the place of meeting during the first week in July, since its neighbourhood is richer than any other part of England in memorials of this time.

The programme is far too long for insertion, but its general scope may be gathered from an outline of the plan upon which the lectures and excursions have been arranged. Major Leonard Darwin, M.P., chairman of the executive committee of the forthcoming congress of geographers, will lecture on the "National and International Advantages of the Study of Geography;" Professor Sir Robert Ball on "Comets;" Principal Rendall on the "Last of the Stoics;" Professor Bridge on "Shakespeare and Music;" Dr. Lawrence and Mr. Tanner give a course of four lectures on history; Mr. Marr four lectures on the geology, and Mr. Scott Elliot four lectures on the botany of the district; Dr. Braunholtz lectures on the "French Stage in Shakespeare's time," and "Guy of Warwick in Early French Romance;" while Mr. Yule Oldham lays before the meeting the remarkable results of his investigations into the history of the "Discovery of America."

Excursions will be made to Stratford-on-Avon, Warwick, Guy's Cliff, Kenilworth and Stoneleigh Abbey, Wroxall Abbey and Baddesley Clinton, Coventry and Compton Wyniates, under the guidance of Sir Arthur Hodgson, K.C.M.G., Mr. de Courcy Laffan, the new headmaster of Cheltenham, the headmaster of Warwick School, Lord Alwyne Compton, Bishop of Ely, Professor Hughes, Professor Ridgeway, Mr. Marr, Mr. Scott Elliot and many other gentlemen who will expound the history, archaeology, geology and botany of the places visited.

The Vice-Chancellor of the University of Oxford, the Bishop of Hereford, Principal Heath and others will also take part in the week's proceedings, which include not only the substantial items already named, but also many social entertainments provided with a due regard for the instincts of holiday makers. The Mayor of Leamington "receives" the members of the assembly at the Town Hall; the Earl, who is also Mayor, of Warwick and the Countess receive them at the Castle, and the headmaster of Leamington College receives at the College; while concerts and other entertainments will be provided in the Pump Room and the Jephson Gardens.

It is in its comprehensiveness and its cheapness that the National Home Reading Union differs from the learned societies. The summer assembly is arranged for those who are not experts in the subjects which its programme includes, and they are open to anyone who pays the small fee of seven shillings. The Secretary of the National Home Reading Union, Surrey House, Victoria Embankment, London, will be glad to send the programme to any who write for it.—Yours very faithfully,

ALEX. HILL.

Downing College Lodge: June 7, 1895.

GENERAL.

The Subscriptions to the church of the Sacré-Cœur at Montmartre amounted in May to 77,625 francs, making the total sum received 28,062,800 francs. The total expenses have been 27,688,474 francs.

The Library of the late Sir Charles Newton, containing the best works relating to classic art and archæology, which he was occupied throughout the greater part of his life in collecting, has been purchased by a German bookseller.

The French Academy of Fine Art has awarded 500 francs to M. Clausse for his book on "Basilican and Christian Mosaics;" a similar sum to M. Fauré for his "Theory of Proportions in Architecture;" and to M. Henri Havard for his "The Arts and Furniture."

The Leeds Art Gallery Spring Exhibition closed on Saturday. It was visited by 28,869 persons, and forty works were sold.

A Design by Messrs. Clark & Moscrop, of Darlington, has been selected by the trustees for the Fox Almshouses, Norton, Stockton-on-Tees. There were about fifty competitors.

Mr. W. Mather, M.P., has promised to present to the engineering laboratory of the University of Cambridge a 20 horse-power combined steam-engine and dynamo of a modern high-speed type, specially adapted for experimental work. The engine is now in process of construction by Messrs. Mather & Platt.

A Painting, by James Giles, R.S.A., depicting the demolition of the old gasworks, which occupied the site of the present railway station, has been presented to the Gas Corporation of Aberdeen by ex-Dean of Guild Walker. The artist was a director of the gas company.

The Fortieth Annual Exhibition of the Royal Photographic Society will be opened on September 28 and closed on November 14. The judges are:—In the Art Section—Mr. W. L. Colls, Colonel J. Gale, Mr. F. Hollyer, Mr. B. G. Wilkinson and Mr. W. L. Wyllie, A.R.A. In the Technical Section—Captain Abney, Mr. Chapman Jones, F.I.C., F.C.S., and Mr. Andrew Pringle, F.R.M.S. An illustrated catalogue will be published.

The Restored Crypt of St. Bartholomew the Great, West Smithfield, will be dedicated by the Bishop of Stepney on the afternoon of St. Peter's Day, June 29. The lady chapel, which is the last item in the committee's scheme of restoration, might have been completed for opening at the same time, but sufficient funds were not in hand. It is, however, roofed in and the windows are glazed.

The Northern Architectural Association will to-morrow pay a visit to Jesmond Dene House, belonging to Sir Andrew Noble, of which Mr. Norman Shaw, R.A., was architect, and the new tennis-court designed by Mr. Frank W. Rich.

A Bust of Bailie Mearns, senior magistrate, Aberdeen, executed by Mr. D. W. Stevenson, R.S.A., which was exhibited at the Royal Scottish Academy, has just been placed in the Aberdeen Art Gallery.

Mr. W. Hawley Lloyd, architect, has reported on the condition of Leamington parish church, which requires an outlay of 750*l*. A large amount of damage was done to the fabric of the church by the recent gale, and in addition to that the Warwickshire stone of which the church is built had so "perished" in some of the mullions and traceries that a great deal of other work required to be taken in hand before long. The matter has been referred to a committee.

The Death is announced of Mr. T. A. Sugden, architect, of Keighley, formerly of the firm of Sugden & Smith, at the age of seventy-five years. The gross amount of the personal estate has been entered as being 11,649*l*.

The Bath Municipal Buildings, erected from the designs of Mr. J. M. Brydon, who obtained the work through competition, have just been opened. The buildings have cost about 32,000*l*., and electric light has been fitted throughout.

The Death took place on Monday, at Shepton Mallet, of Mr. Henry A. Budd, architect, of Shepton Mallet and Glastonbury.

THE WEEK.

EXHIBITIONS of water-colour sketches have become popular, although it is not always easy to discriminate between the sketches and the drawings. Sometimes the former are more elaborate, and the advantage which might be gained by students and others from genuine sketches is therefore lost. As a consequence suspicions arise which are not advantageous to artists, and it would be wise for the very respectable members of the Water-Colour Society to consider that fact. In many ways the Institute has hitherto shown more respect for public requirements, and the show of sketches to be now seen in Piccadilly has a more genuine appearance than those of Pall Mall. Among them are twelve by the late EDWARD HARGETT, an artist who was not appreciated as much as he merited. Mr. GREGORY, A.R.A., contributes a sketch which is almost a picture of a child in the midst of a field of yellow corn, and which shows the artist's defiance of prettiness in the expression on the face. Mr. WHYMPER suggests that Greenwich at low water is not without attraction. Mr. NISBET has a charcoal and colour sketch, which, when seen at the right distance, is effective. Mr. ST. GEO. HARE's realistic painting of the *Crucifixion* consists of the figure of the SAVIOUR only, standing out from a dull background. Mr. CATTERMOLLE is successful with his painting of *The Power of Music*, representing a group of rough Venetians listening spellbound to a girl playing on a mandoline. There are many more good examples, especially in landscape, which is better adapted for quick representation and the expression of sudden appreciation of effect than figurework. On the whole, it is a pleasing exhibition that ought not to be missed by visitors to London.

It is remarkable how few statuettes in bronze are produced in this country, although we possess so many of the noblest examples of Greek sculpture. In Naples the reproducing of the figures found in Pompeii and Herculaneum is fast becoming a great industry, and England is probably the principal patron. Yet these figures are inferior to many which are to be found in the British Museum, or perhaps it would be more true to say entombed there, for they are unknown to the majority of people in England. The method adopted in Naples is as follows:—A piece-mould is made upon the statue itself, and from this a hollow wax statue is cast. The wax is then carefully touched up with a warm stylus. It is then filled with plaster of Paris, which forms a core, and having been surrounded with a jacket of clay it is placed in a kiln. Here the core becomes hard, the jacket becomes like a brick, and the wax is melted and poured away. Into the orifice from which the wax came the metal is poured from a crucible, the work is then chiselled and touched up, and brought to the desired colour by various processes. The metal used for the best castings is composed of 9 parts of copper and 1 of tin. Large numbers of the reproductions have been sent to London, Sheffield, Birmingham, Belfast, Dublin, Edinburgh, Preston and other towns. Is it not time for English founders to attempt some competition with more noble works?

ON Saturday last it was decided by the Académie des Beaux-Arts to award the Prix Houlléviqgue, which is worth 200*l.*, to M. NENOT, the architect of the New Sorbonne. This was the first time to employ the gift, and we are glad to find an architect selected as recipient. The condition imposed by the donor is that his prize is to be awarded to the author of some remarkable work produced within a period of four years preceding the time of inquiry. It may belong to any of the departments represented by the Académie, and consequently paintings, sculpture, a piece of architecture, an engraving, and a musical composition are alike eligible for the reward. The Prix Lehmann, value 120*l.*, which is offered for the encouragement of high-class studies in painting, was awarded to Mdlle. ELIZABETH SONREL for a water-colour drawing, *The Sommeil de la Vierge*, now in the Salon. M. LOISEAU ROUSSEAU obtained the Prix Desprez, worth 40*l.*, for his sculptured figure, *The Poisoned Slave*, which is also in the Salon. The Prix Maxime David of 12*l.*, for the encouragement of miniature painting, was given to Mdlle. CHAUCHE FOIN.

ACCORDING to the British Consul, within the last few years vast portions of Naples have been pulled down, and the former narrow tortuous alleys have been replaced by wide streets, lined on either side by handsome palaces. In order to do this great work it was necessary first to build dwellings for the poor who would be evicted from the slums which were to be razed to the ground. Buildings sufficient to house several thousand people were built in large blocks, separated by wide and airy streets at the east end of the town. Then the demolitions began, and a street called the "Rettifilo" was projected, which runs from the railway station on the extreme east to the General Post Office in the centre of the town. A great part of this magnificent street is now open to the public, and its construction has entirely altered the conditions of existence in Naples. The enormous traffic of the town (for no city in Europe, except London, has a traffic equal to that of Naples) was congested by the narrowness of the streets, and this is now at an end; access to the principal railway station is easy and pleasant, besides being much shorter and safer. But the increase of the town eastwards has in one respect been a source of trouble to the foreign communities. About sixty years ago great difficulties were made as to the interment of Protestants, but eventually, by means of Her Majesty's Ambassador to the Court of Naples, King FERDINAND IV. was induced to allow the British Government to acquire a piece of ground, which was placed in the hands of trustees, and became the recognised burial ground for Protestants of all denominations. When the extension of the town began the new buildings crept right up to the cemetery walls, and notice was given that no further interments would be allowed to take place there. The cemetery, fortunately, is the property of the British Government, and the municipality accordingly hesitated to carry out plans by which either a road would have been made through the middle of it, or the whole cemetery removed bodily. It now remains a beautiful garden, full of costly marble monuments, and surrounded by workmen's dwellings. A new cemetery is provided by the municipality.

AMONG the public works which are in contemplation in Spezia are the building of a new town hall, rendered necessary by the actual number of municipal offices (92,000 lire have been voted for the purpose) and the drainage of the town, and especially of the Viale Savoia. Another important, and at the same time urgent, undertaking which has been resolved upon, is the building of a new hospital. The present one was barely sufficient when the population of the town was far below its present numbers; and now it is not only sadly deficient in accommodation, but hemmed in by houses that have sprung up around it. The site of the new hospital has not yet been selected, but the slope of the hill crowned by the ruined castle of San Giorgio may eventually be chosen. Fifty thousand lire have been voted as an initial outlay. Moreover, provision has been made in the municipal budget for 1895 for opening up new streets, enlarging the gasworks, &c.

WHEN we find that ninety-one pictures, including old masters, were sold for 87,144*l.* at CHRISTIE'S on Saturday, it is no wonder people abroad imagine that in England any sort of coloured canvas is precious. Every season we receive applications to find purchasers for pictures, but this year they are more numerous than ever. How GAINSBOROUGH would stare if somebody prophesied that his *Lady Musgrave* would be sold for ten thousand guineas and despatched to America, or fifty times the sum he received for it. The prices for TURNER'S pictures continue to be incomprehensible, for by what standard can a scene with so little in it as the *View of the Thames from Mortlake* be judged, when it is considered worth 5,460*l.*? A far finer work, if judged by the handling, is COTMAN'S *Grand Marine Subject*, which was sold for 2,300*l.* Compared with the prices for GAINSBOROUGH'S and ROMNEY'S works, REYNOLDS' portraits realised moderate prices. The first president's own portrait, which belonged to one of his successors, was sold for 1,100*l.*, and the *Mrs. Damer*, which is rather novel in treatment, for 2,300*l.* Whether the prices have a beneficial effect on modern English art is not apparent, but too often the present has to compensate for the past.

A LOST ART.

THERE was commotion among artists and amateurs in Paris in 1752 when M. DE CAYLUS read a paper before the Académie des Belles-Lettres on the encaustic painting of the ancients. During eleven centuries that process was forgotten by all, and it seemed doubtful whether any research could explain what encaustic was to a Greek artist. CAYLUS at the time was in an anomalous position. It was doubtful whether he was a professional engraver or a connoisseur. REYNOLDS, in describing a study of RAPHAËL, said a print from it by Count CAYLUS was in every hand, a testimony to the popularity of his engravings in England. Originally the Count was a soldier, and he gained experience in the French wars. When peace was concluded at Rastadt he "went in" for art, and he studied not only pictures in Italy but the remains of architecture in Greece and Asia. On his return to France he applied himself to the engraving of plates of medals and precious stones in the royal collection. He was considered to be qualified to become a member of the Academy of Painting and Sculpture. Soon afterwards he was elected to the Academy of Inscriptions. When he read his paper on the ancient process CAYLUS was accordingly known to be a scholarly student, although his chief works appeared subsequent to his posing as a revealer of the lost art of encaustic painting. In 1753 he read another paper on the subject before the Académie Royale de Peinture. The following year he went further, for at a public assembly of the Académie des Belles-Lettres he exhibited a *Minerva* by VIEN, the greater part of which was in encaustic. For the sake of contrast a part was painted with wax which was not submitted to any operation of heat. There was no picture produced in 1754 which excited so much interest.

Obedient to etiquette, CAYLUS had not explained the process employed. Although the *Minerva* was exhibited in one academy, the description of it appeared to him to be within the province of the Académie des Inscriptions. But the artists endeavoured to pluck out the heart of the mystery without his aid. The painting was subjected to all the tests that the senses of sight and touch could afford, but it was by the smell alone that a clue to the process was supposed to be gained. There was an odour of the essence of turpentine perceptible, and it was immediately concluded that the picture had been painted with wax which was subjected to that solvent. Not one of the artists was able to speak from experience or hearsay of colours obtained in that way, however, as colours must be more or less fluid in order to be used; and, as there was an indication of turpentine, it was reasonable to suppose that encaustic signified the application of wax colours dissolved by an essence.

A few artists tried the experiment, and succeeded in producing pictures on a small scale, which were exhibited in Paris during the early part of 1755. One of those painters, named BACHELIER, was not satisfied with what he had done. He also employed soap with the wax, and found he gained more body. After he had used paints made up in that way, he tried the effect of heat on the picture, and as they did not vanish, BACHELIER concluded that he had succeeded in rediscovering the old Greek process of encaustic. Examples were shown in the Salon of 1755. They appeared like engravings to which dirty colours had been applied. But the French were always partial to colours deprived of brilliancy, and BACHELIER'S name was prominent for a short time.

An effort was made to gain for him, instead of CAYLUS, any credit which was to be derived from the attempt to revive encaustic. It became a case of turpentine *versus* soap. ROUEL, the chemist, was said to have ascertained that the Greeks used soap, and from him BACHELIER obtained the hint. CAYLUS'S essence of turpentine was not, therefore, warranted by classic authority. It was overlooked that in none of his papers was the essence mentioned, while he described three or four ways of treating wax. Then it was tried to be made out that in 1749 BACHELIER by accident had discovered the utility of the essence, and had painted a picture in which it was used, but had afterwards abandoned it and substituted soap dissolved in water. He therefore claimed to have priority of CAYLUS in the discovery. Nothing was gained by the controversy, for, in

spite of all that was spoken and printed, encaustic painting could not win favour in Paris as a novelty or as a resuscitated art. Nor were subsequent attempts in Florence by PARENTI and FABBRINI more successful.

BACHELIER'S attempts must have frustrated the scheme of CAYLUS. The Count evidently supposed he had discovered a source of wealth. At first he acted as if the idea of revival were his alone. Then it was admitted that a physician in Paris, named MAJALTY, had co-operated with him. The method proposed to be employed by them was kept secret as long as possible, which suggests that financial success was sought rather than an increase of knowledge. BACHELIER, on the other hand, was too communicative, and his descriptions of his experiments afforded opportunities to the wits to exercise their ridicule, and what was said was taken to be no less applicable to the discoveries of CAYLUS and MAJALTY.

It was remarkable that more about encaustic could be derived from the references by PLINY and VITRUVIUS than from the essays of the rival discoverers and their supporters. Wax in various forms was much employed by the ancient artists. In ANACREON'S time the word was as synonymous with painting as canvas is now. In one ode he says "Let the wax speak even in the silence," and elsewhere he exclaims "O wax, soon will you speak." It may be supposed that he was referring to wax medallions, but if any value can be attached to PLINY'S statements, encaustic painting was practised in a time as remote as the sixth century before our era, when the poet lived. As it is recorded that LYSIPPUS inscribed on his paintings at Ægina how they were produced with the help of fire, we may assume that there was no striking difference between the appearance of works in encaustic and those for which other methods were employed. In PLINY'S time small pictures on ivory were produced by encaustic, and it would thus have some relation with modern enamel-painting. It was utilised also for portraits on wood panels.

That it was largely employed in mural painting appears to be certain, and its applications may have been of various kinds. VITRUVIUS, as if by accident, refers to one of them in a passage of his seventh book that has become familiar. When speaking of the difficulty of preserving minium or vermilion from turning black after a few days' exposure to the sun, he mentions the practice of some careful people. After the colour was laid on evenly and was very dry, they covered it with Punic wax mixed with a little oil, which was spread with a brush. Then a brazier with lighted charcoal was brought in contact with the painted wall, by which means the wax was melted. Lastly, the surface was polished with a candle and cleaned with cloths as if it were a statue of marble. The coating of wax was a preservative against the influence of sun and moon. As Sir HUMPHRY DAVY in his researches among the ruins of the Baths of TITUS could find no trace of an encaustic varnish over the painted ornament, while on plain surfaces a reddish hue was visible, he concluded that the encaustic work which VITRUVIUS described was only applicable to walls which were not decorated with figures or ornament in fresco. It is maintained by other investigators that an encaustic varnish was likewise laid on fresco paintings and that it had the effect of heightening the colours as well as preserving them.

That the encaustic process was adopted in several ways is as certain as any antique practice which we accept as true. There are too many references to it to leave any doubt on the subject. The figure of the lady painter and the grotesque of the portraitist which were found in Pompeii do not show that "cauteria" and "ceræ" may not be included among the materials depicted, but on the other hand many writers mention wax colours and the apparatus for burning them in. They are said to have been carefully kept in closed boxes with partitions. What proportion of wax was employed is unknown. The utility of it is also doubtful. The ancient painters were not oil painters, they used gums, resins, bitumens, glues, &c. Wax may have helped to give consistency to the coloured earths. But so much importance would not have been attached to it unless it was more useful, nor so much labour expended on the bleaching and purifying it. Wax may have imparted a softness to colours by which they became more vivid when employed in flesh painting. In that way the poet's admiration of wax pictures

would be understood. According to PAUL DE KOCK, the young Parisians of his day preferred wax figures to marble statues, and a similar weakness was likely to have been known in Athens and Rome.

It was not every painter who could work with wax colours, at least in the palmy days of art. In the period of decline and among the artists of the Lower Empire, wax and cauterising appliances were supposed to be among the contents of ordinary studios. This is evident from the law books. It is laid down that when a painter devised his atelier or studio, it was to be assumed that he included the wax, colours, brushes, *cauteria* and the pots that were necessary for mixing colours. In fact, the words "*pictoris instrumento, ceræ, colores, penicilli, cauteria, conchæ et temperandorum colorum vasæ*" became a sort of stereotyped phrase in legal documents.

The greatest difficulty of all connected with the subject is how the cauterising or burning produced permanency of colours. When OVID describes the prow of a vessel as representing the Mother of the Gods in colours which were burned, he must have known that by the process pictures capable to withstand winds and waves were obtainable. PLINY also mentions that when wax colours which were rendered liquid by fire and which could be laid on with a brush, were used on the outsides of ships, they became so solid that neither the sun nor the salt of the sea nor storms could affect them. Modern colourmakers could not expect to accomplish a similar feat with any wax which is now to be obtained in the market. The application of heat could not achieve permanence with ordinary wax, which must have undergone some change in the preparation, or it was united with another material which developed into an enduring substance when heated. PLINY says distinctly that with the paints which were used to adorn the exterior of vessels brushes were used, and consequently we are justified in concluding that one part of the process did not present extraordinary difficulty. Where skill was needful would be in the preparation and selection of the paints, and in the use of the implements for burning them.

An older method, according to PLINY, was to employ a *cestrum* or *viriculum*, which would be a sort of graver. It could only produce lines, and his words may then be interpreted as meaning etching or engraving on wax. The lines could be filled in with colour, and the slab hardened, assuming that cauterising always produced the effect. But PLINY in the same sentence mentions ivory. "Formerly," he writes, "there were two classes of encaustic, which were made with wax and upon ivory by the *cestrum* or *viriculum*" ("*cerâ et in ebore, cestro, id est, viriculo*"). Whether he intended to suggest that encaustic painting was accomplished on ivory plates without the aid of wax must be always a subject of controversy.

If the experiments of the Frenchmen in the last century were carried on with perseverance and with more co-operation between painters and chemists, it might now be easy to give a more definite meaning to the words of Greek and Latin writers when describing encaustic painting. The members of the Academy of Painting were annoyed that CAYLUS and MAGAULT had not revealed to them how the *Minerva* was produced. They scorned to take the information from the proceedings of a mere literary academy, and the explanation that it was supposed to be especial business of the latter to deal with all matters relating to the arts of the ancients was adding insult to injury. Since that period the subject has not attracted investigators, and as there is no advantage apparent from knowing more about the ancient practice, encaustic painting is likely to remain among the lost arts.

PROGRESS IN EGYPT.

IF the rate of progress in Egypt were to be determined by a comparison of the ancient buildings of the country with any which could now be erected, few would hesitate to say it must be infinitesimal. Perhaps it would be safer to admit there must only be retrogression. The architectural standard is, however, more often applied than is commonly supposed, especially by imaginative critics in the form of French statesmen. Egypt was at one time they think in a condition when the sublime in architecture

was reached; under fitting rulers, such as themselves, those happy days would be restored. Under English domination the colossal has to give way to the comfortable. A great deal is supposed to be attained when it can be recorded that in Cairo there is "marked development, as attested by new streets, handsome buildings, well-appointed shops, brilliant equipages, prosperous-looking natives and other evidences of progress," that Assouan has developed very much indeed because "numerous fine houses have sprung up, including a handsome hotel," and that in Esneh there is a school having "large coloured cartoons on technical subjects, illustrating various trades, such as bread-making, cooking, weaving, tailoring, hat-making, laundry-work, printing, &c."

The PHARAOKS would scorn signs of government in those forms. If compared with the results of the ancient system the cartoons, hotels, excursion parties, sugar machinery, cotton mills, &c., must appear mean. If we credit HERODOTUS, the Egypt which he had traversed contained twenty thousand populous cities, and Memphis was not only as large as London but possessed more magnificent buildings. A visitor is now puzzled when he looks on the natives and remembers that similar men—for the painting and sculpture afford evidence of their relationship—piled up the temples and pyramids. But they were no less remarkable in war than in the arts. The Greeks with all their heroism succumbed to the Egyptians, and other races are to be excused when they also were conquered by the slim soldiers from the Nile Valley. Modern engineering can do little more than imitate the system of the Egyptian engineers. Before ABRAHAM and his famine-stricken band were forced to seek food in Egypt, the overflow of the Nile was stored in Lake Moeris until the time when the river was running dry, and then the reservoir was opened. For the improvement of the country modern ingenuity can devise no better arrangement. A water-supply that could be regulated at will is the dream of all who love Egypt, and many a year must elapse before it can be realised. The need is so oppressive, we need not wonder if occasionally it overcomes the respect for ancient architecture.

In spite of all shortcomings, there is progress in Egypt since the country, happily for itself, came under English guardianship. The extent may be judged from the report of Mr. VILLIERS STUART, which has been issued as a Parliamentary Paper. He is well acquainted with the country. Twelve years ago he was attached as a specialist to Lord DUFFERIN'S mission, and conducted an inquiry into the state of the villages throughout Upper and Lower Egypt. His report was published. By a comparison of the two reports it is not difficult to realise the extent of the change which is due to English inspiration. Probably in no other country are so many beneficent results to be witnessed from the operations of a few years' government. Mr. VILLIERS STUART has probably often wished that a corresponding change could be witnessed in his native Munster, which presents so many points of similarity with Egypt.

Twelve years ago there were as many antique grievances in Egypt as the most enthusiastic archaeologist could desire. What was called justice was administered on Lord Chancellor BACON'S system, that is, sold to the party who was most liberal in his payments to the judge. The revenue of the inhabitants is derived from land, and the assessment was based on surveys made by the aid of fraudulent measuring rods supplied for the purpose, and which being too short produced excessive areas. When land was taken for any public purpose no deduction was made; the fellah continued to pay on the former area. There was another imposition connected with surveying, for "sham surveyors used to go about the country armed with measuring rods, representing themselves to be Government employés, and would only leave each village on the payment of a liberal *douceur*, for the villagers stood in great dread of these pirates." The surveyor's art is believed to have had its origin in Egypt, and long practice enabled the representatives of the ancient geometers to make more profit out of it than is now possible in England. But of all forms of oppression the *corvée*, or forced labour, was performed on the largest scale. It also could claim to have the sanction of ages, and a scene which Mr. VILLIERS STUART observed in 1883 did not, we suppose, differ much

from what was practised in Egypt three or four thousand years back, and represented by contemporary artists :—

Wishing to witness with my own eyes the forced labour system in operation, I went to a place opposite the village of Ouled Ammer, where a new canal was being excavated.

A cut about 18 feet deep had been made through a conglomerate of sand and gravel; this trench was flanked right and left by high embankments, consisting of the *débris* excavated. From the summit of these ridges to the floor of the canal was from 35 to 40 feet deep; along the bottom and on the slopes right and left men swarmed thickly, like bees on a honeycomb, for a distance of about a mile in length. The overseer told me that the entire forced labour of the province was concentrated there, 40,000 men in all; that they worked from sunrise to sunset without intermission, except a brief interval at midday for a meal consisting of bread soaked in unfiltered Nile water. This bread was sent them by their relatives, and they had a meal of it before commencing work and another at night. They have also to provide their own baskets for carrying the excavated soil; they were engaged in filling these baskets with gravel (using their fingers for the purpose), climbing the sides of the cut and tipping them on the outer slope. The majority had no implements but their hands; a limited number had short picks a foot long, which they also have to provide, Government contributing nothing whatever.

The day was excessively hot, and not a breath of wind. The temperature in my cabin, with all windows open, was 82 degs. in the shade; at the bottom of that trench it was much hotter, I should estimate it at 95 degs. There was absolutely no shade. In this fiery heat and glare and amid much dust they toiled all day long. They were clad in calico, mostly reduced to rags by the work they were engaged in. They wore on their heads felt skull caps exactly like those represented as worn by workmen in Fourth Dynasty bas-reliefs. They were barefooted. Their calico rags formed their only covering at night, and they slept on the bare ground in the open air without any kind of shelter, although the nights are often very cold. Amongst them were many overseers armed with sticks, with which they often struck the men while carrying loads on their heads, without any apparent reason. Many had sore fingers and sore feet, for there were sharp flints amongst the *débris*.

I have seen negro slaves at work on the cotton plantations of Cuba, I have also seen the convicts at work at Portland; the conditions under which all these laboured were greatly preferable to those to which these Egyptian fellahs were exposed, and it must be remembered that most of them own farms, and constitute, in fact, the yeomanry of Upper Egypt.

What struck me most as I gazed on the toiling multitude was the pitiable waste of human labour, for one-fourth the number, with proper tools and appliances and sufficient food, and with intelligent and experienced foremen to direct them, could have done the work far better and more quickly than the ill-directed efforts of that mob of men without implements, weak from scanty diet and exhausted by hardship. An English navy would laugh at their work as excavators, but the conditions as to food, temperature and exposure under which they work would kill him long before the month was out. Ophthalmia is one evil that results. I cannot imagine a better recipe for the wholesale manufacture of this malady than to work men to exhaustion in fiery heat, glare and dust all day, and then to expose them all night to the heavy dew and frosty temperature, lying on the bare ground in their calico dresses.

It must not be supposed that because the Government pay nothing for it that therefore forced labour, as now conducted, is cheap. On the contrary, it is most costly to the country; every man there withdrawn from the cultivation of his farm represents a family by so much impoverished.

Under English rule forced labour is restricted to the watching of canal embankments during the few weeks when the Nile is fullest and it is necessary to provide against breaches of the embankments. In the sugar factories the labour during three months was also forced and unpaid. Now the labour is voluntary, and is well rewarded.

Although reforms are carried out which have made the people less miserable, there is much to be done which is outside the province of Government. The usurer flourishes in Egypt, and there is no competition to moderate his demands. If banks could be established that charged only 12 per cent. they would be boons, but we suppose financiers are afraid to trust the security. All over Egypt the cry is also for water; if it were abundant and obtainable when needed the usurers could be endured. When the water is shallow in depth it evaporises, and leaves a salty residuum which is most injurious to vegetation. Large reservoirs are costly. One at Wady Rayan would be likely to require an outlay of 3,000,000*l.*, but the return would be 70 per cent. In Upper Egypt there is soil many yards deep, but owing to the defective irrigation only a single crop a year can be derived from it. What is feasible can be seen in the Island of Elephantine. Mr. VILLIERS-STUART says he remembers when it was a desert; now it is covered with gardens and cultivation. But a few figures are more convincing about the future of Egypt when irrigation is undertaken on a

suitable scale than any words. Mr. VILLIERS-STUART summarises his conclusions as follows :—

The area of cultivation in Middle and Upper Egypt together may be put roughly at 2,500,000 acres. It is calculated that a perfect system of irrigation as planned by our engineers would result in raising the average selling price of the land from 33,000,000*l.* to 79,000,000*l.*, i.e. its value would be increased 46,000,000*l.*; besides that extensive tracts now desert would be reclaimed and rendered fertile. Its letting value would be raised from 5,000,000*l.* to 9,000,000*l.*; the value of the annual yield from 8,000,000*l.* to 18,000,000*l.* These are magnificent returns on an outlay of, say, 10,000,000*l.*, or even more.

The present area of cultivation in the Delta is about 2,750,000 acres. It is estimated that there are about 500,000 acres which could be reclaimed with improved irrigation. The increased annual value of the products of these lands, when the irrigation works are completed, is estimated at 3,000,000*l.* per annum. The increase in the Delta must of course be far less in proportion than in Upper Egypt, because the Delta already produces as a rule two or three crops in the year, whereas Upper Egypt as a rule produces only one now, but would then be enabled to raise two or three.

A loan of 10,000,000*l.* would enable these splendid results to be achieved. Such a loan for so excellent a purpose would be readily advanced by the bourses of Europe, but here our international entanglements interfere, and the best interests of Egypt are sacrificed.

It is unfortunate that, while the English authorities have contrived to put down so many abuses, they are powerless before the vandals. According to Mr. VILLIERS-STUART there is a "carnival of destruction" going on along the Nile in Upper Egypt. In all his experience of the country he never found the havoc which now prevails. In one place he saw "whole terraces of tombs being blasted with gunpowder, and counted six native freight boats in the act of being loaded with the stone thus obtained; equally good stone in every respect could have been blasted from the rocks close by, where there were no tombs." The Museum authorities are worse than the old tomb robbers, for the latter left the sarcophaguses as they were found, and contented themselves with the contents, but the official guardians of antiquities not only despoil the shrines, but smash them, regardless of their artistic character. In the historically interesting temple of Queen Ha to Son, at Deir-el-Bahari, of the Thebaid the upper terraces which gave it its artistic character, and were covered with sculptured panels admirably executed, have been utterly wrecked, and the sculptures which formed the breastwork of the terraces have been abstracted. Nor is the havoc less deplorable in the case of the tombs with which the hills in the neighbourhood are honeycombed. A well-known one, depicting the visit of a Soudanese queen to a king of the eighteenth dynasty in a series of tableaux, is now used to stable donkeys, and is in a filthy condition.

It is a maxim in mechanics that no chain is stronger than its weakest link. A Government ought not perhaps to be judged in a similar way. But the unrepressed vandalism will by many be taken as significant of British rule, and from such data it will be concluded that the so-called progress is only of a class with the vaunted care of antiquities which year after year is announced from Cairo.

SOCIETY OF ARCHITECTS.

THE ninth ordinary meeting of the Society of Architects for the session 1894-95 was held on Saturday, June 15, at Darenth, on the site of the Roman Villa, Mr. E. J. Hamilton presiding. The general business was gone through, and Mr. C. R. Scott, of Park House, Cambridge, was elected a member.

Mr. George Payne, F.S.A., gave an animated and learned address on the discovery and importance of the remains of the Roman Villa. In the course of this address he mentioned that discoveries had been made in the Darenth Villa which had opened the eyes of archaeologists, and would be handed down from history to history and from handbook to handbook.

Mr. E. J. Hamilton, president, proposed a very hearty vote of thanks to Mr. Payne for his very interesting address. This was seconded by Mr. H. Lovegrove, A.R.I.B.A., and unanimously carried.

The members of the Society then visited the parish church of Darenth, itself of considerable interest, being almost entirely built out of the remains of the Roman Villa, and possessing a curious font. The visit was a great success, and of the highest interest to architects.

Mar Lodge, the seat of the Duke of Fife, near Braemar, was destroyed by fire on Friday last. With a less scanty water supply some of the buildings might have been saved.

PRESERVATION OF WESTMINSTER ABBEY.

WE understand, says the *Times*, that the negotiations for acquiring the houses in Old Palace Yard, the removal of which was unanimously recommended by the Royal Commission on Westminster Abbey, on the ground that they "not only conceal to a great extent the architecture of the Chapel of Henry VII. and the ancient chapter-house, but are also a constant source of danger to the abbey from fire," are now on the verge of completion. The price to be paid to the Ecclesiastical Commissioners for the freehold was agreed upon some months ago; and the only leaseholder who was unwilling to dispose of his interest on the terms proposed has consented to refer the matter to an arbitrator. According to the present outlook, the authorities will be in a position to begin operations before the end of the present month; but, as it is undesirable that the work of demolition should be entered upon while Parliament is sitting, things will probably be left as they are until later in the year—probably until the period when men engaged in the building trade are most in need of employment.

As soon as the houses have been removed, the space cleared will be turfed over, so that the public may be enabled to view Henry VII.'s Chapel and the chapter-house under favourable conditions, and to form an opinion as to the advisability of utilising a portion of this space for the erection of a monumental chapel, as Mr. Yates Thompson suggests. In view of the fact that one-half of the Royal Commission were in favour of the alternative site by the cloisters (where the refectory formerly stood), it is obvious that the Office of Works will need more guidance before entertaining any extensive building scheme. The purchase-money and costs connected with the acquisition of the houses in Old Palace Yard is provided for in the Civil Service Estimates (class 1, vote 9), so that members of Parliament have had every opportunity for criticising the action of the Department. The sum proposed to be allocated this session is 27,000*l*.

ITALIAN ALABASTER WORK.

THE consul at Leghorn says he is obliged to warn English travellers to exercise great caution in their dealings with the alabaster shops of Pisa. The unbusinesslike habits of some of the proprietors lead to numerous irregularities, as is evidenced by the complaints which are addressed to the consulate by travellers on their return home. In some cases goods of a smaller size than those ordered are sent forward; in others, where a large order has been given, articles are missing; often months seem to elapse before goods offered are sent off, and a remonstrance from the consulate has been necessary to secure their final despatch. Doubtless abuses of the kind are more common than appears, for it is likely enough that only a small proportion of the sufferers lodge their complaints at the consulate. Travellers should, if possible, see the goods they order packed before they leave Pisa, and they should carefully ascertain by what route, and when, it is proposed to send them. One form of complaint that reaches the consulate is the very heavy forwarding charges which have to be paid on arrival of the cases in England. A gentleman living in the midland counties bought 14*l*. worth of alabaster statuary in February 1894, paying for his purchases on the spot. Even after several months had passed the goods did not arrive, and his letters to the dealers remained unanswered. A remonstrance from the consulate caused the goods to be sent off, and they arrived six months after the date of purchase, but with a sum of over 5*l*. to pay for forwarding expenses. Nearly 5*l*. of this amount was "charged forward" from Leghorn, and it was admitted by the London receiver to be excessive. In another case 3*l*. worth of goods had been ordered for a charity bazaar, and the forwarding expenses amounted to 5*l*. Travellers should try and ascertain the names of really reliable forwarding agents in Leghorn, and insist upon their purchases being forwarded by the agents of their own choice and not the agent patronised by the dealer. It is to be hoped, however, that proprietors of shops may speedily come to realise that only by promptitude, punctuality and scrupulous straightforwardness in their dealings can they hope to secure an English *clientèle* of any magnitude or importance.

Alabaster is now used in the manufacture of a new and much-needed article, viz. bell-pushes, a factory for making which has lately been set up at Pomaia. The alabaster bell-push is an extremely neat and serviceable article. It is made from fine Castellina alabaster. The alabaster blocks are first sawn into slabs, and from each slab ten or a dozen pushes are made by the application of a lathe. The pushes, after being turned, are subjected to a heating process, which gives them resisting power, and then to submersion in cold water, which tends to consolidate the stone. They then receive the artificial polish of soap and bone-dust applied to articles of the Volterra miscellaneous alabaster industry. One workman produces about 500 pushes in a day. The wholesale price is the extremely low figure of 15 c. (less than 1½*d*).

THE PROPOSED WESTMINSTER CATHEDRAL.

THE official appeal for funds for the cathedral at Westminster, of which the first stone will be laid on the 29th inst., states that at first it was proposed to reproduce the ancient basilica of St. Peter. This idea has been abandoned as impracticable. Mr. Bentley, the architect, after spending three months on the Continent, has given a ground plan which has been warmly approved by the Chapter of Westminster and by all who have studied it. The building will be of vast and stately proportions, perfectly suited to modern requirements, but not of a costly design. The object is a practical one: to provide, as Cardinal Manning said, what "is urgently needed in this great city," not to raise such an edifice as would be beyond all the circumstances and the condition of the Catholic Church in England. Mr. Bentley's plan covers 54,000 square feet. The cathedral will be 350 feet long, 156 feet wide and 90 feet high. The nave will be 240 feet in length, will be 60 feet of clear width, and there will be transepts, aisles and side chapels. In the apse, the floor of which will be raised some feet above the level of the nave, will be the monks' choir, as in Sant' Ambrogio of Milan, visible from the main entrance. The canons' stalls will be in the sanctuary. A figure of Christ crucified over the high altar will be the central feature to rivet attention. The style is Byzantine, like that of Sant' Ambrogio, with certain details suggested by San Marco of Venice and San Vitale of Ravenna. The characteristic of the building will be the great open space of the nave and transepts. For obvious reasons it has been decided to avoid any appearance of rivalry with the neighbouring minster. The quantities have not yet been taken out. The cost of the structure may be 150,000*l*.

ARCHÆOLOGY OF THE WITHERNSEA DISTRICT.

THE second excursion of the East Riding Antiquarian Society took place on Monday. The place of rendezvous was Withersea, where about forty members of the society assembled. Withersea is about the centre of that part of the coast which has suffered most from the inroads of the sea. Old Yorkshire maps used to bear the impressive words, "Here stood Awburn, which was washed away by the sea," "Hyde, lost in the sea," &c., and the devastation was reckoned to be going on at the rate of a yard a year. Very interesting it would have been to observe the old landmarks, for it is said that part of old Kilnsea Church is visible at extreme low water, and many can recollect the now defunct village of Owthorne, the last gravestone of whose churchyard may still be seen bearing the somewhat inappropriate inscription that the body below would lie there till the judgment day. Little was it surmised that one and all the bodies of that churchyard would be floated out to sea, and lie at the bottom of the ocean. Not much time was spent by the sea, the first visit paid being to Welwick Church, which was described by Mr. J. R. Boyle, F.S.A. It seems from Domesday that a church stood there at the Conquest. Leaving Welwick, the next visit was paid to the Pride of Holderness, as Patrington Church has been called. The place derives its name from St. Patrick, a sure sign of its having been Church property in early times, when the obligations of Yorkshire to the Irish saint were willingly acknowledged. The Easter Sepulchre in this church is one of the finest left in England. From Patrington the party proceeded to Winestead, the features of the church being given in a paper by Mr. Temple Moore, and dealt entirely with the architectural features of the place. The next meeting of the society will be at Scarborough Hall, on July 15. Lord Hotham has permitted some mounds to be uncovered which are believed to be the burying-places of a tribe about whom very little is known.

SHEFFIELD SOCIETY OF ARCHITECTS.

THE members of this Society have made quite a new and attractive departure. In addition to the valuable and instructive lectures, they have commenced a series of excursions to places of historic interest in the neighbourhood. Through the good offices of Mr. Benjamin Bagshawe (lay member) they were permitted by his Grace the Duke of Devonshire to go through Hardwick Hall. The party left Sheffield at 9.45, and on arriving at Heath were conveyed in carriages to the hall. There were present Mr. Charles Hadfield (president), Mr. C. J. Innocent (hon. secretary), Messrs. B. Bagshawe, E. M. Gibbs, J. Smith, T. Winder, H. W. Lockwood, T. H. Waterhouse, J. P., F. Ward, J. T. Cook, C. F. Longdon, J. B. Mitchell-Withers, J. E. Benton, J. Norton, C. B. Flockton, H. Webster, W. F. Hemsell, F. Callis, C. Gibson, C. F. Innocent, R. J. Wigfull, H. Dawson, E. C. Skill, T. Whyles, O. Bromley, C. Ellis, G. E. Turner, S. L. Chipling, F. Wilson, F. Barker, G. F. Davy, J. C. A. Teather, J. V. Woofindin, S. Bonney

(Melbourne), J. Haigh (Holmfirth), and C. Goodier. The party assembled in the great hall at Hardwick at 12.45, and under the guidance of Mr. Bagshawe were conducted through the house. For many years Mr. Bagshawe has been a student of the hall and its contents, has been allowed to examine its muniments and everything that can throw any light on its history, and his explanations, historical and descriptive, of the building and of the many objects of interest which it contains were greatly appreciated by the members. Mr. Bagshawe pointed out various objects especially deserving attention among the pictures, the furniture, the tapestry, &c., calling notice particularly to the portrait of Lady Grace Talbot, which, in his opinion, contained a representation of the ancient gateway leading to the castle in Sheffield; and also to the portraits which have been misdescribed as the Earl and Countess of Shrewsbury. They were evidently intended to represent the father and mother of Lady Arabella Stuart. Mr. Bagshawe also exhibited to the members the accounts kept by the Countess of Shrewsbury of the furnishing of the hall—the cost of the various articles, even to the brass candlesticks now on the walls, and the names of the persons who supplied them—the whole written in a bold masculine hand. He pointed out that the character of this remarkable lady had been greatly misrepresented by historians, including the Rev. Joseph Hunter. From a careful investigation of books and papers, he had come to the conclusion that in addition to her great capacity for business she was generous, and a woman of strong natural affections; and that in the disputes which had arisen between her and her husband, the balance of evidence tended to show that he was wrong and she was right. Before leaving the long hall, with its unique collection of historic portraits, Mr. Bagshawe was, on the motion of the president, seconded by Mr. Innocent, and supported by Mr. Gibbs, cordially thanked for his kindness in having obtained permission for the visit, and for having accompanied the members, and the vote was acknowledged. The party were taken through the gardens, and before leaving the grounds Mr. Bagshawe proposed that their thanks should be given to the Duke of Devonshire, and the motion was seconded by Mr. F. Ward, supported by Mr. T. H. Waterhouse, and carried with acclamation. Tea was partaken of at the Hardwick Inn, and before leaving for the station Mr. C. J. Innocent was very cordially thanked for the admirable manner in which all the arrangements had been carried out, and which had contributed so much to the pleasure of the excursion.

TESSERÆ.

Stained-glass and Gothic Architecture.

IT may be admitted that Gothic picture glass-paintings, as well as pattern glass-paintings, harmonise with the contemporary sculpture in the form of their foliated ornaments, and many other details of strictly conventional character, and that they harmonise with the sombreness of the architecture and gloom of the building in which they are placed, in the cold tone, simplicity and intensity of their colouring or hue. Thus we find that all Gothic glass-paintings earlier than the last quarter of the fifteenth century are more or less cold in tone, the coldest, in general, being the earliest, when Gothic architecture was the most sombre in effect, and that we never meet with anything approaching warmth of tone until sombreness in Gothic architecture had nearly disappeared. We also observe that the earliest of the glass-paintings, whether white patterns or richly-coloured picture glass-paintings, are invariably deeper in hue or colour than the later examples, which are contemporary with a lighter style of Gothic architecture; and, moreover, that the principle of colouring displayed in the earlier examples is more simple, and therefore more solemn and grave, than that followed in the later ones. For instance, a light tinted effect, such as a late fifteenth or sixteenth-century landscape background has, is never seen in an Early English or Decorated picture glass-painting. Accident rather than design seems to have caused these progressive changes in the character and aspect of glass paintings, but it is unnecessary for the present purpose to seek to account for them. On the other hand, Gothic picture glass-paintings cannot be considered to harmonise with Gothic architecture or sculpture, either in their want of perspective and relief, or in their rendering of the human figure. If there is an excellence which Gothic architecture and sculpture possess in an eminent degree it is the relief produced by light and shade. Every sculptured ornament is so well relieved, that when seen under even the diffused light common to a northern climate, it appears prominent and distinct. Confusion of parts is a fault rarely met with in the most elaborate sculpture. Each ornament, in general, tells its own story when seen from the point of view which the spectator would naturally select. Mere surface decoration, to which Gothic glass-paintings bear a close analogy (such, for instance, as that which covers the spandrels of the choir arches of Westminster Abbey), is with exquisite judgment kept

comparatively flat, in order that the eye may not be distracted from the contemplation of other objects, which by their greater relief, as well as by their superior size, are rendered more important. But when we turn to a Gothic picture glass-painting, we meet with a display of diametrically opposite qualities—instead of relief we find flatness, and consequently confusion instead of distinctness. Indeed the contrast is so striking that we are tempted to inquire whether the artist really intended to produce anything beyond an harmonious arrangement of brilliant tints. It has often been asserted that, because Gothic glass-paintings are in unison with the illuminated MSS., and, like them, display many beauties of execution, such as feeling and high and delicate finish, that we are therefore to regard as intentional any defect in drawing, perspective or relief, since it is not to be supposed that artists possessing the skill which the Mediæval artists display in other respects could have been ignorant of these elements of art. But it has been answered with great force, that if perspective and the principles of correct drawing were found in some branches of Mediæval art, there would be some reason for supposing that they were excluded from others deliberately, and with a knowledge of their existence; but if they are universally absent, the inference is that they were universally unknown, and that, as nothing is more certain than that considerable acquaintance with some branches of artistic knowledge is compatible with ignorance in others, the argument drawn from the skill and finish displayed in many Mediæval works really amounts to nothing.

Norman Castles.

In the construction of a castle no ordinary skill was required. The subsistence and comfort of those who were enclosed within it were not less to be provided for by the architect than mere defence, or the devices by which the assailants might be misled or defeated. Most of the keeps had four distinct storeys, and the walls were not unfrequently from 12 to 20 feet thick at the base. In the souterrain of vaulted stone the military engines and stores were deposited. In the thickness of the walls were placed winding staircases, the well for water, the vast oven, enclosed galleries and chimneys, with an aperture open to the sky, and communicating with the dungeon in which prisoners were confined, and to whom it gave all the light and air they could receive. There was likewise a kind of flue for conveying sound to every part, not more than 8 inches in diameter. The state apartment occupied the whole third storey, and the staircases leading to it were made much more commodiously than the others, some of which were even large enough to admit military engines. Adjoining to the great chamber was an oratory. In Rochester Castle the chief room was 32 feet high, including the whole space within the walls. Suits of arras were suspended from the circular arch which supported the roof to make separate apartments, and attached against the walls as furniture. In the ground floor there was no light; loopholes only were allowed in the second; but in the third were three large round-arched windows, placed high, so as not to be looked through, and so defended by an internal arcade that no missile weapon could enter or fall with effect. Each floor had its communication with the well. The chimneys were very capacious and projected considerably into the rooms, resting upon small pillars, and the sinks were so contrived in an oblique direction that no weapon could be sent up them. Gundulph is said to have introduced the architectural ornaments of the Norman style into castles, both within and without. A large sculptured portal and windows, similar to those used in ecclesiastical buildings, appear in most of them. Castle-Rising, Norfolk, and Norwich abound in admirable specimens of Norman arcades and mouldings. In the circular or oval keeps, which usually occupied the whole area of the mount on which they stood, a richly-carved doorcase is to be discovered. They are still remaining at Arundel and Berkeley. The great tower of entrance was built at the foot of the artificial mount, from which was a sally-port with stone stairs leading to the keep. It contained the portcullis and drawbridge affixed to the archway and several spacious chambers. In point both of the formation of the mount and keep and their connection with the entrance-tower, the remains of Tunbridge and the more perfect state of Arundel Castle exhibit a singular resemblance. The walls were protected by very substantial ribs or buttresses, and the round keeps had a central space left open to admit the light and air. At Arundel the corbel-stones which supported the beams of timber, and which converged to an open centre, where was a subterraneous room, are still easy to be marked out.

Inlaid Work in Marble and Pietra Dura.

In ancient buildings marble was extensively used, and as, even in Italy, the finer kinds are rare, and consequently expensive, it was usual to cut the fine blocks into thin plates or veneers, and coat the inferior kinds with them. The halls of the public buildings and palaces were also floored with different kinds of marble cut into dice, or lozenge-shaped pieces, and arranged in geometrical patterns, to which the name

tesserae was applied by the Romans. This kind of work constituted originally the *opus musivum*, or mosaic, of the ancients; but gradually, instead of merely incrusting the walls with marble of one colour, or making simple geometrical figures of two or more differently coloured marbles, figures of trees, birds and other animals were cut out of them, and inlaid in a slab of some other variety of marble. This kind of mosaic was brought to great perfection by the Italians during the fourteenth, fifteenth and sixteenth centuries, especially at Florence. The Florentines, however, only used marble as the matrix, the substance inlaid being jasper, cornelian, different varieties of agates, chalcedony, amethyst, the half-opal, noble serpentine and other pseudo gems, and even Labrador felspar (which, as is well known, has a *chatoyant* lustre), lapis-lazuli, malachite (native carbonate of copper), &c. To produce work of this kind a well-polished slab of marble of the required form and size, and from an eighth to three-sixteenths of an inch thick, was prepared. Upon this the pattern was drawn and then cut out; the stones to be inlaid were then cut by the lapidary's wheel, as in ordinary gem setting, to the size of the pattern, and cemented into their places fully polished; for, if finished off when inlaid, great inequalities would be produced by the unequal wearing of the different stones, in consequence of having different degrees of hardness, especially where malachite and lapis-lazuli are employed. The slab thus made was veneered upon another and thicker slab of marble or wood, according to the object intended to be made. Instead of inlaying marble, ivory is sometimes inlaid in this way. The kind of work just described is known as *pietra dura*, or true Florentine mosaic, imitations of which are now commonly made in different parts of Europe; but instead of pseudo gems, different coloured marbles, glass, malachite, &c., are employed. Besides a number of objects inlaid with regular patterns, a great many tables are inlaid with *tesserae*, arranged in geometrical figures, or as chessboards. Sometimes table tops are made of a number of pieces of determinate figure, but all more or less different, and sometimes of unequal size. These are known as scrap tables, and are about the most tasteless and absurd productions upon which money and time can be squandered. Another class of this latter species consists of cementing a number of irregularly formed pieces of marble together and then polishing the compound, which is veneered upon a slab of slate or marble. This species of work is not, properly speaking, mosaic, but rather a sort of artificial pudding stone or brecciated marble; it is difficult to say which is the most tasteless. There is a further kind of mosaic of a most remarkable character, made of glass, and known as Roman mosaic.

The Apollo Belvedere.

The statue of Luni marble in the Vatican, known as the Apollo Belvedere, was found towards the close of the fifteenth century, among the ruins of Antium, on the sea-coast. Julius II., whilst a cardinal, purchased it, and retained it in his Palazzo Colonna, near the church of SS. Apostoli. It was afterwards transferred by this pontiff to the Belvedere of the Vatican; hence the name. This statue was engraved by one of the Marc Antonio school, in the time of the great Raphael. The mutilations of the figure are shown in the print. M. Visconti produced a certificate attested by many professional judges that the marble is not Luni or Carrara; when the statue was in Paris, the most experienced mineralogists pronounced it to be unlike any Greek marble they were acquainted with. No statue has commanded such universal admiration among artists, and notwithstanding the discussions raised with regard to its originality, all seem to recognise and acknowledge the excellence of the first conception. The fiery animation of the countenance, and the snaky treatment of the hair, point very strongly to the age of Lysippus, and favour the supposition that it is an excellent copy executed in the Augustan age. German critics go so far as to perceive in the countenance evident traces of the features of Nero. The remarkable breadth of nose seems the only circumstance in their favour. Whenever Nero appears in the character of any of the deities, his peculiar fashion of wearing the hair is always the same. The original statue is admirably placed in the Vatican in front of a niche of grey marble, and in a separate building from the rest of the sculptures. The son of Latona has just discharged the fatal arrow against the serpent Python. The bow still remains in his firm left hand, and the god appears to be watching the effect of his vengeance. Indignation is expressed in his countenance, especially by the dilated nostril and the curled lip. The eye seems starting, and the hair, light and flowing, contributes powerfully to the expression. It is bound by a band or strophium, and gathered in a knot over the forehead, as seen in many statues of Apollo and Diana. A quiver hangs at his right shoulder, and his feet are adorned with rich sandals. His mantle or chlamys is fastened on his right shoulder. It falls chiefly on his left side, and is thrown over that arm so as to display both his form and action with the utmost grace. A feeling of perpetual youth pervades the whole figure, and at the first glance vigour, agility and elegance, com-

bined with a noble expression of indignation, impress the beholder. The trunk of the tree seems allusive to the ancient olive of Delos, and the serpent twining round it is the emblem of health and medicine, of which he was the presiding genius. It may, therefore, have been the statue described by Pausanias, dedicated to the god in his medical capacity after the plague at Athens. It is most probably a copy from a bronze; the treatment and elaborate execution of the hair could not have been devised for a marble statue; the drapery hanging from the left arm confirms this opinion. It represents a single piece of stuff forming loose folds, which should correspond on both sides; but this is not the case. The sculptor did not venture, on account of the thinness of the marble, to follow the original in this respect, although in the bronze itself nothing can have been easier. It is most likely a first-rate copy executed in the Augustan age. Flaxman remarks:—"The energetic Apollo Alexicacos, or the Driver away of Evil (commonly called Belvedere), is 'severe in youthful beauty'; he supplies Homer's description to the sight—his golden locks are agitated, his countenance is indignant—the quiver is hanging on his shoulder, and he steps forward in the discharge of his arrow." Again, in comparison, he says:—"The boundaries of personal beauty are the Apollo and Hercules; a more slender form than the Apollo is *maigre*, and one more covered with flesh than the Hercules must be clumsy; as one in which the parts are more forcibly marked than in the Laocoon would be a dissected figure." The entire right forearm and left hand were restored by Montorsolo, a pupil of Michel Angelo.

Paolo Uccello.

The laws of perspective, the discovery of which was the most important scientific discovery relating to composition ever made, were first brought into application by Paolo Mazzochi, surnamed Uccello from his skill in painting birds. He was born at Florence in 1349, and was much assisted in his studies in perspective, to which he devoted himself with great ardour, by Giovanni Manetti, a celebrated mathematician of the time. In turning over the engravings from the Campo Santo we immediately perceive the vast superiority in the compositions of Gozzoli over those of the earlier painters, the result almost entirely of his knowledge of perspective. Gozzoli was half a century later than Uccello, and was instructed in this new art by his master Angelico. Among the other defects arising from unacquaintance with perspective, we may observe that the painters before Angelico gave to the glories round the heads of their saints the form of a round dish at the back of the head, or, if the face was in profile, attached to the cheek farthest from the spectator. In the pictures of Angelico we see these halos, for the first time, beautifully put in perspective, as we see them, when they were afterwards reduced to faint rings, in the cartoons of Raphael. The compositions of Gozzoli in the Campo Santo are very numerous and full of material, displaying great observation of nature and much taste. It is impossible not to admire the richness and splendour of his architectural backgrounds, though they are sometimes over profuse in ornament; but the extensive picture which concludes the history of Joseph can scarcely be praised enough. The architecture shares our admiration perhaps too equally with the groups, but it is so very beautiful that we are forced to forgive this. No story was ever more naturally told, nor grouping more unaffectedly simple. As was the practice in early art, several points of time are united in one composition, and Joseph appears in three different places; but what is most remarkable is that Gozzoli has adopted three different vanishing points in the perspective. The entire composition is, however, so harmonious that this violation of rule does not strike the spectator at the first glance, and if it be excusable, the apology is to be found in the fact that if but one vanishing point, and which must have been the central one only, had been used, the openings which show the sky and trees and a distant dome must have been shut out, and much that is beautiful consequently lost. Not that these excuses should constitute a precedent, for it is always in the power of the painter to adopt an arrangement that needs them not. But the example of Masaccio in the treatment of architecture with reference to figures is perhaps a better one, and in this he is sometimes to be preferred even to Raphael, for in the engravings I have seen from his works at Florence his backgrounds are always in strict subordination to the figures. All these painters, and indeed all before Leonardo da Vinci, gave the costume of the ages in which they lived to whatever subjects they painted, hence their pictures have an antiquarian interest to us not thought of by themselves.

The Commission charged with the organisation of the dramatic and musical performances in the old Roman Theatre of Orange includes among its members MM. Formigé and Garnier, architects, Injalbert, sculptor, and Benjamin Constant, painter.

NOTES AND COMMENTS.

It is politic to decry the State and municipal architectural departments in America, for without them an enormous amount of practice would be obtainable by architects. According to a New York paper one architect was fortunate enough to receive 22,283 dols. commission on fire brigade houses, stables and police stations. The total sums paid in commissions for fire and police stations was 240,000 dols. Economists—and in the United States they usually mean gentlemen whose friends are not in office—contrast the outlay with that of the Architectural Department of the Education Board, which altogether amounted to 9,500 dols. The chief architect, who designed and superintended the construction of a high school and thirteen other buildings, received out of that sum 2,600 dols. It is most unjust that an able architect should be so meanly rewarded, and for the sake of justice the crusade against architectural departments is justifiable.

THE marble industry in the Massa-Carrara district, it appears, has suffered to a great extent by the political troubles that took place in the Lunigiana in February, 1894. For nearly a month all work was practically at a standstill. The country was placed under martial law. When order was re-established, an inquiry into the grievances of the quarrymen led to the adoption of several remedial measures, including a general system of insurance of the working-men, a recognition of the employer's liability in cases of accident, and a general supervision of the quarries by skilled engineers, employed by the municipality, with the special object of preventing undue risk and loss of life. There was also over-production, and a continuous decline in prices caused by competition. This was especially felt in sawn and worked marble. In the latter, however, there seems to be a brighter outlook, and several large orders for architecture and sculpture have been received. Owing to high protective duties abroad, the depression in sawn marble continues, and many of the saw-mills have been closed. The prices for block marble are still as low as in 1893, but slab marble has seen further reduction. Statuary marble of the first quality has been scarce, and prices were consequently maintained. Few works of note have been executed during 1894. In the mountains above Castelpoggio, not far from Sarzana, there are several quarries of a very beautiful red and violet marble with white veins. It is, however, unsound and difficult to work. The British marble firms at Carrara are:—Messrs. WALTON & NEPHEW; B. FABRICOTTI; ANSELM, ODLING & SONS, Limited; C. DENHAM; J. ROBSON & SONS. At Massa:—The Massa-Carrara Marble Company; ARTHUR SENNETT.

THE doubts which have been excited by the frailty of buildings in New York could not escape the attention of insurance speculators. Collapse may be more profitable to them than fire, for, taking the average of even an American city, there are likely to be fewer losses. The *American Architect*, in writing on the subject, says:—"What may become a very important movement has been started in New York. It is well known that several buildings in and about that city have recently fallen down. The owners have been unable to collect indemnity from the insurance companies for their loss, for the simple reason that all New York fire insurance policies provide that the contract of insurance shall not apply to cases where the building, or any part of it, falls before taking fire; and some of them have been influential enough to procure the appointment of a committee of the Board of Trade, to confer with a similar committee of the fire underwriters on the matter. The conference resulted in showing that, under the State laws, fire insurance companies cannot insure against the fall of buildings, or pay losses caused by the fire after such a fall; and it seems probable that the demand for such insurance may cause the formation of new companies, organised expressly to furnish it. There is no doubt that the business would, at first, be profitable, for the contingency of the fall of a structure is an extremely remote one, and a small fraction of the rates charged for fire insurance would be amply sufficient to cover it. If, however, the practice of insuring in this way should become general, the

rates would fall, and the companies engaged in the business would naturally try to exert their united influence to improve the stability of ordinary construction. Such influence might hereafter become a powerful factor in the practice of building. Although the influence of the fire insurance companies on the art of construction has not been in all respects favourable, no one can deny that it has been very great, and a similar, or rather supplementary, influence exerted in favour of stable and rigid building ought to be useful. We presume that the day has gone by when an insurance company of the sort would favour bad construction, on the ground that an occasional collapse of a building was 'good for the business,' and that stability insurance would be managed as rationally as fire insurance now generally is. With that proviso the new movement is certainly to be encouraged."

MODELS are able to point to their counterfeit presentments in many guises. They are in such cases holding an official capacity. But as individuals they are not recognised by artists. Who can recall a portrait of a model in all the exhibitions of the Royal Academy, unless in a case where one of them marries well and poses as an amateur? Old Mother KRÜGERMANN, who as an antique goes before all of her class in Berlin, has had the distinction of having her portrait painted by Professor MENZEL, and it is to be seen in the Berlin Exhibition. She does not appear in character, but as she can be seen often in the streets, any one who wishes to see her in fancy dress has plenty of opportunities in the National and other public galleries. She is the ATROPOS in THUMANN'S *Parce*, and is about to cut the thin-spun thread; the Countess VOSS in HILDEBRAND'S *Flight of Queen Luise*; the serving-woman in KRAUS'S *Children's Party*. In both ancient and modern subjects she has taken her part on canvas. The old lady has passed her eighty-eighth birthday—for the portrait was painted as a memorial of the anniversary—but she is still hale and hearty, and ready to endure the painful toil of a model, which practice rarely lessens.

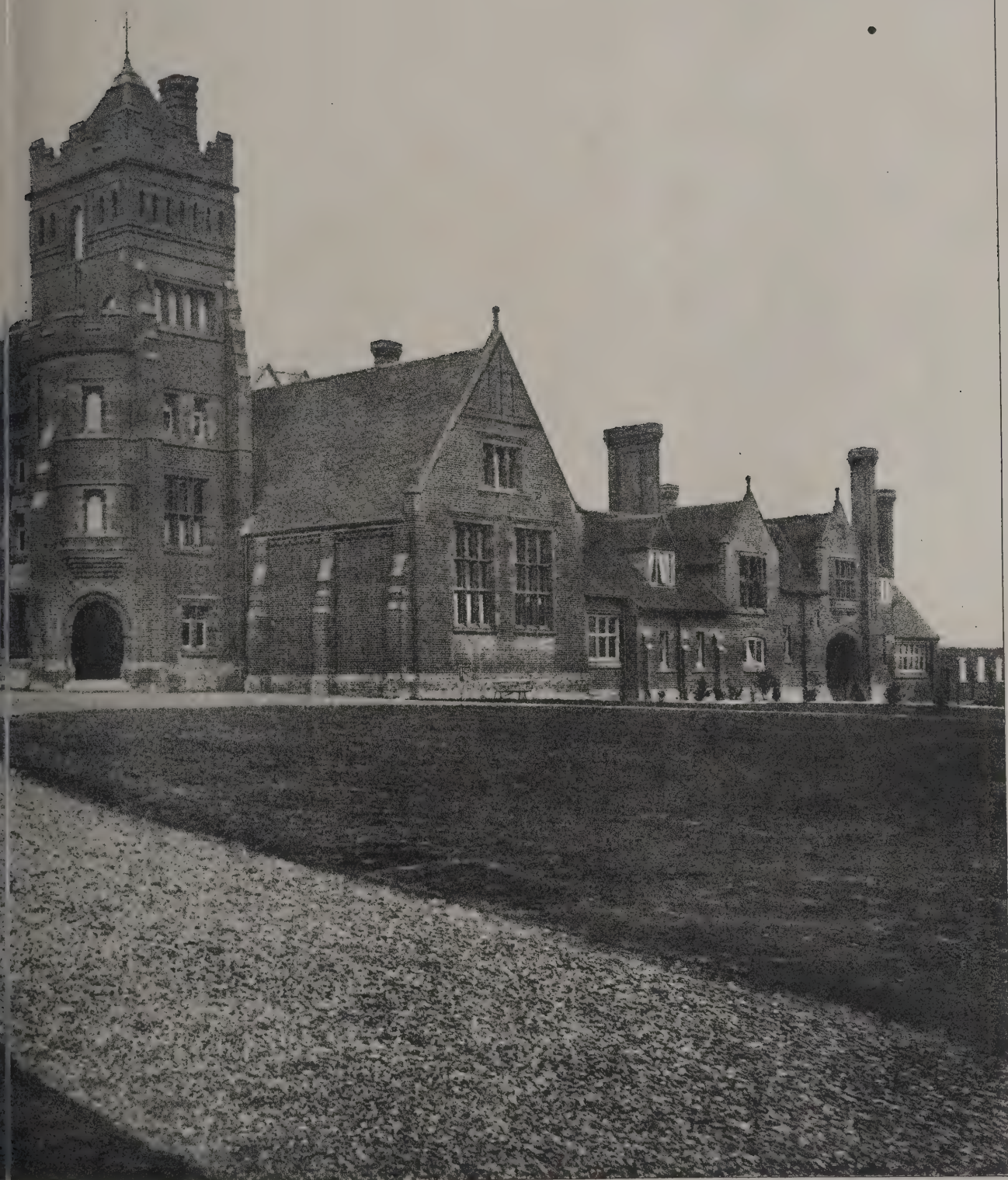
A MEETING of the Lancashire and Cheshire Associations of Baptist Churches was held on Wednesday, when a report on chapel building was considered. A committee had reported that it was altogether undesirable to set the pastor of a church the task of begging for his own chapel amongst the Association churches. It was recommended that there should be one fund raised by the associated churches, and known as the Association Fund; and that, from such fund, the needful expenditure both for home mission churches and the new chapel-building cases should be met. In order to raise this fund each church should be asked to contribute, at any rate, not less than the proportion of 7½ per cent. per year per hundred members. The Council suggested the appointment in every church of an Association representative, who should undertake the responsibility of superintending the collection of the moneys in his own church. The Council recommended that such fund should be devoted at the rate of not more than one-third to chapel-building cases, that subscribers should have the option of giving to either or both of the objects. To bring the scheme before all the churches and get it into working order, it was recommended that a dozen active members of the Association should be asked to undertake the organisation of the churches in the various districts. It was further recommended that not more than one chapel case in a year be adopted. The recommendation was adopted.

A DECISION has been given by the United States Attorney-General, which it is to be hoped may not be accepted in this country. Tenders were lately invited for the erection of buildings in the Navy Yard of New York. The lowest tender was accepted, but the builders declined to enter into the contract on the ground that an error arose in copying the estimates, and which was not detected in time. The Attorney-General was consulted, and he gave the opinion that a tender could only be withdrawn when an error was mutual, and that negligence on one side was not a sufficient ground. It is often inconvenient for a tenderer to withdraw, but the practice is generally tolerated in this country.



PHOTOGRAPHED BY BEDFORD, LEMERE & CO

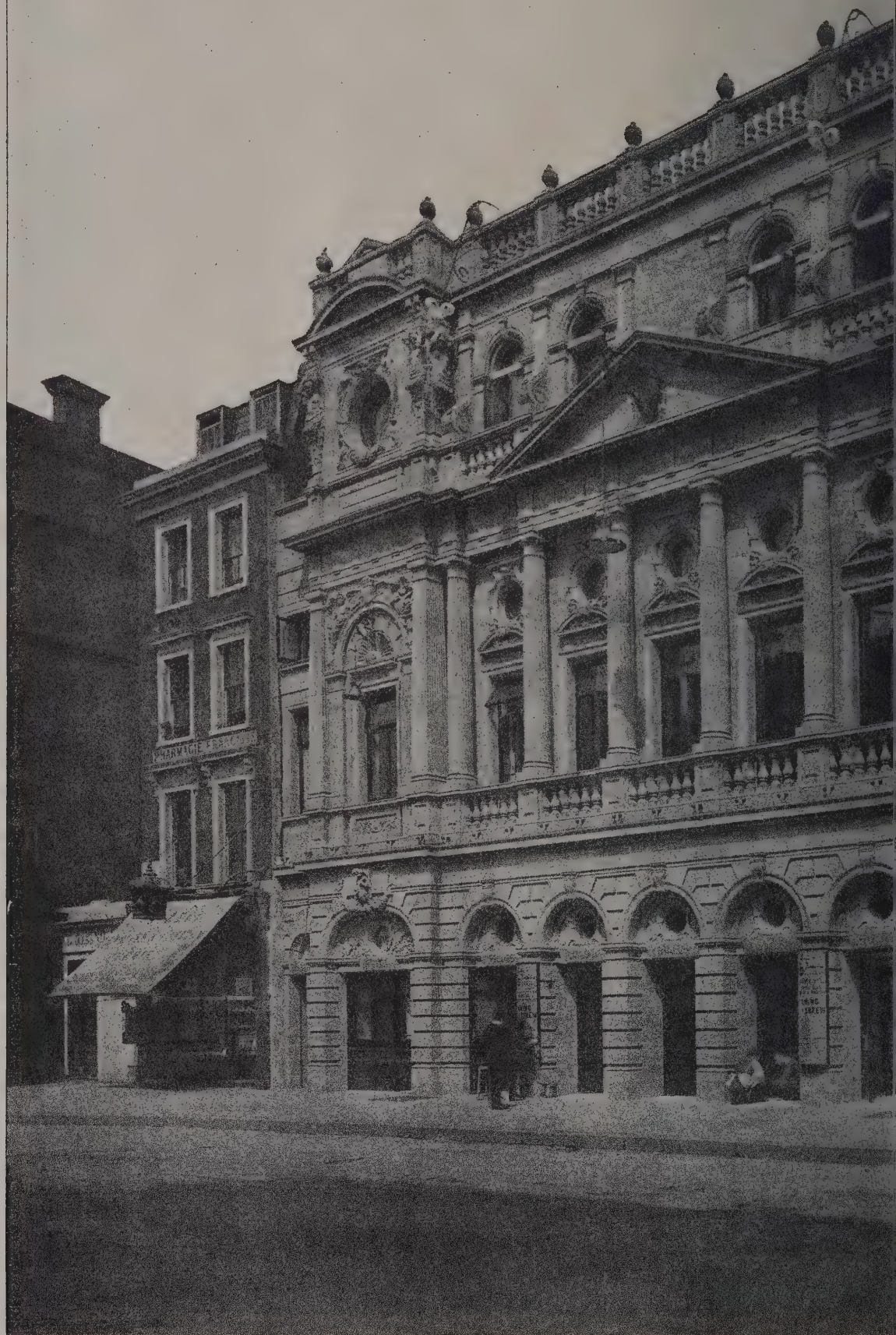
1895.



INX PHOTO SPRAGUE & CO. 45 (100) HARTING STREET, BOSTON, MASS.

FRON WALDEN.

itect.



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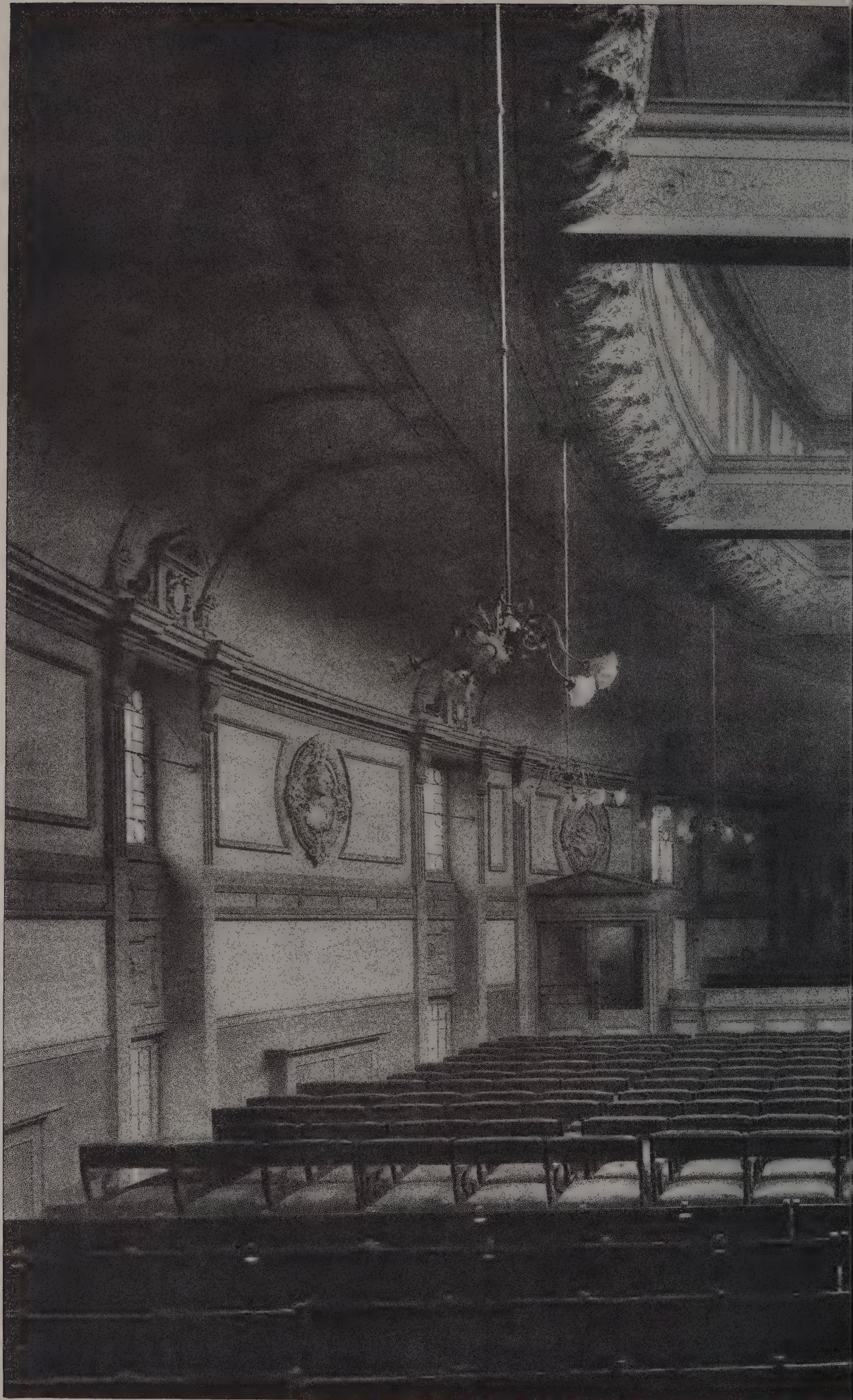
DALY'S THEATRE, (The Late SPENC

21st 1895.



PHOTO SPRACUE & CO. 4 & 5 EAST HARDING STREET FETTER LANE

DURNE STREET, W.
WICK, Architect.



PHOTOGRAPHED BY BEDFORD, LEMERE & CO

June 21st 1895.



INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

HALL, LANGHAM PLACE.
EY, Architect.

ILLUSTRATIONS.

FRIENDS' COLLEGE, SAFFRON WALDEN.

DALY'S THEATRE, CRANBOURNE STREET, W.

SMALL HALL, QUEEN'S HALL, LANGHAM PLACE.

"THE BARBER SURGEONS," HOLBEIN.

MANY of our readers must have seen an engraving of a picture representing some barber surgeons on their knees before Henry VIII., and looking as uncomfortable as if they were the Calais hostages before Edward III. The picture should be transferred to one of the attics of the College of Surgeons. But with the cupidity which characterises the dealings of most of the City Companies, it is proposed to sell the picture, or, as it is expressed in the customary slang, the Barbers "would consent to receive 15,000*l.* for it." Some City gentlemen have accordingly issued the subjoined circular. As a picture it is vastly inferior to the *Ambassadors* in the National Gallery, and to be made out it will have to undergo a course of operations. Whether City Companies can sell inheritances is doubtful, but in this case the picture could be sent out of the country without any loss to a single surgeon or barber, unless they are of the nominal sort. Too much rubbish is already to be found in English galleries. The following is the circular:—

A public movement is on foot to secure from the Worshipful Company of Barbers the famous historical painting by Hans Holbein, representing the ceremony of the incorporation of the Guild of Barbers with the Guild of Surgeons by Henry VIII. in 1540, in order that the picture may be placed in the Permanent Art Gallery of the City of London at Guildhall.

For various reasons the Barbers' Company have been led to entertain the question of the picture leaving their hall, chief among these being—(a) The close proximity of the hall to the large Wood Street warehouses which crowd around it, and the consequent and constant danger of fire, from which so large and heavy an oak-panel picture could only be rescued with great difficulty, if at all. (b) the inability to properly see the picture (in its present ill-lighted situation) as well as it could be seen in an adequately-lighted gallery; (c) the opportunity which would thus be afforded to the company by an increase of its funds of extending its sphere of usefulness in the direction of charity and education.

In the event of this picture being placed in the open market, it would certainly realise a large sum, with the probable result of its leaving this country and passing either to some continental gallery or to America.

It is one of the earliest known paintings connected with the City of London, and represents an interesting historical incident in connection with two of its most ancient guilds. As such, it should not, in the opinion of many, be permitted to leave the precincts of the City.

A strenuous effort is, therefore, being organised to obtain the funds necessary to place a work of art so closely identified with the City of London in the Permanent Art Gallery at the Guildhall, which is daily open free to the public.

The picture is the largest that Holbein painted, being 6 feet high by 10 feet 3 inches wide, and contains eighteen life-size figures in addition to that of King Henry VIII.

On condition that the picture is secured to the Guildhall Gallery, the Barbers' Company would consent to receive 15,000*l.* for it, which sum would be handed intact to the company and be subject to no commission in any quarter.

We venture to express the hope that so desirable a project as that now submitted will be favourably considered, and receive your kind support.

STUART KNILL, Adelaide Buildings, London Bridge.

JOSEPH C. DIMSDALE, 50 Cornhill.

ALBERT G. SANDEMAN, Bank of England.

P.S.—Sir Joseph Dimsdale is acting as honorary treasurer to the fund, and it is requested that your reply to this communication may be addressed to him at 50 Cornhill.

DISCOVERIES AT SILCHESTER.

WE have already mentioned the discovery of a large mosaic at Silchester. According to the *Times*, the systematic excavation of a hitherto unexplored insula or square lying midway between the basilica and west gate was continued in May. This insula has been found to be almost entirely covered with the foundations of two very large houses, each of which had a courtyard facing north and entered from the main street on that side by a gateway of considerable importance. The easternmost house has a street frontage of more than 200 feet and extends backwards for over 150 feet.

Its principal chambers were on the west side and had mosaic floors, unhappily almost entirely destroyed. A vestibule in the north part of the house, about 12 feet wide and 50 feet long, has fortunately nearly the whole of a very remarkable mosaic pavement. It consists of a groundwork of common red and drab mosaic, arranged in long bands or panels, filled with squares or lozenges and coupled by frets. In this are set, in somewhat capricious fashion, no fewer than five, if not six, panels of fine mosaic work of excellent design. First, there are two small squares, each 2 feet across, placed side by side with an interval of a few inches. Then comes a large panel 6 feet square, with a bust (unfortunately much injured) within a circular border. Beyond this is a long and narrow panel of interlacing work, and beyond this again the remains of a fine panel (or perhaps two placed end to end) over 20 feet long, which has evidently been almost entirely destroyed within the last few years through the agency of a "scarifier." Very few instances of so elaborate a combination of coarse and fine mosaic patterns have come to light in Britain. The occurrence, therefore, of so curious and perfect an example at Silchester is noteworthy. At the west end of the vestibule is a small room on a lower level, with a very perfect floor of drab mosaic with a central panel of fine work, but this is injured in the centre. Against its east wall are the remains of a fireplace, a most uncommon feature in Romano-British houses. The other house is quite as extensive as the first. Its plan resembles that of most of the large houses found at Silchester, and of the principal Roman villas in this country, a series of chambers lined by corridors and arranged round three sides of a courtyard. Only the principal wing, that on the east, has as yet been completely uncovered, but in this, besides two rooms warmed by hypocausts, are no fewer than five other rooms, all of considerable size and with mosaic floors. The northernmost room has in the centre a large panel of fine mosaic, about 15 feet square, composed of five large circles within octagons, and filled with stars and geometrical figures, the whole being enclosed by a broad border of braidwork and set in a ground of red tesserae. The colours used are black, white, red and yellow. About three-fourths of this pavement is intact. The next room has an almost perfect mosaic pavement composed entirely of fine black and white tesserae arranged in eighty-one squares or panels of geometrical design coupled by fretwork. It measures about 14 feet by 16 feet, and is set in a ground of coarse red tesserae. The next room had a fine mosaic pavement of about the same size as that just described, composed of sixteen octagonal panels of black, white, red and yellow tesserae, but unfortunately almost the whole is destroyed. A passage paved with ordinary red tesserae separates the three northernmost chambers from the other two. One of these has a plain red pavement only. The southernmost chamber retains a nearly perfect mosaic centre, about 14 feet square, formed of nine hexagonal panels with floral and other devices, all of good design and character. Whether any other fine mosaics will be found in the other parts of the house remains to be seen, as at present only the lines of the walls have been traced. It is hoped that it will be found practicable to remove the better-preserved pavements to the Reading Museum, where the Silchester Loan Collection has been deposited by the Duke of Wellington.

ROYAL ARCHITECTURAL MUSEUM.

THE annual general meeting of this museum and the Westminster School of Art was held at the museum, Tufton Street, Dean's Yard, Westminster, on Friday. The Duke of Westminster occupied the chair, and among those present were Sir Arthur Blomfield, A.R.A., Sir W. E. de Souza, Mr. Aston Webb, Mr. C. F. Hayward, Mr. W. Pain, Mr. J. P. Seddon, Mr. W. C. Cocks and Mr. F. Ford (the secretary). The museum, which has occupied its present position for twenty-five years, formerly existed at Cannon Row, and is the only architectural museum of the kind in the Metropolis. The Council, in their report, expressed regret at the decease during the year of three of the vice-presidents of the institution—Viscount Harding, Sir E. A. H. Lechmere and Sir A. H. Layard—and also at the resignation of the Bishop of Ely from the position of president. Great satisfaction was expressed at the improved financial status of the institution, which was due to the popularity of the School of Art and to the grants received from the Technical Education Board of the London County Council. Sir A. Blomfield, in moving that the Duke of Westminster be elected the president of the institution, said he was glad to report that it was in a more flourishing condition than it had ever been before; but that, he said, was due rather to the success of the School of Art than to the support it had received from the members of the architectural profession, who, unhappily, had taken but little interest in the unique collection and casts which the museum possessed. The Duke of Westminster said he felt greatly honoured at being elected the president of so valuable and remarkable a museum and school of art.

EARLY MAPS OF LONDON.

THE paucity of topographical delineations of the ancient city of London is remarkable. The earliest extant is that of Anthony Van den Wyngrede, executed in 1543, the original of which is still preserved in the Bodleian Library. Little, however, is known of its author; by some authorities he is said to have been in the pay of Philip of Spain. This view is more valuable for its architectural details than for its topographical accuracy. It extends from Greenwich to Westminster. A reduced copy of it by N. Whittock is but a poor representation of the original, and, being a made-up plan, is of little value. The next view in point of date is that published by Braun and Hogenberg, in their work entitled "*Civitates Orbis Terrarum*," in 1572-73. George Braun wrote the geographical and topographical description, whilst Francis Hogenberg, with the aid of Simon Novelani and George Hoefnagel, engraved the maps. This is on a very small scale; it shows the cities of London and Westminster, from the slaughter-house at Millbank to the beer-house beyond St. Catherine's Hospital. On the southern bank of the Thames, the Roman manor of Paris Gardens and the position of the bull-ring and bear-pit are very clearly marked. It has the arms of Elizabeth in the left-hand tablet, and that of the City on the right. The State barge on the river proceeding to Westminster has the arms of the Queen upon the canopy, and the figures in the foreground are in the costume of that period. This, although small, exhibits much artistic skill, but for the following reasons cannot be classed among original surveys. It shows the old steeple of St. Paul's, which was destroyed by lightning in 1561, and never rebuilt. It cannot be supposed that for the purposes of Braun's work the whole of the cities of the world which are engraved therein were actually surveyed; indeed, the vastness of the labour and cost of such an undertaking would seem to render such a supposition incredible. It must have been compiled from some older surveys then existing. There is an entry of the publication of a "*Carde of London*," about the date 1562-63, to which Braun might have been indebted for his survey.

John Norden, in 1593, published in his "*Speculum Britanniae*" a view of London and one of Westminster. That of London extends from the Temple to St. Catherine's by the Tower; it measures 9 inches in length by 6 inches in breadth, and was engraved by Pieter Van den Keere. The arms of Elizabeth are shown in the tablet at the left-hand, and the City's in the right; around the margin are the arms of the twelve principal companies. As a specimen of the engraver's skill it is of considerable value, but it is too small to convey anything like an accurate topographical delineation of London at this period. The view of Westminster is from the Temple to Millbank; it is 9½ inches in length by 6 inches in breadth, and although small, is valuable in some respects, particularly as to the several buildings at Whitehall, the parks, water-courses, &c.

The next view of London in point of date is by Cornelius J. Vyscher, and is entitled "*Londinum florentissima Britanniae urbs toto orbe celeberrimum emporium*." It was published at Amsterdam in 1616. The view extends from the Palace of Whitehall westward to St. Catherine's Hospital eastward. It is a very fine specimen of the engraver's art. The theatres and bear-garden upon the banks are worthy of particular observation, and so are the timber houses leading to and on the bridge, viz. Nonsuch House and Southwark Gate Tower. The architectural details of many of the buildings too are most interesting, especially the water tower at Queenhithe, the Steel Yard, Coleharbour, Old St. Paul's, Baynard's Castle, Old Fishmongers' Hall, Winchester House, the tower of Bow Church, &c. A copy of this view in fine condition is preserved in the King's Library at the British Museum: along the top is the title, and at the bottom a long Latin inscription. It is printed on four sheets and measures 7 feet 1 inch in length and 1 foot 6½ inches in breadth; at the top are two figures, the one to the left has the arms of James on the flag; that to the right has the City of London. There is another copy of this edition in the Guildhall Library, wanting the title and the Latin inscription. The artist, although a pupil of the celebrated Peter Soutman, adopted a style of his own, which he carried to great perfection. Another copy which exists was evidently done some years subsequently, extending eastwards to Greenwich, but inferior both in execution and detail, although it bears Vyscher's name: from internal evidence it would seem to have been the work of some Dutch or German artist. The Palace at Whitehall is called "*Konig's Pallast*;" St. Dunstan's in the East, "*S. Dunston inde East*." In the print-room at the British Museum is a copy printed at Venice in 1629, but although this also has Vyscher's name, it is evidently only a bad imitation of his view.

The long view of London made and engraved by Wenceslaus Hollar, and published at Amsterdam in 1647, is a splendid specimen of the work of this master of copperplate engraving. The view extends from Whitehall to Greenwich, and measures in length 8 feet and in width 1 foot 6 inches. Hollar's view

has been the fruitful source from which several Dutch artists have taken their inspirations. Among these may be classed Johannes de Ram, Romboist Van den Hoeve and several others, and it is much to be regretted that they did not follow their copy, but in this they have signally failed. The towers of the churches and some of the public buildings have been made to assume most fantastic shapes. These views must be taken as apocryphal only.

The next in importance to Hollar is that of his pupil, Robert Pricke. It is entitled "*The South Prospect of the famous City of London*, being the Metropolitan of Great Britain," sketched and engraved by the author. The view is taken from St. Olave's Church, Southwark, and shows the tops of the buildings in the City; those, however, in Southwark leading to the bankside are very picturesque, and are good specimens of the timber houses of old London. The view extends from Baynard's Castle to Greenwich, and as a specimen of engraving it is only inferior to Hollar's large view, but it is a mere picture of London. This must not be confounded with a view of London after the Fire in 1667 by the same artist, the latter being a very poor production in comparison.

In 1658 Newcourt surveyed London. His survey was engraved by William Faithorne. This is valuable as showing the growth of London within a few years. It extends from Westminster to Limehouse. The architectural features are treated in a very stiff and conventional style, the growth of London both east and west being, however, a marked feature. The houses west of St. James's Park, Tart Hall and its surroundings, are curious. There is a small view which, from its general treatment, was probably done subsequently to this; it is entitled "*The Newest and Exactest Mapp of the most famous Citties, London and Westminster*, with their suburbs, &c., so that it is a ready help or guide to direct countrey men and strangers to find the nearest way from one place to another. By T. Porter. Printed and souled by Robert Walton, at the Globe and Compasses, on y^e north side of St. Paul's." It extends from Westminster to Limehouse, and north and south about as far as Newcourt's map. This was evidently engraved to fulfil to the letter the expressed purpose of its author, for all the streets, lanes, &c., are made much wider than they really were. The buildings and architecture are quite matters of secondary importance. It is 2 feet 6 inches in length by 11 inches in width; it has the arms of James I. on the left side, and those of the City, supported by two figures representing Justice and Prudence, on the right. It is most interesting in its details.

Hollar engraved a ground-plan of London previous to its destruction by fire, but on a very small scale, 11 inches in length by 7 inches in breadth; it was dedicated to Sir Robert Vyner, baronet and alderman, whose arms are engraved upon the margin, and who was Lord Mayor in 1653-54. Hollar subsequently designed a ground-plan of the City, to be finished in about four sheets. This was, however, never completed, although, from the following letter addressed by King Charles II. to the Lord Mayor, it would appear to have made considerable progress, but was standing still for want of funds. There is a letter from Charles I. to the Lord Mayor, in which the king recommends "*Wincellaus Hollar unto you and your Court of Aldermen*, that you and other well-disposed citizens by your example would become benefactors to him in such measure as may conveniently enable him to finish that exact delineation of our said city which he hath so ingeniously begun."

There is another view by the same artist taken after the Fire. It is entitled "*A Map or Ground-plot of the City of London and the Suburbs thereof*; that is to say, all which is within the jurisdiction of the Lord Mayor, showing the part destroyed by fire 1666; sould by John Overton at the White horse in little Brittain next doore to little S. Bartholomews Gate. 1666." This measures 13½ inches by 10½ inches, and extends from East Smithfield to Lincoln's Inn, the Temple, &c. This is far too small to be of any value, and no one can accept it as done from an actual survey; it is, in fact, a picture of the City in its desolation.

"An exact surveigh of the streets, lanes and churches comprehended within the ruines of the City of London, first described in six plats 10 December 1666, was prepared by order of the Corporation by John Leake, John Jennings, William Marr, William Leybourn, Thomas Streete, and Richard Shorlgrave, surveyors, and reduced into one entire plat by John Leake for the use of the commissioners for the regulation of streets, lanes, &c." This really gives an accurate delineation of the streets and lanes, &c., but nothing further.

Strange as it may seem, with the exception of the map attributed to Agas hereafter referred to, the foregoing are the only authentic views of London until after the Fire, and no ground-plan of any value anterior to that date has come down to our time.

Immediately after the Fire the two sworn surveyors, John Ogilby and William Morgan, who were officially engaged in

plotting out the disputed property in the City of London, surveyed the whole of the City and published their ground-plan in 1677. This work well deserves consideration; its accuracy has been so frequently tested that it is now referred to as an undoubted authority in cases of disputed lights, rights of way, &c. As a specimen of the engraver's art it stands without a rival. This may be accounted for by the engraving of the major part being the handiwork of Hollar. It is easy to trace where this great artist left off and where an inferior hand began.

Vertue, the engraver, stated that he had re-engraved in facsimile an ancient map of London in the possession of Sir Hans Sloane, to which he assigned the date of 1560, and further alleged that it was probably the work of Ralph Agas, who was a native of Stoke-by-Nayland, in the county of Suffolk. The date of his birth cannot now be exactly ascertained (the parish registers commencing only in 1558), but it may be conjectured that it probably occurred at some period between the years 1540 and 1545. Of his early life little is now to be discovered, but the following facts have been gleaned from the register of the parish as to his family. The first is dated "9th April, 1579; christened Thomas, son of Ralph Agas." The next is that of his son Benjamin, "31st March, 1588; christened Benjamin, son of Ralph Agas." Then follow his grandchildren, "1597, December 31; christened William, son of Robert Agas." "1599, September 23; christened Robert, the son of Robert Agas."

In the Lansdowne MSS. preserved at the British Museum are several original documents, written in a very neat hand by Agas himself. The first is a letter addressed by him to William Lord Burghley, lord high treasurer to Queen Elizabeth. It is dated 1592-93, and entitled "A Noate for the Perfection of Lande Measure, and exact plattinge of Cities, Castels, Honors, Lordshippes, Manors, and Landes of all sorts, by Rad Agas." It is a quaint description of the manner of surveying lands, &c. In it he speaks of the profitable staff and the theodolite, of some 20 inches in diameter, with a protractor of 1 foot at least.

The next document in point of date is addressed to the same nobleman; it is dated in pencil 1597. In this he speaks of his labours in the Fenlands, how he had plotted out the ground, gauged the quantity of the waters, the ebbs and flows and the daily abuses of the landholders; and, while thanking his lordship for the bounties already received, alludes to a considerable sum which was still owing to him for his services.

There is also a document in the form of an advertisement, printed on a half-sheet quarto, to be issued to his patrons; in this he describes himself as of Stoke next Nayland, in Suffolk, and asserts that he had practised in survey for more than forty years. He states that he has a perfect knowledge of customary tenures and titles of all kinds, that he was a good penman and well acquainted with old records, &c. In another MS. we find an opinion given by him to the commissioners appointed to inquire into the question of concealed lands belonging to the Crown; it is dated November 5, 1606.

On November 17 in this year we find him lodging in London, at the sign of the Helmet in Holborn, at the end of Fetter Lane; and if we desire to learn what manner of man he was, his qualities, abilities, pursuits, &c., he has left us ample means in a very quaint document, issued doubtless as an advertisement. From this it would appear that he entertained a very good opinion of himself; besides his knowledge of surveying he was able to read old records, and to restore any worn, "obliterated or dimmed," as well as to make calendars to them. He could find the weight and measure of any solid body. He was clever in arithmetic. He had a recipe for the preservation of the eye. He could remove and replant without injury trees of a ton weight, and had had forty years' experience in his profession. His decease is thus recorded in the parish registers of Stoke-by-Nayland already referred to:—"Burialls Anno Dñi 1621. November 27 was buried Ralfe Agas, an aged," that is, an aged man. The diary of Adam Winthrop, of Groton, Suffolk, appended to the "Life and Letters of John Winthrop, Governor of the Massachusetts Bay Company, at their emigration to New England in 1630, contains the following entry:—"1621, Nov. 26, Ralfe Aggas, the creple died." Supposing, therefore, that he had attained the age of eighty, his birth would have occurred in or about the year 1541.

The only copies of the works generally ascribed to him now extant are three, namely, one of the city of Oxford preserved in the Bodleian Library, and two of London, one of which is to be found in the Pepysian Collection at Magdalene College, Cambridge, and the other is the property of the Corporation of London. The only other survey of his of which particular mention is made is that of the town of Dunwich, in Suffolk, with its churches, adjacent villages, &c., on a large skin of vellum, with several remarks made by him in March 1589, which Vertue says he had seen. This plan, says Dodd in his "Connoisseur's Repertory," was formerly in the possession of Thomas Gardner, deputy-controller of the Customs, of Dunwich.

The dates to be assigned to the two published maps of Oxford and London have been the subject of much controversy among topographical authorities. The most important, indeed the mainspring of the whole, are the statements made by Vertue to the Society of Antiquaries. According to the minutes of March 21, 1736-37, "Mr. Vertue showed a plan and view of London and the river Thames, and parts adjacent, lately engraved by him, being the first large prospect made of the Famous Antient City. It was constantly reported to have been taken in Henry VIII.'s time, others said in that of Edward VI. But from several circumstances it appears to be early in Queen Elizabeth's reign. It was originally cut in several platts (*sic*), and published about anno 1560, the prints thereof being now of the greatest scarcity. Few copies are preserved, it being customary to hang them up against walls; therefore they decayed in length of time. Mr. Vertue gave the Society to understand that the plan then shown was reingraved, to oblige the curious and the antiquaries of this age, on eight plates of hard mettall, much in the same manner with that of wooden cutts, thereby to transmitt a just idea of the form and greatness of London as it was in Queen Elizabeth's reign."

The second minute is dated February 2, 1737-38, and runs thus:—"Mr. Vertue brought an account of the ancient print in the possession of Sir Hans Sloane, of the City of London, of which a copy has been taken and engraved by Mr. Vertue himself. It is intituled 'A Plan and View of London, with the River Thames and adjacent parts, being the most ancient Prospect thereof in Print.' This was reported to have been taken and done in Henry VIII.'s and King Edward VI.'s time. But from several circumstances it appears to be done early in the beginning of Queen Elizabeth's reign, about 1560, having been done in blocks of wood. The prints thereof are now of the greatest scarcity, being usually put up against walls in houses; therefore in length of time most of them decayed or lost. Above was CIVITAS LONDINVM. The original plan was probably the same which Radulphus Aggas tells us, in his plan of Oxford, that he had in his hand, and done after this was begun; but it must be observed that this very impression is a second publication, with the date 1618, and that there are several alterations from the first, in this particularly: instead of the arms as Queen Elizabeth bore them, those of King James I. and England, France and Scotland put in the place of them. And in the first has been explanations of the remarkable places in the City and suburbs, as may be observed in many parts by letters A, B, C, D, *a, b, c, d* of reference. The length of the printed plan, 6 feet 3 inches by 2 feet 4 inches, contained in six sheets and two half-sheets; but it seems the notes of explanation were at bottom printed on slips of paper to be added.

"Subjoined here are several remarks which show it was done in Queen Elizabeth's reign:—Westminster Palace water-gate, which belonged to the king, is there called the Queen's Bridge. At Charing Cross, Northumberland House, not built in the Strand, Arundell's Place. Paget Place, 1563, Sommerset Place. Lincoln's Inn Fields not divided. More-fields undivided. Royal Exchange—not built till 1570. Bulwar's water engine set up—1594-95. Nor is it in Norden, 1593. N.B.—To oblige the curious of this age, an. dom. 1737, it was re-engraved to hand further to posterity the ancient extent of this famous City of London from the old print of it in possession of Sir Hans Sloan, Bart., by G. V."

Gough, in his "British Topography," published in 1780, adopts the statements of Vertue, which he had evidently seen, but quotes the opinion of the antiquary Bagford that it was finished in 1588, and of Mr. Ward that it was not finished at that time. He gives the date to a copy of the map in the possession of Sir Hans Sloane, 1618: this is the first statement of a date, but he thought it was a republication with alterations. Thomas Dodd, in the "Connoisseur's Repertory," vol. i., says that Agas flourished in 1580, and that he surveyed London, but he affirms that his map was more in the nature of a bird's-eye view, and was prepared about 1578. He then goes on to charge Mr. Vertue with fabricating a copy of Agas's London, and complains of the faults committed in foisting this upon the public.

W. Y. Ottley refers to this Old Plan of London, and agrees with the date of 1560 for its preparation; he also confirms Dodd's account of Vertue's shortcomings. He quotes lines from Dodd's copy of the map to show that this edition was not published until James's reign.

The two copies referred to by Gough as being in the possession of Sir Hans Sloane and Dr. Mead, if they really were copies of the original map, are not now to be found. The copy said to be in the Lambeth library is Vertue's edition. The different editions contended for by Ottley have also disappeared. The only two copies of the original now known are the Pepysian and the Guildhall, and these are of the same date. Pepys's copy, preserved in his collection at Magdalene College, Cambridge, has written upon it in his own neat writing "A very ancient plan of London;" and in his index to the volume in

which it is bound he has written, "The most antient extant plan, very large, in wood," but he does not assign any date or author. The first person who asserts it to be Agas's production is Vertue. In his note book, preserved in the MSS. at the British Museum, under date 1736-38, appears the following not very intelligible extract—"Oxonia antiqua descriptio Radulphus Agas Año Dñi 1578—near tenn, begins to plotted out." This undoubtedly is the foundation of his subsequent statement before the Society of Antiquaries.

The theory of Mr. Overall was that if Vertue was correct in assigning its original production to 1560, it would appear impossible that Agas was its author, as he died in 1621; and supposing that Agas lived until eighty he would only have been nineteen in 1560. It seems incredible that at so early a period of his career Agas should have undertaken, much less completed, a work of such magnitude. From the lines upon Neale's reproduction of the map of Oxford, published in 1728, there can be no doubt that Agas had not begun London in 1588, when that map was finished, for in it he expressed his desire to portray the city as it then existed, and he gave his reasons why it should, in his opinion, be undertaken. It would seem too unreasonable to suppose that, if he had completed his survey prior to 1561, so remarkable an object as the steeple of St. Paul's, which was destroyed by lightning on June 4 in that year, could have been omitted. If Agas was the author the map could not have been prepared earlier than about 1591.

The size of the original map as given by Vertue is 6 feet 3 inches long by 2 feet 4 inches wide. This has been followed by Gough, Walpole and others. The two existing copies, however, are 6 feet and half an inch long by 2 feet 4½ inches wide. Of this map there have been various so-called *facsimile* reproductions from time to time. The earliest of these is that claimed by Vertue.

Important variations will be found upon a close examination of the two genuine maps, the two unsigned or Dutch copies, and those to which Vertue has appended his name.

First, then, as to the treatment of the waterbearers, a craft of considerable importance in London at this time; they are shown in Agas engaged in their occupation at the Tower Stairs and off the Steelyard in Thames Street, standing in the river filling casks (which are slung across the backs of horses pannier-wise) with a long-handled ladle or small bucket. Vertue, as an Englishman and an antiquary, would readily have understood this ancient custom, but it would be easy for a foreigner to have misunderstood this operation, and have supposed the horses to be cows driven into the river to drink; and it is a curious fact that the unsigned copies omit altogether these figures at the Tower Stairs, whilst at the Steelyard they actually appear as cows, and the man is on horseback, the long-handled ladle being turned into a whip, driving them into the river. Strangely enough, the copies bearing Vertue's name are identical in the treatment of these figures. In Agas is seen in mid-stream off Baynard's Castle the royal barge, on which the arms of Elizabeth are displayed, being rowed up towards Westminster. In the unsigned maps, and in Vertue's copies, this is altogether omitted. The architectural details of Baynard's Castle as shown in Agas are differently treated in the unsigned, whilst in Vertue's we can easily discern the additions made with a dry point, in order to make it more in accordance with Agas. The Blackfriars Stairs as given in Agas are omitted in the unsigned; in Vertue's copies we can easily detect their subsequent insertion. The same remarks will apply to the martello tower at the entrance to the river Fleet and Bridewell Palace. At the rear of Bridewell Palace grounds in Fleet Street, the church of St. Bride, which is faithfully portrayed in Agas, is represented identically in the unsigned and in Vertue's copies as a block of ordinary buildings. The round tower of the Temple Church is a prominent feature in Agas, and the name appears upon it. This historic building, strangely enough, is omitted altogether in the unsigned copies as well as in Vertue's.

On the opposite side of the river, at Paris Gardens, Agas shows buildings close up to the river bank, with stairs leading to the river, and the boats thereat; at the end of the broad road leading up to the buildings from Lambeth a cross is depicted in the centre of the roadway, and on the left of the road is an open ditch crossed by a footbridge. In the unsigned copies and in Vertue's, which are precisely similar in all the details, the stairs, boats, cross, ditch and footbridge are all omitted, and the style in comparison with Agas's is contemptible.

The people walking in the fields wear, in Agas's, the costume of Elizabeth's time, while in the unsigned and Vertue's some of the figures are altogether omitted, and those remaining are in the dress of the time of William III. The lower part of the map near this spot, which Agas depicts as fields, is occupied, both in the unsigned copies and in Vertue's, by printed references to the principal buildings. To the right of these references is shown a field, the boundaries of which in all the maps are the same, but the treatment of the details differs from Agas; in the unsigned and Vertue's copies these latter being

identical even to a line, and in the copies bearing Vertue's name the inscription "G. Vertue, Soc. Antiq. 1737," has been evidently added, like the other alterations, with a dry point, over the previously engraved lines.

Coming back again to the City, it is curious to note that the street leading from St. Paul's Churchyard is not shown, either in the unsigned or Vertue's copy, while in the original map it is most distinctly indicated. The treatment of the London Wall between Ludgate and the river Fleet is exactly similar even to a line in the unsigned and Vertue's, but is singularly at variance with Agas, in which the architectural features of the wall are well defined. Smithfield, again, is very differently treated in Agas from the unsigned, which exactly accords with Vertue.

One other important building calls for particular attention, the cathedral of St. Paul's. In Agas's map the church of St. Gregory and the chapter-house on the southern side are marked features. The unsigned copies indicate houses all along the south-west side, and the church of St. Gregory has no tower. Vertue's copies, however, show the marks of alteration distinctly at this spot. The nave of the cathedral and St. Gregory's church are made to resemble Agas.

After a careful study and comparison of the several maps, and the numerous alterations and inconsistencies, Mr. Overall was reluctantly compelled to confirm the strong statements of Dodd and Ottley, and to believe that Vertue knowingly committed a literary fraud upon his antiquarian friends, of which all antiquaries have since unhappily been the victims. He had doubtless become possessed, by purchase or otherwise, of the pewter plates prepared by some Dutch engraver (name unknown) in the reign of William III. (the conventional treatment, not only of the map, but the costume of the figures, appears very much to strengthen this idea), and then set about altering the plates where they were glaringly wrong, and would otherwise have been at once detected.

INTERRUPTION OF AIR CURRENTS.

ON Monday judgment was given in the Court of Appeal by Lords Justices Lindley, Kay and Lopes, in the important case *Chastey v. Ackland*. It was heard at the Exeter assizes, when judgment in favour of the plaintiff was given by Mr. Justice Cave. The defendant appealed. According to the *Times* report the back windows of the plaintiff's house in the city of Exeter look into a yard 28 feet wide. The house is in a row of houses which have similar courtyards behind them, the yards together forming a space of some length and of the width above mentioned. In these yards are low buildings, including a urinal, opposite to the plaintiff's house, belonging to a drill-hall, which is on the opposite side. The series of yards run north and south. On the same side as the plaintiff's house is the house of the defendant. It is the last house northwards in the row and is three houses distant. The defendant had a low building which closed his yard at the northern end. He has raised this building 16 feet. Also the defendant has built another lower building within his courtyard and opposite to a passage 4 feet wide between another low building and the eastern wall of the drill-hall. The plaintiff complained of these erections on the ground that they diminished the light and air coming laterally to his back windows. The case was tried by agreement by a judge without a jury, and, by consent of all parties, the judge personally inspected the premises. He found that there was some obstruction to light by the building which had been raised 16 feet, and he estimated the damage thus occasioned to the plaintiff at 10%. But he found that the interruption to the air was serious and occasioned a nuisance, and, putting the two things together, on the ground of this interference with the light and the air, he granted a mandatory injunction, in effect ordering the defendant to take down the buildings which he had recently erected, and to restore the condition of the premises to what it had been before that erection. The plaintiff's windows are more than twenty years old. There was a conflict in the sworn evidence as to the effect of the buildings upon the plaintiff's house. The learned judge apparently agreed with those witnesses who said that the air in the plaintiff's yard had become more stagnant, and that the basement of his house had become damp and the air in the rooms stuffy and unwholesome.

Lord Justice Lopes read a judgment, in which he said:—The evidence leads me to the conclusion that there is a want of ventilation and an absence of the means of carrying off bad smells on the plaintiff's premises, and that probably the interruption to the free passage of air over the plaintiff's premises caused by the defendant's new wall has aggravated the mischief which had previously existed. But nothing deleterious, nothing hurtful, nothing disagreeable is brought on the plaintiff's premises by anything which the defendant has done. The bad smell and the stuffiness which interfere with his comfort arise on the plaintiff's premises. Unless the plain-

tiff has against the defendant a right to get rid of this in the particular way which has been interfered with by the defendant he cannot sue the defendant for a nuisance because the smell and stuffiness, arising on his own premises, for which he has not provided any effectual means of escape cause him annoyance. Every man has a natural right to enjoy the air pure and free from noxious smells or vapours, and any one who sends on his neighbour's land that which makes the air impure is guilty of a nuisance, but a man must not impose an obligation on his neighbour by having a want of proper ventilation on his own premises. If any nuisance existed it was not a nuisance created by the defendant, and I am unable to agree with the learned judge in the court below in thinking that the plaintiff has any cause of action against the defendant on the ground of nuisance. The case of *Bryant v. Lefevre* (4 C.P.D. 172) is directly in point, and the reasoning in that case applies here. But it is contended on behalf of the plaintiff that independently of nuisance he has a right to the free passage of air over and above his premises—a right to have any disagreeable smell existing on his premises carried away by the current of air which would pass over his premises—which right the defendant, by his new buildings, has infringed. It becomes necessary to consider what legal right with regard to the free passage of air the plaintiff has against the defendant; what unlawful act the defendant has done which entitles the plaintiff to complain. By raising his buildings on his own land (which he had a perfect right to do) he has to some extent intercepted the free passage of air above and around the premises of the plaintiff. The current of air comes from the defendant's premises laterally to the plaintiff's premises, but through no defined aperture or passage. The air is at large and in no way confined within finite limits. The claim of the plaintiff is not to have the air pass through some definite channel constructed for the purpose of containing and communicating it, but it is to have the current of air float over the whole of the plaintiff's property—over the yard and the rest of his property at the back of the house. Such a right cannot be maintained. The plaintiff cannot, in support of the alleged right, rely on prescription at common law, because the houses have been built within legal memory, nor on prescription by statute, because the right to the passage of air is not a right to an easement within the meaning of 2 & 3 Wm. IV. cap. 71, sec. 2, nor on the presumption of a lost grant from long continued enjoyment, because such a presumption only arises where the person against whom the grant is claimed might have prevented or interrupted the exercise of the subject of the supposed grant. Such prevention or interruption is practically impossible here. Lord Justice Bowen in *Harris v. De Pinna* (33 Ch. D. 262) says:—"Then we come to air. It seems to me that the only claim for air which could be supported here is a claim to the passage of undefined air over the premises of the defendant until it reaches the plaintiff's property. It would be just like amenity of prospect, a subject-matter which is incapable of definition. So the passage of undefined air gives rise to no rights and can give rise to no rights for the best of all reasons, the reason of common sense, because you cannot acquire any rights against others by a user which they cannot interrupt." But it was urged that the right to the access of air had been acquired by an implied covenant, an implied covenant entered into at the time the houses were built, that the owners of the adjoining houses would not do anything to intercept the free passage of air over his neighbour's property. The answer is that there is nothing from which such a covenant can be implied. *Hall v. Lichfield Brewery Company* (49 L.J. Ch. 655) was a case where the plaintiff had for upwards of thirty years enjoyed a free access of air to his slaughterhouse through two defined apertures, and there were circumstances in the case raising the presumption of an implied covenant. It was a user, too, which might have been interrupted. The law will not imply a grant except it is of something definite. The undefined passage of air is too vague. If the plaintiff has been inconvenienced by anything the defendant has done, it is *damnum absque injuria*, and affords no legal ground of complaint to the plaintiff. The appeal must be allowed.

Lord Justice Kay (after stating the facts as above) continued:—Lord Cranworth, in *Durell v. Pritchard* (L.R. 1 Ch. 250), said that the court will not interfere by way of mandatory injunction, except in cases in which extreme, or, at all events, very serious, damage will ensue from its interference being withheld. Applying this rule here, the learned judge seems to have thought that the damage done by interference with light would not alone have justified the granting of a mandatory injunction. The question is, whether the interruption of the current of air past the back windows of the plaintiff's house, in addition to the interference with the light, warranted the court in granting it. It is denied in argument that such an interruption of air constitutes a legal wrong. It is pointed out that there is no diminution of the quantity of air that would enter any window of the plaintiff's house. The defendant has not built anything opposite to any of those windows.

All he has done is to prevent some of the current of air, which, before his buildings were erected, would pass through the series of back yards, including the plaintiff's yard, from passing the plaintiff's windows, and thus the air which enters the plaintiff's house by those windows is rendered less fresh and salubrious. The case is different from the act of a man who fouls the air on his own land, as by brickmaking, and allows that foul air to pass on to his neighbour's land. The defendant here has not fouled the air. By diminishing the current over the plaintiff's yard he has rendered the air in that yard more stagnant, so that, if any foul exhalation mingles with it, that exhalation does not pass away so speedily as it would before. In *Webb v. Bird* (10 C.B. N.S. 268) and in the Exchequer Chamber (13 C.B. N.S. 841) very eminent judges agreed in deciding that building upon a man's own land so as to diminish or interfere with the air which came to the plaintiff's windmill was not a legal wrong, although the windmill had existed more than twenty years. They held that the right to the passage of the air was not an easement within 2 & 3 Wm. IV. cap. 71, sec. 2, and that no presumption of a grant of such a right could be made, because it would have been difficult, if not impossible, for the owner of the adjoining land to interrupt it so as to prevent the acquisition of it by lapse of time. Lord Blackburn, in his judgment, guards himself against saying anything which would affect the common law right which may be acquired to the access of light and air through a window. His lordship referred also to *Bryant v. Lefevre* (4 C.P.D. 172) and *Harris v. De Pinna* (33 Ch. D. 238). On the other hand, there is authority for the proposition that the diminution of the quantity of air entering a house by a defined aperture which has existed for the admission of air for more than twenty years may be a legal wrong. In *Aldred's case* (9 Co. 58b) Chief Justice Wray said that "for stopping as well of the wholesome air as of light an action lies, and damages shall be recovered for both of them, for both are necessary, for it is said, *et vescitur aura aetherea* . . . but for prospect, which is a matter only of delight, and not of necessity, no action lies for stopping thereof . . . and if the stopping of the wholesome air gives cause of action, *a fortiori* an action lies . . . for infecting and corrupting the air." His lordship also referred to *Gale v. Abbot* (8 Jur. 987), *City of London Brewery Company v. Tennant* (L. R. 9 Ch. 221), *Hall v. The Lichfield Brewery Company* (49 L.J. Ch. 655), and *Bass v. Gregory* (25 Q.B.D. 481), and continued:—Now, the question is within which of these two classes the present case comes. It was put in argument as an interference with the air coming to the plaintiff's windows. I have pointed out that the acts of the defendant have not diminished the quantity of air entering those windows, nor have they altered the quality of the air which passes from the defendant's land. The consequence of the air in the plaintiff's back yard becoming more stagnant seems to me to be too remote to make what the defendant has done a legal wrong. But the learned judge seems to have found that the defendant's acts have occasioned a nuisance to the plaintiff. So far as that nuisance results from emanations from the urinals and other conveniences in any of the back yards, the reasoning of the judges in *Bryant v. Lefevre* seems to apply. These are not caused by the defendant, and the remedy, if any, should be sought against the owners of the several erections which emit noxious odours. But can an interference with light or air which is not otherwise actionable be restrained on the ground of nuisance? Lord Justice Bramwell, as I have pointed out, says it cannot. Suppose a man were to build a house on the edge of his own land, with windows for the admission of light and air looking over his neighbour's land. Nothing could be a greater nuisance than completely to block such windows by building a wall immediately opposite to them. But it cannot be doubted that the neighbour might do this at any time within twenty years. It is quite right to say, as Lord Selborne intimated in the words I have quoted, that a diminution of the quantity of air coming to a defined aperture in a house which has existed for twenty years so considerable as to cause a nuisance may be actionable. But that is the only way in which the term can properly be applied to a mere diminution in the quantity of the air. Unless the right to have it come over the land of another has been acquired by lapse of time, the mere diminution of quantity is not a nuisance in law. The result is that the interference with the current of air in this case was not such as to cause an actionable wrong, and the injunction must be dissolved. The judgment should be for 10% damages and costs of the action, save so far as increased by the claim as to air, and the defendant must have the costs of the appeal.

Lord Justice Lindley said:—I concur in the judgments which have been read, but I will add a few words to explain the view which I take of the case, which I regard as an extremely important one. It has been decided that the right to air is not an easement within section 2 of the Prescription Act (*Webb v. Bird*, 13 C.B. N.S. 841). Independently of the Act, everyone has a right to enjoy whatever air comes to him, but

speaking generally and apart from long enjoyment, or some grant or agreement, no one has a right to prevent his neighbour from building on his own land, although the consequence may be to diminish or alter the flow of air over it on to land adjoining. So to diminish a flow of air is not actionable as a nuisance. But, although the Prescription Act does not apply to air, a right to have it come over another's land, in some definite direction to some particular place, can, I apprehend, be established by what is called immemorial user, or by user which may have had for its origin some lost grant or agreement binding on the owners of the servient tenement. In the present case immemorial enjoyment is not alleged, no doubt because the plaintiff's house is not sufficiently old. Then, as to a lost grant or binding agreement to allow air to come freely to the back of the plaintiff's house over the defendant's land, the plaintiff does not prove enjoyment of air coming in any definite direction over the servient tenement, and to burden the servient tenement to the extent necessary to protect the plaintiff from the diminishing of the free passage of air to the yard at the back of his house is, I think, contrary to the authorities, and would be to stretch the doctrine of lost grant further than principle warrants. The subject-matter of the grant is too indefinite. The doctrine, if applicable to one neighbour, would be equally applicable to all, for better and for worse; and there are no grounds for benefiting or burdening all or any of them to the extent necessary to protect the plaintiff in the enjoyment of the right which he claims. The plaintiff did not prove the existence of any covenant or agreement binding the defendant not to build over his own back yard so as to interfere with the comfort of the plaintiff, and there are no materials for holding that any covenant to that effect was ever in fact entered into. But in the absence of such a covenant, express or implied, the plaintiff's claim to relief in respect of air cannot, in my opinion, be supported. The appeal must, therefore, be allowed; the judgment must be reversed, and the plaintiff must have judgment for 10*l* for the injury done to his ancient light and for the costs of the action, except so far as they have been increased by the claim to air, which he must pay. He must also pay the costs of the appeal, and the costs must be set off against each other in the usual way.

THE ROYAL SCOTTISH ACADEMY'S SUPPLEMENTARY CHARTER.

AS already stated, says the *Scotsman*, the Queen in Council has been pleased to pass the supplementary charter of the Royal Scottish Academy. The charter provides (1) for an honorary retired class of Academicians. It is provided that Academicians who through advanced age, infirmity or otherwise, are unable to fulfil the active duties of an Academician, and who desire to be admitted into this class, shall signify their wish by letter to the secretary, and if the application is acceded to at the next ensuing Assembly of Academicians, a vacancy in the list shall be declared and filled up by a new election. The honorary retired Academicians are to be exempted from serving on the Council, on the committee of arrangements for the annual exhibition and as visitors in the schools. They retain their right of attending and speaking, but not of voting, at all general assemblies of the Academy and assemblies of Academicians, and they are to be eligible for election to any other office for which Academicians are eligible. They are to bear the title of Honorary Retired Academicians, retain the right to append the letters R.S.A. to their names, the right to their pensions and the right of exhibiting one work annually, but the number may be increased by special permission of the Council. It is also enacted that Academicians who by a resolution of the Assembly of Academicians, passed by a two-thirds majority after notice, shall be found to have for five consecutive years after the date of the supplementary charter failed to fulfil the active duties of an Academician, may be placed on the honorary retired list of Academicians, and Academicians so placed on the retired list before attaining the age of sixty, for reasons other than ill health or accident, shall have no right to participate in the pension fund of the Academy. (2) Provisions under this head refer to the formation of a honorary retired associate list, and are in the main, with necessary modifications, applicable to associate rank, the same as those just quoted. (3) The Academicians in assembly are to have power to determine from which branches of art represented in the Academy—painting, sculpture, architecture, or engraving—and in what numbers or proportions from each branch, new Academicians or associates about to be elected by a general assembly shall be selected or chosen. The fourth division of the charter refers to the mode in which artists may be nominated and elected to associate rank, and is rather a matter of internal administration than of general interest. The fifth provision deals with the procedure to be followed by an associate after election in taking up this rank; and the sixth declares that no resolution of a general assembly or of an assembly of Academicians on matters other than the election

of members and office-bearers and ordinary routine business shall be valid until it is confirmed by the next general assembly of the Academy or assembly of Academicians as the case may be. The seventh clause was to this effect:—"Without prejudice to the provisions of the said supplementary charter relating to making, altering and annulling rules, we hereby give to the members of the Academy at their assemblies of Academicians power to make rules providing that any member of the Academy who, after the date of this supplementary charter, shall become a member of or exhibit with any other society of artists established in Edinburgh shall forfeit his membership of the Academy, and all the rights and privileges pertaining thereto, provided always that such rules shall not apply to members of the Academy elected prior to the date of this supplementary charter, who may after its date exhibit with any society of which they were members prior to the date of this supplementary charter."

Against this seventh clause objections were lodged by the Society of Scottish Artists on the ground that "the clause is retrograde in character and detrimental to the interests of art in Scotland; that in London members of the Royal Academy are not debarred from being members of, or exhibiting with other societies in London, such as the Grafton and New Galleries, of which the members and associates of the Royal Academy are amongst the most prominent supporters, and the Royal Society of Painters in Water-Colours, whose president is Sir John Gilbert, R.A.; that this power, if granted to the Royal Scottish Academy, would, on the other hand, obviously debar the possibility of there being similar exhibitions in Edinburgh, and thereby vitally affect the existence of the Society of Scottish Artists, which has already done so much to promote the interests of the public in art and to encourage the younger artists."

In answers by the Academy to these objections, it is pointed out that the Royal Scottish Academy provides the only public art school in Scotland. It had long conducted with conspicuous success a life school in which art students have been gratuitously instructed in the principles and practice of the art of painting under the immediate supervision of the members of the Academy, and that in this life school a large number of Scottish artists, including most of the members of the objecting society and all the artist signatories of the objections have received training at the expense of the Academy. The Academy also maintains an art library, to which artists, students and others have access free of charge. While thus performing public functions of the highest importance for the advancement of the fine arts in Scotland, the Academy receives no aid or subsidy from the State. The Academy has no funds available for these purposes except the income derived from the annual exhibition held in Edinburgh; and in order to maintain the attractiveness of the exhibition and to insure the continuance of the revenue derived from it and devoted to the public purposes already mentioned, it is necessary that the members of the Academy should loyally support the exhibition; and the object of the proposed clause is to remove any doubts as to the Academy's right to enact laws, if necessary, to secure that loyalty, which will, it is hoped, be freely rendered apart from any regulations. It is further pointed out that this clause was in the original charter, and although it was dropped out of the 1891 supplementary charter, it was never intended that the Academy should give up all control over its own members. "Membership of the Academy," the answers go on to say, "involves duties and responsibilities, the observance and recognition of which the Academy ought to have power to enforce should occasion demand it, and it is confidently affirmed that the members of the Academy will not claim the right to promote the success of other societies by sending their work to other exhibitions instead of to the Academy exhibitions to the detriment of the Academy, while retaining all the advantages derived from membership of the Academy. If the members of the Academy do not claim such right, it may with confidence be submitted that no other persons are entitled to claim it for them." Figures are given to show that the Royal Scottish Academy has always treated artists outside the Academy with generosity at the exhibitions. In 1894, it says, seventy members of the Academy exhibited 192 works, while the other 218 exhibitors who were not members exhibited 337 works. The answers point out that the objectors are wrong as to the Royal Academy, and that a clause similar to the seventh clause of the supplementary charter is part of the constitution of that body. It might be that the Academy did not stringently enforce the rule, but the rule forms part of its constitution. What, it says, is asked by the Royal Scottish Academy is not that the provision should be made absolute by being incorporated as a positive enactment in the charter, but that the Academy should have power to make a rule similar to the existing rule of the Royal Academy of Arts. It is also pointed out that any analogy between London and Edinburgh is necessarily fallacious and misleading. In London, with its population of nearly five millions, consisting to a considerable extent of travellers from all parts of the globe, there is almost

unlimited scope for exhibitions of art, and of each receiving substantial public support. In Edinburgh, on the other hand, with its population of 260,000, there is no room for the multiplication of exhibitions, and the only effect of multiplying them must be to so dissipate and distribute the support of the art-loving public as to lead to the discontinuance of some, if not all.

On February 21 last the clerk to the Privy Council wrote asking if the Academy would be willing to accept a supplementary charter excluding the seventh clause. To this letter Messrs. Skene, Edwards & Garson, the law agents of the Academy, acting under instructions from an assembly of the Academicians, replied on March 14 that the other provisions of the draft supplementary charter are, in the view of the Academicians, so important that it will be their duty to accept them even if the seventh clause should be excluded. The Lords of the Council are again asked to consider the views of the Academy on the point, and in the letter the answers just referred to are again shortly gone over, it being pressed that the only source of income of the Academy whereby it can discharge its duty to the life school and other art objects is derived from the exhibition, and that it is desirable that the Academy should be enabled to maintain the attractiveness of the exhibition. Unless it is able to do so, it may find itself unable to continue the performance of the teaching functions which had hitherto formed so valuable a feature of its work. The great majority of the members are loyal to the Academy, and all that is asked under the seventh clause is a declaration that the Academy has a claim on the loyalty of all its members. The application for the clause was not made lightly or hastily. The experience of recent years has shown that something of the kind is necessary to maintain the resources of the Academy so as to secure the continued efficiency of the life school, which otherwise may have to be abandoned. Having made the application, and having discharged themselves of responsibility, the petitioners say they must accept the decision of their lordships, whatever it may be.

In the decision of the Privy Council the seventh clause is struck out of the charter, which otherwise has been passed.

THE CONVENT OF MONTE OLIVETO.

A CORRESPONDENT of the *Manchester Guardian* having visited the Benedictine Monastery of Monte Oliveto Maggiore, which is now in the possession of the Italian Government, gives the following account of the works of art to be seen there:—

The chief artistic attractions of Monte Oliveto are naturally the frescoes by Luca Signorelli and Sodoma, dealing with the legends of the life of St. Benedict, which cover the four walls of the great court, and it was to these that I first directed my steps. Whatever opinion we may form in general as to the respective merits of Signorelli and Sodoma (if, indeed, it be worth while to compare two artists so fundamentally different), there can be no question that the frescoes by Sodoma here at Monte Oliveto, as they are more numerous and in better preservation, are also on the whole far more interesting than those of the slightly older master. They both took the story of the life of St. Benedict as it is related in the dialogues of St. Gregory the Great—Signorelli dealing with the saint's life at Monte Cassino, and Sodoma, who succeeded him, with the earlier and later incidents of that life, but, apparently from want of space, the story is not completed. Sodoma's work is particularly interesting because it displays not only that refined, almost morbid feeling for beauty in face and figure which is the main characteristic of the Lombard master, and which the student can observe to perfection in the churches of Siena; but also some qualities which are perhaps hardly so noticeable elsewhere—a power of imparting expression to his faces, considerable humour in the by-play of the scenes, and occasionally a certain amount of dramatic effectiveness. Vasari asserts that the monks dubbed him "Il Mattaccio" on account of the mad pranks he played (though this may refer either to the work of his brush or to his general life at the convent), and he certainly appears to have worked more at his ease than was usual with him, with a greater sense of liberty in the treatment of his subjects, and with the determination of finding as much entertainment as possible in his work. No single fresco by him is more interesting perhaps than the one in which he has painted himself in a splendid dress, with his wife and little daughter prominently among the crowd who are gazing up at the architrave of the church, where is suspended the wooden dish which Benedict's nurse has broken by mischance, and which has been restored by the prayers of the youthful saint. The yellow embroidered cloak, the cap and sword, in which Sodoma has here depicted himself, had belonged, it appears, to a Milanese gentleman who had come to Monte Oliveto to take the monkish habit; and the general of the order sold them to Sodoma. Vasari, whose life of the painter contains several proved inaccuracies, and is, moreover, marked throughout by

obvious personal animosity, states that the dress was given to Sodoma; but that he purchased it for a fixed sum is proved by a document in the archives of the monastery, now at Siena. In other frescoes, again, he has introduced the portrait of the then general of the order, who had offended him by refusing the increased emolument he had asked for, and those of his fellow-artists, Fra Giovanni da Verona and Fra Raffaello da Brescia, and his interest in animal life is shown by the beasts and birds he continually introduces. Altogether we may say that these frescoes show the Lombard as an admirably endowed artist, who through carelessness or impatience of study did not perhaps always do full justice to himself, but who merits far higher praise than that which Vasari so grudgingly doles out to him. These frescoes are not all the work which Sodoma executed for the monastery. On a dark landing, and much faded, is a coronation of the Virgin in fresco by his hand, where the face of the Saviour, the best preserved portion of the work, is of the most exquisite and touching beauty. And in the *sala* of the apartment I occupy is a St. Peter by him in fresco over the door, and, high up on one of the walls a woman's face of much beauty, probably a fragment of an Annunciation. The monastery contains many artistic treasures besides those mentioned. That admirable worker in intarsia, Fra Giovanni da Verona, and his disciple in wood-carving, Fra Raffaello da Brescia, both Olivetan monks, seem to have frequently visited the monastery and done much work here. Fra Giovanni not only executed in intarsia the panels of the choir stalls in the church, of the great lectern (the carved portion of which bears the name of his pupil and fellow-craftsman), and of a cabinet in the library, but he also designed (so the abbot assured me) the capitals of many of the pillars in the courts, wrought in grey stone, not unlike the *pietra serena* of Fiesole, but less durable, and still found in the volcanic tufa of the neighbourhood. In a niche in the passage leading to the church and immediately above a square marble slab let into the pavement, bearing the words (how eloquent in their simplicity!) "*Monachorum Sepulchra*," is a beautiful marble statuette of the Virgin and Child, with the date 1490, which has been attributed it seems to Benedetto da Majano, but which the abbot believes to be likewise by Fra Giovanni da Verona. There are many frescoes or fragments of fresco in different rooms of the monastery, some by inferior artists, but others of great beauty, and fresh ones are frequently being discovered under the whitewash with which they have been barbarously concealed. One of the most beautiful is a round fresco in the linen-room, a Madonna and Child, with an Olivetan monk imploring their protection, a work of extreme loveliness, which has been attributed—it would appear, without much reason—both to Benozzo Gozzoli and to Matteo da Siena. Nothing can well be more charming than the rapt devotion in the monk's face, the smiling assurance of the Madonna, and the gracious attitude of the Child. To the hand of Pinturicchio is attributed a fresco in the choir niche of the chapel of S. Scolastica, which has been much retouched, but where the angels, playing different musical instruments on each side of the glorified Madonna, are certainly quite in the manner of that master. Altogether it may be said that Monte Oliveto provides the art student with abundant material for study and with several problems which still await their solution.

THE HELLENIC SOCIETY.

ON Monday was held the annual meeting of the Hellenic Society. The council in their report, after congratulating the society upon a session of steady progress and good work, expressed regret at the heavy losses sustained during the last year by death. The obituary record included Sir Charles Newton, Professor Gustav Hirschfeld, of Königsberg, who was in charge of the excavations at Olympia when the *Hermes* of Praxiteles was discovered, Sir Henry Layard, Sir James Lacaita, Professor Stuart Poole, Professor A. C. Merriam (of Columbia College, one of the most accomplished of American archaeologists), Professor H. C. Goodhart (of Edinburgh), and Dr. Greenwood (formerly Principal of the Owens College, Manchester). Professor Heinrich von Brunn and Mr. George Dennis had ceased to be honorary members, and their places had been taken by Professor Furtwängler and Professor Petersen. As in former years, the council had been called upon to support various projects of excavation and exploration. The most important was a scheme for excavations in Alexandria, conducted under the direction of Mr. D. G. Hogarth, and in concert with the authorities of the Egypt Exploration Fund. After careful consideration the council voted the sum of 100% towards the experimental excavations which, it was thought, would serve to show whether any substantial results were to be expected. After some months' trial Mr. Hogarth came to the conclusion that for all practical purposes ancient Alexandria did not exist. As soon, therefore, as he had proved the ruinous state of the scanty remains Mr. Hogarth held his hand, and about a quarter of the grant would be returned. Smaller grants of 25% each were

voted to Mr. J. A. R. Munro for exploration in Asia Minor, and to Mr. J. L. Myres for exploration in the island of Amorgos, though in the event the latter was not applied for. The usual grant of 100*l.* had been made to the British School at Athens, two of the students of which institution—Mr. E. F. Benson and Mr. Bevan—worked under Mr. Hogarth at Alexandria. A determined effort was now being made to place the school upon a sounder financial basis. The council sincerely hoped that the effort might be successful, feeling convinced that the maintenance of the school was of vital consequence to the promotion of Hellenic studies in this country. Within the last few months a scheme had been laid before the council for publishing from time to time illustrated catalogues of the numerous private collections of Greek antiquities which existed in this country, and arrangements had been made for carrying the scheme into effect as opportunity might offer. It was thought that such catalogues would be of immense value to students and of general interest to many members of the society. Probably a first instalment of these catalogues would appear in the course of the coming year. The treasurer's accounts showed ordinary receipts during the year of 910*l.*, against 1,034*l.* during the financial year 1893-94. The receipts from subscriptions, including arrears, amount to 692*l.*, against 715*l.*. The receipts from life compositions amounted to 50*l.*, against 79*l.*—a falling off of 29*l.*; and receipts from libraries and for the purchase of back volumes to 122*l.*, against 229*l.*—a decrease of 107*l.*. Receipts from other sources of ordinary income showed no material alteration. Since the entrance fee was imposed, in January 1894, about 50*l.* had been received from this source, a very substantial addition to the society's income. In the matter of ordinary expenditure, amounting to 730*l.*, against 894*l.* in the previous year, there was an increase of 7*l.* in respect of rent, while the stationery, printing and postage remained as last year—at 49*l.*. The expenditure on the library had been 96*l.*, against 75*l.* in the preceding year. The cost of the Journal, vol. xiv., parts 1 and 2, had amounted to 441*l.*. Besides the annual grant of 100*l.* to the British School at Athens, 125*l.* had been granted for other purposes, and a balance was carried forward at the end of the financial year of 169*l.* 7*s.* 6*d.*, against 214*l.* 10*s.* 7*d.* at the close of the preceding year. Forty-one new members had been elected during the year, while twenty-six had been lost by death or resignation. This showed a net increase of fifteen, and brought the total number of members up to 784. In conclusion, the council felt that the society was in a thoroughly healthy condition. The number of new members was fairly satisfactory. The work done or in contemplation was such as fully to maintain the society's reputation for enlightened zeal in the cause of Hellenic studies. The report was adopted.

THE PROPOSED WORKS AT PHILÆ.

IN his report to the Government on the progress of reorganization in Egypt, Mr. Villiers Stuart, the Egyptologist, writes:—As connected with the subject of irrigation and the question of the projected reservoirs at Philæ, I visited this island in order to judge for myself of the effect of restoring the walls with which it was once surrounded and raising them to a sufficient height to keep out the water in case the scheme of a great reservoir at this point was carried out. I traced the foundations of the original wall in its entire circuit; it was about 700 yards in circumference. At one point there is a natural wall already, of more than sufficient height, consisting of immense granite boulders; this formation might be imitated at intervals in the new wall so as to break its formal appearance and give it a certain correspondence with Biggeh and the other islands around. Within the enclosure there would be a distance of about 60 yards between the west wall and the temple, but considerable less on the east. The chief temple faces south, and the space intervening between the façade of the great pylon and the southern extremity of the island, more than 100 yards in length, is disfigured with mounds of mud bricks, the relics of Arab and Coptic houses. This could be levelled and planted with palm groves, or converted into a botanic garden; this would form a picturesque and artistic setting both for the colonnades right and left and for the main temple itself. Thus within the enclosure, so far from the monuments being spoilt, they would, on the contrary, be set off to advantage, and rescued from their present squalid surroundings—an important improvement.

Externally the island would lose some of its picturesqueness, but not to the extent that might be supposed, for the palm groves and the higher portions of the temple would show above the enclosing wall, and Philæ would be more assimilated to the neighbouring islands. There would be nothing inconsistent with ancient traditions in the wall itself; all Egyptian temples were surrounded with high walls and embankments, and Philæ was no exception; it would be simply a restoration, but an improved one. The opposition to the scheme on the part of artists and archaeologists is based on misconception; most of

the opponents would be converted if brought to the spot and the effect explained.

The most important eclipse of the picturesqueness of Philæ would be while the reservoirs were full, but at that season it is not visited either by artists or archaeologists, and as the level sank Philæ would emerge uninjured in every respect.

Whether Assouan be the best point for the reservoir is an engineer's business to decide, but if it be, I have no hesitation in saying that the question of the Philæ monuments ought not to and need not interfere. The monuments would benefit rather than otherwise. I say this as an Egyptologist as jealous as any of my compeers for the conservation of every relic of the past. I met a well-known brother Egyptologist shortly afterwards who entirely agreed with me in my view.

NORTHERN ARCHITECTURAL ASSOCIATION.

AN outdoor meeting of the members of the Northern Architectural Association was held on Saturday last for the purpose of visiting the new tennis court erected by Captain Sir Andrew Noble within the grounds of Jesmond Dene House, from the designs of Mr. F. W. Rich, architect, who conducted the party over the building, and explained the nature of the game and its requirements. He mentioned that tennis courts of this description were not at all common, only thirty-three being known to exist in the United Kingdom. Among the oldest of these is that at Hampton Court, another being at Lord Salisbury's seat at Hatfield. Sir Andrew Noble's tennis court has been built by Messrs. Lesslie & Co., of London, who have also constructed other modern courts. Sussex bricks have been used throughout the building, which covers an area of about 800 square yards, including the bath and dressing rooms and marker's residence. Subsequently the party proceeded to inspect the reception-room at Jesmond Dene House. This mansion, the nucleus of which was originally built in 1822, has, during the last quarter of a century, been amplified by Sir Andrew Noble—Mr. R. Norman Shaw, R.A., and Mr. F. W. Rich acting as his architects. It now forms an imposing and picturesque feature in the finest part of Jesmond Dene. A vote of thanks to Sir Andrew Noble, and another to Mr. Rich for conducting the party, concluded the proceedings.

GENERAL.

The Harborne Charity Trustees have appointed Mr. Ralph Heaton (architect and surveyor, of Grosvenor Chambers, Birmingham) surveyor to their estates.

Mr. Arthur Oddy, of West Hartlepool, has out of over sixty applicants been appointed surveyor by the Pontefract Town Council.

The Chamber of Deputies in Lisbon was on Monday destroyed by a fire caused by the neglect of a plumber who was engaged in soldering the roof. The building was without architectural interest.

The Parish Church of Crathie, near Balmoral, was opened on Tuesday. It was designed by Mr. A. M. Mackenzie, A.R.S.A., and has cost about 6,000*l.*

Mrs. Gilbert, the widow of the late Josiah Gilbert, the author of books on Italian art, has presented to the University of Oxford two studies which are believed to have been prepared by Titian for his *Battle of Cadore*, a picture which no longer exists.

The Fishmongers' Company have contributed 1,500*l.* to the fund for the decoration of St. Paul's Cathedral, that sum being the cost of the mosaic in the chancel dome representing the Creation of Fishes.

Mr. G. E. Bissell, an American sculptor, has obtained a commission for the fourth panel of the pedestal of the Burns statue in Ayr. The subject selected is the parting of the poet and Mary Campbell.

Mr. Val Prinsep, R.A., will to-morrow open the sixth annual loan collection of pictures obtained for the benefit of the people of Southwark and the Borough, and which will be seen at the local Polytechnic in Borough Road.

The Hon. Philip Stanhope, M.P., has been appointed a trustee of the National Portrait Gallery.

The Albany Capitol, on which more than 21,000,000 dols. have been expended, has been entrusted to another commission, who will endeavour to complete the building. The estimated outlay is 3,000,000 dols.

Wilhelm v. Lindenschmidt, the historical painter, and one of the leading artists of the Munich School, has died in that city after a surgical operation, in his sixty-sixth year.

The Basement of the Ashmolean Museum, Oxford, has been assigned to the curators of the Bodleian Library.

A Steel Tower is proposed for erection as part of the Buda Pesth Exhibition in 1896. It will be 500 mètres high; the Eiffel Tower is 300 mètres. M. Husz has prepared the plans.

The Architect.

THE WEEK.

THE students of the Royal Academy have reason to lament the loss of JOHN EVAN HODGSON, who died suddenly on the 19th inst. As professor of painting and librarian he was ready to go far beyond the limits of official duties as they were defined by his predecessors in order to help any one who sought his aid. Among all the Academicians there was not one who was so competent to take charge of their valuable collection of books. He took delight in them, and, like PROSPERO, he considered he possessed a dukedom while he was among them. But it must be said his librarianship was not advantageous to him as a painter. He was always disposed towards the scholar's melancholy, and the sight of engravings and photographs and the other records of the great artists made him feel every day less and less confident in his powers to measure himself with Italians, Flemings and Dutchmen. His natural fastidiousness was increased by the studies for his lectures as professor, for he felt he ought to exemplify the advice he gave students by the excellence of his own pictures. Mr. HODGSON therefore suffered to an extent which the easy-going holders of the professorship could not understand. He was not a strong man in physique, and he laboured under the disadvantage, which arose from the honesty of his nature, of being unable to hold on by one class of subject persistently, as if it alone were worth painting. There was more versatility exhibited by him than by the majority of his contemporaries. Historical, domestic, Eastern and imaginative figure pieces were produced by him as well as landscapes. The consequence was that frequenters of the Academy would not be at the trouble to discover whether he possessed a style of his own. English amateurs believe in specialists, for their works are easily recognised, and the critical remarks of one season will serve for many. There was too much unworldliness about Mr. HODGSON to enable him to realise that condition of success. He laboured, too, under another disadvantage. He belonged to a family of northern journalists, and he possessed literary skill of an exquisite kind. We have no hesitation in saying there are unsigned articles by him in *The Architect* which neither Mr. RUSKIN nor any writer on art in this generation has surpassed. His signed articles and published lectures hardly do justice to his genius, for his instinct was journalistic and retiring. When he stood forth as J. EVAN HODGSON, R.A., he appeared out of his natural element, and curbed his power. It was when he could be emotional without any apprehension of being thought affected by cynics that he was most delightful. Under many difficulties imposed by nature and fate he carried out his duties in an exact way, and he will be regretted by all who enjoyed the blessing of his acquaintance as one of the best of men.

THE titles of some of his pictures in the order of their appearance in the Royal Academy will indicate his efforts to win success. Beginning with 1857, we find "Arrest of a Poacher," "Canvassing for a Vote," "The Patriot Wife," an Austrian scene, "A Rehearsal of Music in a Farm-house," "Sir Thomas More's Daughter in Holbein's Studio," "Return of Sir Francis Drake from Cadiz," "First Sight of the Armada," "Queen Elizabeth at Purfleet," "Taking Home the Bride," "Jewess accused of Witchcraft," "Evensong" (interior of Tong Church, Shropshire), "Chinese Ladies and European Curiosities," "Roman Trireme at Sea," "Arab Story-teller," "Arab Prisoners," "The Basha's Black Guards," "Arab Shepherds," "The Outpost," "An Arab Patriarch," "Army Reorganisation in Morocco," "The Snake Charmer," "A Fair Customer," "Jack Ashore," "A Tunisian Bird-seller," "A Needy Knife-grinder," "Returning the Salute," "Oddfish," "A Barber's Shop in Tunis," "The Talisman," "A Cockfight," "The Turn of the Tide," "The Temple of Diana at Zaghuan," "Better have a New Pair," "Following the Plough," "Commercial Activity in the East," "Pampered Menials," "Relatives in Bond," "An Eastern

Question," "Loot," "The Pacha," "Say what shall be my Song to-day," "I'll serenade no more," "Gehazi, the Servant of Elisha," "The French Naturalist in Algiers," "Homeward Bound," "Bound for the Black Sea," "A Shipwrecked Sailor waiting for Sail" (diploma work), "A Day Far Spent," "Ilka Lassie has her Laddie," "Painter and Critic," "Hobbema's Country," "In the Low Countries," "Ragassellma: the Water Dance," "Robert Burns at the Plough."

UNLIKE Mr. HODGSON, his fellow-academician, HENRY MOORE, who died in Margate on Saturday morning, was most restricted in his class of paintings. The heads in profile or the corpses lying at full length, by M. HENNER, were not more easily recognised at a distance by visitors to the Salon than were Mr. MOORE's seascapes in Burlington House. They were generally of a bright blue, and the waves were shown as they appeared on days of sunshine. A stay-at-home traveller looking on them must believe that what was said about the terrors of the Channel was exaggerated, for water that was so placid seemed unlikely to strain the smallest boat. His pictures were like an argument against the Channel Tunnel. But the public were gratified by the repetitions, otherwise Mr. MOORE would not have persisted in his treatment. His landscape in this year's Academy suggests how admirably he could paint in a different manner if he were free, but patrons and dealers are exacting. No one could suppose he was insincere in his work. Mr. MOORE preferred to look on Neptune in one mood, and what he saw he recorded. Like his brother ALBERT, he believed repose was an advantage in art, and the idyllic figures of one artist would be the most fitting voyagers on the quiet waters which the other painted. It must have been a happy home in which they were both reared to have perfected so peculiar a temperament in them. During many years they had to be patient, while inferior artists were accepted by the Academy as their superiors. Yet the slights did not affect their art. Both went on painting as if they lived in Arcadia or some other ideal world, and at the close of their career they seemed hardly to have once tired themselves. The best tribute to their ability was that everyone considered they were capable to produce works of a different class, and superior in quality, to any which bore their names.

It is wrong for a clerk of works to pose as an architect, but as any man or woman can do so with impunity the offence is not unpardonable. But if in addition he poses as a building owner the law will not spare him. That has been the experience of a clerk of works at Scone, in the North of Scotland. He ordered a firm of painters to execute some work at a villa, and as he would not pay it was necessary to bring an action against him. His plea was that he was the architect, and as he disclosed the name of the principal he could not be held liable. The sheriff decided there was no disclosure, and in consequence a decree was given against the clerk of works, and the builder who joined with him in the action. The case has a moral, for if an architect does not explain clearly for whom he is agent, he must be treated as a principal, and have all the privileges attached to responsibility.

AN interesting case on account of its novelty is now before the Irish Courts. It comes in the form of an application to make absolute a conditional order for a writ of mandamus directed to Mr. BRETLAND, surveyor, of the City of Belfast, to compel him in his official capacity to approve of certain plans of buildings proposed to be erected on the south side of North Street, Belfast. The Corporation had acquired grounds and buildings for the purpose of widening North Street, and Mr. ROBB, the relator in the case, was conveyed a plot, one side of which was bounded by a laneway, at a yearly rent of 400*l*. He proposed to erect two shops on this plot, and the plan showed windows overlooking the laneway. The city surveyor refused to approve of the plans, on the grounds that, if carried out, they would interfere with the erection of buildings on the adjoining property, and would also interfere with the line of the new street.

ILLUSION IN PAINTING.

EVERY picture must to some extent give rise to an illusion, for otherwise it would not produce much effect on the mind of a spectator. For a moment we imagine, with a little vignette of TURNER before us, that we are looking at a wide region of country and sea, hills and valleys, trees and streams illuminated by sunshine. It hardly needs any exercise of reason to be convinced that we are really gazing on a scrap of coloured paper a few inches square. The magic of a great artist like TURNER compels us to forget the actualities of space, just as an artist in literature can persuade us by means of written or printed characters that we have real men and women not only talking but suffering before our eyes. We need not be ashamed when we are deceived by books or pictures like those of SCOTT or TURNER, for our reason is subjected by the power of genius. But there is deception of another kind which is not accompanied by any satisfaction. A man with trained intellect, if he were not aware of the facts, might give credit to DEFOE's narrative of Mrs. VEAL's return from another world, or at least believe in its sincerity, but he would not be easily taken in by a circumstantial account of a miracle wrought by means of a patent medicine. Yet the two literary efforts are alike in character; one was intended to puff an unsaleable, because it was a worthless, book, the other puffs drugs that, if worthless, are generally harmless. If a visitor to the Brussels Gallery on a winter's day were puzzled at seeing the little ladybird in M. ALFRED STEVENS's charming *Bête à bon Dieu*—which is, as everybody knows, a portrait of a comely dame—his critical acumen would hardly be affected; but if he were frightened for a moment by the dog starting from his kennel in the WIERTZ Musée in Brussels, or ogled momentarily the women looking out of the wall, or pitied the man behind the prison grating, he would be considered no more of a connoisseur than the Flemish boors who find so much enjoyment in the odd but clever collection. If WIERTZ were living he would maintain that he simply performed on a grand scale the same trick which the fashionable portraitist attempted on an insignificant scale with his ladybird.

Both artists could justify their conduct not only by Flemish precedents, but by some derived from the great periods of art. ZEUXIS has gained as much renown by the story of the birds that tried to peck the grapes in his picture as by the merits of his *Helen* or his *Family of Centaurs*. If ZEUXIS were competent to deceive men and birds, he could be also overcome, for he took a curtain painted by PARRHASIUS for a genuine piece of weaver's work. Every Academy student is bound, if he be anxious to attain membership, to put his faith in REYNOLDS's Discourses, in which the wisdom of the CARACCI as guides is expounded. ANNIBAL exhibited wisdom when he acknowledged his own weakness of vision. "BASSANO," said the Master of the Eclectics, "performed miracles which surpassed those recorded of the Greek masters. They deceived beasts, but he deceived men, for I can testify that one day when I was in his room I tried to take up what appeared to be a book, and to my astonishment I found that my hand touched a painting." There was no reproof or warning expressed by ANNIBALE CARACCI; he considered rightly that a man must have extraordinary power of handling who could produce so successful an illusion. The majority of the Greco-Roman, if not the Greek, artists would agree with him. How many paintings are found in Pompeii which were evidently intended to deceive all who looked at them? Triptychs are represented with leaves at different angles; delicate architectural structures appear to stand out from the walls, and to reveal glimpses of landscapes through the columns; phantom feasts are laid as if ready for guests. Strictly speaking, Pompeian art of that class is not of much higher value than the chalk drawings on London pavements; but as shrewd Cockneys take more pleasure in looking on the cuts of bacon and salmon which are produced before their eyes than on the masterpieces in the National Gallery, we must not be too hard on the masters of the world if they admired the freaks of perspective on the walls of their villas.

It is not sufficiently understood how close is the relation between breadth in the genuine sense of the word and those sleight-of-hand effects which produce illusions. One sees a flowing white beard in a portrait by REMBRANDT,

and the hairs appear as if they could be counted. But when scrutinised closely the beard is found to have been produced by two or three strokes of a large pencil. The portraits by the pre-Raphaelite artists, on the other hand, which were elaborately worked out, were as little illusory as the diagrammed figures of the Science and Art Department. Occasionally Mr. HOLMAN HUNT exhibits a portrait in the old way, but, enormous as was the work expended on them, nobody could confound any of the accessories with realities, and the countenance is not suggestive of what is commonly called "a speaking likeness." Mr. RUSKIN was therefore backing his friends when speaking of portraiture in general—that is, of external nature as well as of man—he said, "It is possible to represent the body without the spirit; and this shall be like, to those whose senses are only cognisant of body." It is not with spirit the producers of illusions attempt to meddle.

Most of the illusions in painting are intended to express body in a way that will reveal thickness and solidity as well as the length and breadth which logically should be the only attributes of a representation on a plane. The legendary grapes, curtains, books, flies, are all examples. When CHARDIN and OUDRY competed in the imitation of a bas-relief, at first sight both works were considered to have equal merit, for both had to be touched in order to gain certainty they were paintings. OUDRY, who was the inferior painter, was more dexterous in producing effects, although his proportions and contours could not sustain comparison with his rival's. Now this solidity is only obtainable by skill in treating light and shade. The paintings by WIERTZ in Brussels have many defects, and anyone who is acquainted with masterpieces will find it difficult to give much attention to them. Yet in all of them there is powerful if misapplied light and shade. Not one of the figures represents a being in whom it would be possible to take any interest; but, dislike them as we may, there is no denying they are more obtrusive than the majority of painted things. A curator of the gallery is therefore to be pitied, for the terrible beings he sees daily must soon appear to have more vitality than himself, unless he has acquired sufficient knowledge to discover the falsity of the painter's system, when he is sure to despise the chimeras, which are only the creations of a mind diseased.

The painter is able to gain delusive effects because light and shade is so often a conventional arrangement. Light can be supposed to fall at any angle, and to have as much intensity as is desired. Chiaroscuro is, in fact, an affair of logic, a drawing of conclusions from assumptions, and as long as there is apparent consistency throughout in its treatment a picture becomes satisfactory in that respect. If some parts of a picture were in accordance with the illumination of Morocco, and others were derived from what is commonly seen in London, the incongruity would be as striking to ordinary intelligence as the combining of a lion's head with a horse's neck. It may be objected that REMBRANDT's chiaroscuro is unnatural because it is unlike CAGLIARI's, and that CORREGGIO's system is absurd if compared with VELASQUEZ's; but as long as each artist is consistent to the principle he adopted on setting out, his works become effective. Let unity be disturbed by an endeavour to combine two systems, and the picture will have a distressing effect upon all who see it.

As a rule painters avoid the human figure when they decide on deceiving spectators. In some panoramas figures cannot be avoided, but *vraisemblance* is gained by a skilful use of accessories that are real. The painting of a wounded soldier, which by itself would be commonplace, becomes pathetic when seen through the wheel of a wagon and surrounded with some of the débris of a battlefield. It is related that COYPEL, the French painter, was able on one occasion to compel people to salute a portrait he had painted as if it were the subject. But the circumstance is no proof of extraordinary ability. The portrait was placed near a table so as to suggest a man seated, a favourable hour was chosen for the exhibition, and drapery was arranged to diminish the risks of discovery. COYPEL acted like the proprietors of the portrait of St. VERONICA's veil exhibited some years ago in Pall Mall. The eyes appeared to open and close with a regularity that was painful, but without the draped chamber and the carefully subdued light the phenomenon would not be apparent. To the

multitude it was more marvellous than the eyes in portraits, which appear always to be turned towards the spectator. They surprise some simple people, but we never heard of a burglar who turned aside scared from an example, or from the eyes of a gallery of portraits, no matter in what direction they looked.

It is astonishing how soon effects which are startling become tiresome. Like imitations of peculiar sounds in music, or of lace and other transparent fabrics in marble, they are destined to bore those who were first surprised. On that account we have often admired the tact of Mr. ALFRED STEVENS. If he tried to deceive, at least it was in a venial manner, and the most rigorous judge if power were given to him would not decree the removal of the little beetle. If all illusions were as innocent it would be fortunate for art.

THE WESTMINSTER BASILICA.

ALTHOUGH the laying of foundation stones is not, fortunately, a rare occurrence, it may be assumed that very few of the laymen who will be present at the ceremony in Westminster which is to take place to-morrow are likely to again witness a similar sight. The Truro Cathedral is the only building of its class which was erected by the Church of England since St. Paul's was completed, and the interval which separates St. Paul's from the latest of its predecessors is also long. The Roman Catholics on account of poverty can only indulge in the gratification of erecting pro-cathedrals, and the financial history of the Kensington building is not encouraging for those who wish to take part in similar undertakings. In spite of extraordinary offerings like the Manning Testimonial Fund, the existing pro-cathedral, because of its indebtedness, cannot be consecrated. It might be assumed that shrewd men of business like Cardinal VAUGHAN and his advisers would hesitate about erecting a new cathedral until the debt on the building that served and can still serve for all episcopal functions had been cleared off. We have no wish to say one word which would be an obstacle to the erection of new cathedrals throughout England, but everyone with experience in building is aware that whenever an important work falls quickly under the stigma of mortgage, it becomes a warning which prevents people from entering upon less uncertain speculations. For the sake of architects and builders in general we therefore trust that none of the Benedictines who are to be installed in the new basilica will have to suffer martyrdom from duns, which, according to rumour, has been the fate of more than one of the administrators in Kensington.

The proposed building is another instance to show how much importance can be attached to a name. When the Roman Catholic dioceses were arranged in the Papal Court about forty years ago, care was taken to avoid, whenever possible, the assumption of the titles of the bishops of the English Church. As there was a Bishop of London and a Bishop of Rochester, the heads of the new metropolitan dioceses were designated Archbishop of Westminster and Bishop of Southwark. It is requisite that episcopal titles should have a geographical basis, if it were only *in partibus infidelium*; otherwise Westminster is now too circumscribed to express the wide region which is comprised within the boundaries of the arch-diocese. Whatever signification may be attached to the title, a sense of fitness would dictate that a cathedral in London should be in a central position. One of the objections to the Kensington building arises from its suburban and West End site, which is supposed to make it unfitted to be considered as the church of the Metropolis. There are of course numerous associations with Westminster, but the most imaginative archaeologist would hesitate to say they extended as far as the end of Victoria Street and Vauxhall Bridge Road. No doubt it is an advantage for an archbishop to be near the Houses of Parliament, and, according to Mr. LUCY, at one time "the spare figure of Cardinal MANNING, with his pinched, bloodless, intellectual features, was as familiar in the lobby as that of the average member." That cause might serve for the selection of a site in the rear of Victoria Street as a residence. But it is not reasonable to conclude that such a spot is most suitable for a cathedral, for in very few cities of Europe are the bishops to be found living near

their chairs. From a surveyor's point of view, the single advantage which appears to belong to the site arises from the proximity of the Victoria Station, which will bring it into communication with various parts of the diocese.

If there is a mystery about the selection of the site, there is another attached to the selection of a style. We need hardly say there is no official or prescribed style for Roman Catholic churches. Nor was there one at any time. There were always contests enough in Rome without entering on a battle of styles. As a corollary it follows that no style is prohibited, and as mosques have been utilised for churches in Spain there would, we suppose, be no difficulty about the dedication of a new church which had been designed in the Moorish style if the symbols were omitted. For everything ancient there is a kindly feeling among the Vatican authorities. Cardinal NEWMAN wrote a pregnant passage on this subject. "What the Catholic Church once has had," he said, "she never has lost. She has never wept over, or been angry with, time gone and over. Instead of passing from one stage of life to another, she has carried her youth and middle age along with her, on to her latest time. She has not changed possessions, but accumulated them, and has brought out of her treasure-house according to the occasion things new and old. Things incompatible in nature coexist in her; her prose is poetical on the one hand, and philosophical on the other." When the late Cardinal obtained an opportunity to erect a University chapel he acted on the principle he expressed, and out of the "treasure-house" of styles selected the basilican. The building had as much success as was to be expected from the novelty of its parts, especially as they were arranged by the hands of an amateur architect, but it attracted no students to the neighbouring class-rooms. They may have thought that a church in which an exterior space or vestibule was reserved for catechumens (if any could be discovered) was a type of the system of education that was founded on theology, and not adapted for secular students who were not initiated into things which are outside a prosy and material world.

That the basilican style was well adapted for use during one period of the history of the Church there can be no question. According to MACAULAY, the Roman Church is the masterpiece of human policy, and never was that policy more apparent than in the utilising of basilicas. They served so many purposes, it would be hard to say which was the primary one. They were law courts, exchanges, bazaars, assembly-rooms, but as well as can be made out they never served as temples. In size and proportion they varied, but the normal plan was to have a nave or testudo with an aisle or porticus on each side, the tribunal being at the side opposite the vestibule. According to the recipe of VITRUVIUS, the breadth was not to be made less than the third nor more than half the length, unless the nature of the place was against either proportion. Each porticus was to be one-third of the width of the nave, and its lower division was to be as high as it was broad. For the porticus consisted of an upper and lower part, and, as the upper was enclosed for most of its depth, the occupants could not be seen from below.

When it became necessary to provide places of worship for Christians, there would be nothing extraordinary in allowing them to increase the purposes for which the basilicas were used by holding services at times when they were not needed by litigants or merchants. We cannot believe that public or private basilicas were generally made over to the Roman clergy and congregations as soon as Christianity ceased to be persecuted. The Christians had also gone through a course of discipline which would teach them to accommodate themselves to circumstances. It would indeed be preferable in one sense if the basilicas before or after the religious services continued to be employed as law courts, for which apparently they were originally designed. We can easily imagine how more influential a body of mysterious zealots who claimed power of binding and loosing of souls would appear if they sat on the judgment seat of the Old Bailey, especially to a congregation of Whitechapel neophytes. The rigorous penances imposed would seem to be righteous. The absolution would be the removal of a load as oppressive as CHRISTIAN'S when he set out on his pilgrim's way. The clergy sat upon the tribunal of the basilicas and faced the

people. There they presided over the commemorative rites. It should be remembered that a coena or supper was celebrated, and by arranging themselves around three sides of a table, which could be done within the tribunal enclosure, more resemblance was given to the Roman practice at meals. The curved end was not to be always found in Roman basilicas, nor was it indispensable for the performance of the Christian mysteries. When the office of the bishop assumed greater importance it may have been supposed that his chair became more effective with a semi-circular background.

In course of time the power of the unseen was, we may imagine, more irresistibly felt when it was not supposed to be personified by a few humble men. As soon as the clergy ceased to gaze on the congregation from behind the altar the basilican style diminished in importance. Every rectangular church having a nave and aisles, with or without galleries, must have much in common, but a basilican church was a spiritual although public place of justice, and as the infliction of sentences became less public it was no longer necessary to retain its form. Nor was the basilican an elastic plan. It was adapted mainly to a single-altar arrangement, and Gothic and Renaissance plans were more conformable to developments of practice. If we remember aright, Dr. NEWMAN respected precedent, and introduced only one altar in his basilican church, but at Westminster we suppose the more modern arrangement of a number of chapels and altars will be adopted. The putting forth of the church of St. Ambrose in Milan as one of the models points to that end, for it has an abundance of chapels; but, interesting as its history is, it has been truly described to be "a chaos of architecture," and it represents the growth of centuries, the adaptations produced by doctrinal development. It is the most complex of guides to follow for a nineteenth century church. One of the characteristic features of the building, or group of buildings, is the fore-court, but of what use would be a copy for a modern London church?

The practical advantages of the revival of the basilican style are, therefore, not manifest. To suit the Roman ritual there must be departures from the original simplicity of plan, and the unity of the style will therefore be broken. Is the quaintness or novelty worth so great a sacrifice? It may be said that in Munich there is the basilica of St. Boniface. Munich is, however, a city of reproductions, and it would be remarkable if an example of so historic a type of church architecture were omitted. Besides, it was considered that a building in that style would supply an ample field for the wall-painters, who, the King of BAVARIA fancied, were equal to a chapter of theologians. The basilica is spacious, without dim religious light in any part. From the elevation given to the high altar the ceremonies can be seen by all, and marriages when celebrated at that altar assume a little dignity. But in some of the modern French churches—the Trinité in Paris being one—as much effect is gained, and there is no clashing between antiquity and modernity. The Paris church is logical throughout, and there is no endeavour to gain importance by anachronisms. Men and women feel it is in relation with their everyday lives rather than with a vanished world. Why is not the opportunity taken for a similar experiment in London? Are Churchmen to be always in terror of modern ideas, and are bricks which are not arranged in stock patterns to be anathematised? Mr. BENTLEY'S Gothic work proves him to be a master in the art. We may assume that his work at Westminster will be as excellent as circumstances permit, but he will be hampered by conditions which are not conducive to that liberty which is requisite in the production of all noble art.

At the Meeting of the Wolverhampton Board of Guardians, the workhouse accommodation committee presented a report with regard to providing additional accommodation. The conclusion they had come to was that it was desirable that the opinion should be obtained of an experienced architect. They had, therefore, unanimously resolved to ask the Board to empower them to instruct Mr. W. H. Ward, Birmingham, to inspect the workhouse at a fee of thirty guineas, and report as to the practicability of reconstructing, altering and enlarging it on the present site so as to provide accommodation for 1,200 inmates.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute of Architects was held on Monday evening, Mr. F. C. Penrose, president, in the chair, the business being to confer the gold medal on Mr. James Brooks.

Royal Gold Medal.

The PRESIDENT, in his address, said:—The first and very agreeable duty which we have before us this evening is, as you are aware, that of handing, in Her Most Gracious Majesty's name, the royal gold medal to the man of your choice. He is an architect whose works fully entitle him to receive it, and we may feel the greater pleasure in conferring the honour because the recipient is one of our own body. The Institute has so fully endorsed the recommendation of the Council that it implies a thorough appreciation by the general body of the reasons which led the Council to make that recommendation. I may, therefore, perhaps be thought to be going over ground so well known to the members who are present as to be of the nature of an unnecessary performance in recounting them. As, however, the proceedings of this evening will be reported far and wide, both in our journal and in other publications, it may be desirable to mention some details which cannot but be interesting to outsiders. Mr. James Brooks, on whom Her Majesty this year confers the honour of the royal gold medal, is a native of Berkshire, from the neighbourhood of Wantage. He came to London about 1847 to study for our profession, and became a pupil of the late Lewis Stride, a fellow of this Institute. That he was a diligent worker in the office goes without saying; he also attended Professor Donaldson's classes at University College, and became in due time a student of the Royal Academy, and attended the professional lectures. He commenced practice on his own account about 1852; at first, as was natural, in a comparatively humble way, but soon established for himself the career in which he has been so much distinguished, and in which he has enriched the neighbourhood of London, and also many country districts, with some of the handsomest ecclesiastical structures which have been erected during the last thirty years. A complete list of these buildings would be very extensive, and lead me to a length far beyond what the occasion requires. I therefore select a very few from among the most striking examples, placing them approximately in the order of their dates, namely:—The Convent Schools and Chapel of St. Michael, Shoreditch, 1863; St. Margaret's, Lee, in Kent, 1876; St. Peter's, St. Leonards-on-Sea, 1883; St. Mary, Hornsea, 1888; St. John the Baptist, Kensington, 1892. It is evident that much valuable study and successful practice must have preceded the first during the ten years which date from 1852 as above mentioned. And we may hope that the last named on the list may be succeeded by a goodly following by the same hand. The style of architecture which Mr. Brooks has chosen for the majority of his churches is either the Lancet, or else the Transition into Curvilinear which succeeded it. In a few instances (one of them being the church at Hornsea referred to above) the Perpendicular style has been used very effectively. The treatment is invariably vigorous, and with a simplicity somewhat bordering on severity, particularly as respects the exteriors. This, however, is not the place to criticise but to praise them, and they are worthy of it. Mr. Brooks's fame, no doubt, rests mainly on his ecclesiastical designs; but they are by no means his only achievements. Among his works may be cited a large brewery, an hotel, many secular buildings, two hospitals in connection with sisterhoods, extensive and sumptuous stables built for the Marquis of Londonderry, labourers' cottages and gentlemen's mansions, one of the most remarkable of these being in South Africa. Mr. Brooks is architect to the Diocesan Society of Canterbury, and is one of the consulting architects to the Incorporated Society for Building Churches. Lastly, I feel sure of having your united concurrence with me in the act of handing to our distinguished colleague this royal recognition of his merits as an architect.

The President then conferred on Mr. Brooks the Royal Gold Medal.

Mr. BROOKS, in replying, expressed his gratitude to the President for his kind but too flattering remarks made on himself and his works as an architect, in presenting him with Her Majesty's gift, an honour enhanced in value by its coming to him on the recommendation of his brother architects, members of the Institute. He felt keenly his position that evening. His mind carried him back to the distinguished men in the past who had occupied the same position he then occupied. He remembered quite recently the refined and polished address of Sir Arthur Blomfield, the no less refined address of M. César Daly, the manly address of our American friend and architect, Mr. Hunt, and last but not least Sir Frederic Leighton's learned and comprehensive address. Though he had not the gift of oratory, he felt as deeply as anyone the honour so graciously bestowed upon him. He would prize the medal immensely, and treasure the numbers of con-

gratulatory letters he had received from noblemen, gentlemen, and his brother architects. He imagined most architects had at times felt great depression—at all events he had when he compared his work with those great masters who had left them such great monuments of architectural skill. He had felt it would have been better for history had he chosen a more humble position in life than the masterly calling of an architect. In studying the old cathedrals he had felt what a gulf existed between the works of the old architects and his own work. He attributed many of his own shortcomings to the fact that when he first came to London no systematic training was provided for young men who wished to follow the architect's profession. There was no such practical guidance as was now given by the Institute, where students could carry on their studies and test their knowledge by the process of examination. Of course anyone might pass these examinations, but it would not qualify them to become an architect. It was only a means towards an end. It was necessary for a man to be a born architect in order to succeed in the profession, but the training which that Institute afforded was the means of saving many years in a man's life, and enabling him to get on in a much shorter space of time than was formerly possible. At all times he had tried to do his best, and so long as he was permitted to use his pencil he would try and maintain the position awarded him. This was not the first honour awarded him by the Institute, for all which he tendered his sincere thanks.

The proceedings then terminated about nine o'clock.

COVENTRY MUNICIPAL BUILDINGS.

THE estates committee of the Coventry City Council presented at the meeting on Tuesday the following report, which had been received from Mr. Charles Barry, the assessor appointed to assist the Council in the conduct of the competition for designs for municipal buildings.

The committee inspected the designs submitted, ten in number, and recommended that the premiums be awarded as recommended by the assessor.

Mr. Barry says:—I have carefully inspected the designs sent in, and may preface my report by saying that many of them display much ingenuity in dealing with a very irregular site and with the ancient buildings to be retained, and that consequent on such ingenuity it has been found possible by most of the competitors adequately to provide the accommodation required in the instructions, and which have been satisfactorily complied with generally.

I have selected three designs, and advise the Council to award the premiums to them in the following order:—For the design marked "Leofric the Saxon" the first premium of 150*l.*, for the design marked "Red Crescent" the second premium of 50*l.*, for the design marked "Advance" the third premium of 50*l.*

All the above have been carefully adapted to the area and peculiar shape of the site, and with each design there is a detailed report, dealing carefully with the several points referred to in the instructions, to which I invite the attention of the committee.

No contemplated cost was named in the instructions, and the competitors have treated this question by using various rates per foot cube in making up their estimates.

The authors' estimates of the above three designs are as follows:—Leofric the Saxon, 33,668*l.*; Red Crescent, 33,519*l.*; Advance, 27,891*l.*

The cubes sent in by the authors, as required by the instructions, have been carefully checked, with the following result:—Leofric the Saxon, author's cube, 872,264, cube as checked, 924,681; Red Crescent, 922,700, 948,451; Advance, 979,387, 804,604.

It will be noted that the cubes of the two first designs, as submitted by their authors, are rather understated, though not to a material extent.

The cube submitted by Advance is, however, larger than from the drawings I find it to be.

I think it would not be safe to estimate the new building at a less rate than 10*l.* a cube foot taken all over, but as to this the Council will no doubt be advised by their officer, the city surveyor, who would necessarily have more local experience as to cost of buildings in Coventry than I have. But assuming that a rate of 10*l.* a foot is fairly correct, the probable cost would work out thus: Leofric the Saxon, 37,695*l.*; Red Crescent, 39,519*l.*; Advance, 33,525*l.*

It is right, however, to say that though the design Advance is, in my opinion, good in arrangement and of considerable merit in design, and therefore deserving of a premium, the author has taken, as I think, too small a ratio for the sizes of many of the apartments, and if this design was to be executed I think its cube contents would have to be somewhat enlarged, and its cost would probably then approximate to that of the other two designs I have named.

In order to illustrate this and to enable the Council the more easily to compare the plans, I append a table of certain

particulars of the accommodation provided in each of the three designs, which has been the result of careful examination and comparison.

I have no hesitation, however, in expressing my opinion that the design marked Leofric the Saxon is decidedly the best of all those sent in.

It could be carried out readily in sections as required (see the author's report on this point) with little, if any, derangement of business. The warming and ventilating arrangements have received very careful attention, and in an artistic view this design would harmonise better than most others with the old buildings of St. Mary's Hall, which are in any case to be retained and to form part of the municipal buildings of the future.

Alderman Tomson, in proposing the adoption of the report, said the passing of it would bind the Council to pay the awards in the order in which Mr. Barry recommended them—150*l.* to the first and 50*l.* each to the second and third—and also to employ the successful architect whenever they made any use of the plans for the purpose of building any part of the municipal buildings.

Mr. Drinkwater seconded the adoption of the report.

Mr. Andrews asked how far the committee's report committed the Council to carry out the scheme. The police station comprised about one-half of the whole block. The estimated cost was 38,000*l.* Consequently the police portion would mean an outlay of 19,000*l.*, which, with architects' commission and furnishing, would bring the cost up to something like 25,000*l.*

Alderman Marriott said the question before the Council was that they should pay the premiums.

The report was adopted.

It was then found on opening the sealed envelopes that the plans bearing the motto "Leofric the Saxon" were those of Mr. H. Quick, Coventry; "Red Crescent" those of Mr. H. T. Hair, London; and "Advance" those of Mr. H. W. Chattaway, Coventry.

VERULAMIUM.

AT the last meeting of the St. Albans Architectural and Archaeological Society, Mr. W. Page, F.S.A., read a paper entitled "Notes on the Remains of Verulamium." In the course of it, according to the *Herts Advertiser*, he said he would endeavour to place before them the leading events in the history of Verulamium. It would be remembered, he said, that Britain was invaded by the Romans under Julius Cæsar in B.C. 54, although a landing on the coast had been effected shortly before. The defence of this island was led by Cassivellaunus, Prince of the Cassi tribe, a part of whose territory was the county of Hertford. It was soon found impossible, however, for the ill-disciplined natives to bar the progress of the Roman legions, and having crossed the Thames, as it is said, Cæsar marched upon the principal town of Cassivellaunus, described as surrounded by woods and marshes, and which is by some considered to have been on the site of Verulamium. This he took by storm, but Cassivellaunus continued his resistance till finding all opposition futile, he eventually submitted, and Cæsar having made Britain a tributary of Rome, retired with his army into Gaul. Little is known of Britain or Verulamium for nearly a century. We learn from the researches of Sir John Evans and Mr. Birch that coins of the native prince Tasciovanus were struck at Verulamium shortly after, which clearly shows that the British town of Verulamium was then of some importance, probably the most important of Southern Britain. The country was pretty well under Roman dominion by a little after the middle of the first century. The Roman cruelties towards the conquered inhabitants brought about the revolt of the Icenii tribe under their Queen Boadicea, who, after taking Camulodunum, which had been settled by a company of Roman veterans, took and destroyed Verulamium, which had become a Roman town, and is said to have put to death 70,000 Romans. The insurrection was soon quelled, but not till after much blood had been spilt, if we may judge from the numbers who are stated to have fallen in it. At this destruction of Verulamium probably all remains of the city of the Cassian princes was completely swept away and the entirely Roman city of Verulamium afterwards arose. The Romans remained the rulers of Britain down to A.D. 410, when, after having withdrawn the Roman legions, Honorius sent letters to the cities of Britain recommending them to provide for their own safety. For over 350 years, therefore, Verulamium remained a Roman city. In such a length of time probably all the houses would have been rebuilt several times, especially as in the construction of Roman buildings wood was largely used, but the foundations appear to have been made to last for ever, as it is with the greatest difficulty that the pick can now destroy them, although it is some 1,500 years or more since they were made. After the departure of the Romans Verulamium was taken by the Northmen in A.D. 465 and retaken by Uther Pendragon, and in the sixth century it was finally taken and destroyed by the

Angles. It appears, therefore, that the city was occupied for about 100 years after the Romans left it. The area of Verulamium has been variously stated, but I have worked it out from the ordnance map and find it to contain 188 acres within the walls, not including the foss or fishpool. It is in all probability the largest Roman city in Britain, but the area of some of the Roman cities not having been ascertained, it cannot be said with certainty to be so. Silchester, which was an important city, contains only 100 acres. The walls entirely surrounded the city and can be traced with more or less distinctness on every side except the north, adjoining the fishpool or lake, where, however, the foundations have been discovered at different points. It is possible that as the city was well protected by the fishpool on this side, the walls were not of so substantial a character, and therefore not so capable of resisting the ravages of time and humanity. The foundations shown here by Mr. Grover measured 6 feet wall with 2 feet footing, whereas the wall at Gorham Block is stated by Stukeley to have been 12 feet in thickness. The wall is composed of four layers of Roman bricks, the lowest layer having four courses of bricks, the mortar between them being equal to their thickness; the second layer had three courses of bricks, and the two uppermost layers two courses. Between each of these layers is about 2 feet 8 inches of a sort of concrete composed of large flints and mortar. The Roman bricks vary from $1\frac{1}{2}$ inch to $1\frac{1}{4}$ inch in thickness, and from 12 inches to 18 inches in length and breadth. They are of two kinds, the red of a fine colour and texture, which were probably baked in the sun and called *crudus*, and the others having a red case over a black vitrified substance, which have certainly been burnt in a fire, the black part of which resists a file, and will bear a fine polish. These were called *coctus*. Except on the north side, where was the fishpool, the walls had immediately outside them, as was usual in Roman cities, a foss, about 150 feet across, which, on the south side, is double, and it has been suggested is of ancient British construction. It is difficult now to form an opinion as to the height of the walls; the remains are too incomplete to estimate with any degree of accuracy. The height was not, probably, regular, the walls on the north side were not of equal height to the rest, and the remainder probably differ at various points. There are holes in the wall at St. German's block, which Stukeley says in his time were round, and appears to think the walls were built with them, but from their appearance now it looks rather as though they had been caused by natural decay. Although the walls are now almost the only remains of the Roman city above ground, they have suffered perhaps nearly equally with the remainder of the Roman buildings by the utilitarian hand of mankind. Old Stukeley, in his "Itinerarium Curiosum," published in 1776, says that "three years ago a good part of the wall was standing, but ever since, out of wretched ignorance, even of their own interest, they have been pulling it up all round to the very foundations to mend the highways, and I met hundreds of cartloads of Roman bricks, &c., carrying for that purpose as I rode through the old city, though they have stone cheaper." Although they did not have such a gross tale of vandalism to tell at the present day, yet the older inhabitants tell him (Mr. Page) that there is not half the wall remaining that they can remember, and he dare say many of them had seen the youthful Albanian expending his superfluous energy in the Abbey Woods on a Sunday afternoon in trying to destroy the little that now remains. It certainly seemed a great pity that these intensely interesting remains of the Roman occupation of this country, after braving the elements for over fifteen hundred years, should be allowed to be now ruthlessly and wantonly destroyed. There were four gates to the city, viz. the north, south, east and west. Stukeley also shows a gate at the south-east corner, which he calls the south gate of the city, and Mr. Grover, in his plan, also follows him, but there does not seem to be any reason for or indication of a gate here. On Mr. Grover's plan there is a note that this south gate—he meant the one at the south entrance of the Camlet Way—was visible to the year 1700, and Mr. Ashdown told him (the speaker) that he had found indication of both this and the east gate. The gates were probably protected by towers on each side containing guard-rooms and other accommodation for soldiers. The two principal roads running through the city were Watling Street, which commenced at Rochborough, in Kent, and went through London and entered Verulamium by the east gate and passed out at the west gate and so on through the Midlands to Chester. A line of trees still marks the site of this road through the Roman city. The other road passing through the town is called by Mr. Grover the Camlet Way, which came from Silchester or Calleva, and entered Verulamium at the south gate and passed out on the opposite side, crossed the fish-pond by a bridge or ferry, and probably joined on to what is now called Green Lanes, and so on to Sandridge. The positions of both these roads were identified at the time of the excavations of 1869. The city was traversed like all other Roman cities, according to the discoveries made in the excavations of 1869 by streets running parallel to one another.

Of the buildings of Verulamium, other than the theatre, they knew practically nothing. Whenever excavations have been made, no dimensions or details of the buildings uncovered have been kept, even their positions in many cases can only be guessed. As early as the eleventh century excavations were made by two successive abbots of St. Albans, Ealdred and Eadmer, who, he regretted to say, carried them out with the idea of destroying the then existing remains of Verulamium, rather than preserving them, the reason alleged being that the ruins harboured thieves and other lawless persons. It is said that the subterranean passages and caves, meaning probably the drains and heating chambers of the Roman houses, were filled up, and excavations were made in order to find stone and brick for rebuilding the abbey. It is also related how they came across a palace, in which were discovered a number of books and rolls; these with the exception of one, the life of St. Alban, were committed to the flames as being idolatrous. The one preserved, the credulous Matthew Paris told them, was translated into Latin by order of the abbot, and immediately after crumbled to pieces. They were also told that the ruins of temples and altars were destroyed, showing that at that time the remains of Verulamium above ground must have been pretty extensive. The speaker also referred to the many excavations that had been made on the site of Verulamium, illustrating his remarks by a plan.

EDINBURGH ARCHITECTURAL ASSOCIATION.

THE annual excursion of this Association took place on Saturday last to the Island of Bute. Travelling from the capital via Gourock, Rothesay was reached early in the day. Here the party, which numbered some forty gentlemen, was met by Mr. J. Windsor Stewart, factor to the Marquis of Bute, who accompanied it in the drive to the places of interest visited. Driving across the island to the southern shore, St. Blane's Chapel was first inspected. Mr. R. Rowand Anderson, LL.D., president of the Association, who acted as leader of the party, explained that this ruin, which stands on an eminence near to the shore a few miles to the west of Kilchattan Bay, has been the subject of a good deal of archaeological speculation. A careful examination of the building showed that it was practically of one period, the early Norman. The chapel was believed to have been built about the year 1100, towards the close of the reign of Malcolm Canmore. The only change in the style of the building was a repair to the choir, which probably took place in the thirteenth century. The party then drove to Mountstuart House, the princely mansion of the Marquis of Bute. It will be in the recollection of some that in December 1877, Mountstuart House, built in the early part of the eighteenth century from plans by an architect named Adam, caught fire, and, with the exception of the two wings, was burned down. The work of rebuilding the mansion was begun in 1879 upon plans prepared by Dr. R. Rowand Anderson, architect, Edinburgh. The new building, which is of red Corsehill stone, externally is all but complete. A clock (illuminated by night) and a peal of bells in the central tower are yet to be put in place. Internally there remains much yet to be accomplished, the work there being of an unusually elaborate character. The new building is in style Gothic of the thirteenth century. The wings of the earlier house are preserved and incorporated in the new mansion, the plan of which is a square. The central part of the house, and indeed the main feature of it, is the great hall and staircase, which are both of marble. In height about 60 feet, the hall is vaulted with wood, which is to be richly decorated, while the staircase is vaulted with marble. The main pillars are of green Chippolino or onion-coloured marble; the capitals are white, the bases are composed partly of Emperor's red and dove-coloured marble, and the arches are of Pavouretta marble. The walls are lined with alabaster. Round the hall is an ambulatory, which is repeated on the floor above. The hall is lighted from the top by twelve windows filled by stained glass representing the Zodiac, designed by a London artist, Mr. Lonsdale, the stars, made of thick clear crystal, being mapped out with astronomical accuracy. The window of the great staircase is filled with stained glass, prepared by the same artist, representing the heraldry of the Bute family. The whole length of the principal floor is occupied by drawing-rooms and libraries, a second staircase, also vaulted in marble, giving access to the garden. On the other side of the building the front is almost entirely occupied by the dining-room, service-rooms and entrance vestibule. The upper floor is entirely given up to bedrooms and dressing-rooms arranged in suites, and on the garden front, commanding an extensive view of the firth, to private sitting-rooms for Lord and Lady Bute. Round these are suites of rooms for guests. There is also an extensive nursery wing, with its own hall, stairs and kitchen. The Turkish bath and swimming-pond are in a sufficiently advanced state to add to one's sense of the completeness of the appointments of this princely dwelling. It only remains to be said that the mansion is lighted throughout by electricity, and that

Mountstuart House is a very successful application of Mediæval architecture to a modern domestic building. It should be mentioned that the roofs of several of the rooms are elaborately carved, painted and gilded. On returning to Rothesay the party, together with Provost Milloy, Rothesay, dined together in the Bute Arms Hotel. Dr. Anderson, who presided, proposed the health of Lord Bute, whom he described as one of the most munificent patrons of art in its widest sense. The toast was enthusiastically pledged. Mr. J. Windsor Stewart responded. The chairman then gave the health of Provost Milloy, who briefly replied, after which Mr. Thomas Ross gave the toast of "The Glasgow Architectural Association," to which Mr. William Tait Conner, architect, Glasgow, responded. The party reached Edinburgh early in the evening. Arrangements had been made by the secretary of the Association, Mr. T. Fairbairn, to visit the castle and church of Rothesay, but time did not permit of the programme being in these respects fully carried out.

TESSERÆ.

The Architectural Garden.

IN designing the architectural garden we must derive instruction from the warning of the past. It must not be so vast as to lose the effect of unity of design and to cause satiety. Every part should manifestly have its use. Balustrades should be employed only where some fence is intended or some protection needed. A balustrade drawn across a plane surface, whose inutility is further marked by the absence of gates where it is intersected by the walks, is an offence against common sense. On the other hand, we remember to have seen the portion of a balustrade removed from a position where it was indispensably needed to prevent the careless visitor from falling into the water, and this merely on the ground that it obstructed the view from the windows. No addition of beauty can justify an absurdity. The contrivances for coolness and for warmth, for shelter and for shade, should be exactly suited to the requirements of the climate and the circumstances of the site. In the grouping the masses of the architecture and arranging the lines of the composition, the laws of the picturesque, that is to say, the laws by which the painter regulates his design, will be found the only true guides. To secure the best effect, a due proportion between the house and the garden should be observed. If the garden greatly exceeds the house in taste and in style, it only furnishes a standard whereby to measure the deficiencies of the object to which it should be subservient. If it greatly falls short of the house in massive grandeur and richness of effect, it suggests a painful idea of disproportion and perhaps too of declining taste and diminished means. The fault is by no means uncommon; the terraces and balustrades of the Crystal Palace are crushed by the weight of the superincumbent pile. When the formal garden is added or restored to some stately mansion it seems to be thought enough that the design should be regular and the decorations architectural. It often appears to have been forgotten that the house is to be seen from the garden, and that the garden should not be inferior in boldness and massiveness of design in order that it may form a fitting base on which the house may rest. Even when the general plan and the architectural decorations are all that can be wished, it not unfrequently happens that the details are disfigured with prettinesses greatly below the general conception. When a magnificent platform is to be filled with flower beds the patterns should be large, and the masses of flowers sufficiently important to aid with the richness of their colour the grandeur of the forms. Intricate scrolls and fantastical flourishes (however beautiful on paper) are meagre and confused in such a position, and the multitude of little columnar shrubs with which it is the fashion to stud the surface are mean and shabby if they grow ill, and, if they grow well, in a few years they produce the effect of crowd and confusion; they obstruct the view and throw a shade of gloom where, above all things, the character of lightness and brilliancy is demanded.

Niello Enamels.

A variety of enamelling is that known as niello, the origin of which goes back to the very infancy of art; for Pliny tells us that silver vessels were ornamented by the Egyptians with a black enamel prepared from silver, copper and sulphur. The art appears never to have been lost, as a ring of Bishop Ethelwulf, executed in the ninth century, was ornamented in niello. The Greeks of the Empire, too, must have practised it, and by them it was introduced into Russia as early as the twelfth century, for there exists in the celebrated collection of jewellery in Dresden, known as the Grüne Gewölbe, a drinking vessel in solid gold, which is supposed to have belonged to John Basilides, Grand Duke of Russia, having a Russian inscription executed in niello. About the same period, perhaps,

it found its way into Italy, where it soon partook of the general progress of the arts which was then taking place, and where in the fifteenth century it reached its highest development. Its chief seat was Florence, which produced three celebrated *niellatori*, Matteo Dei, Antonio del Pollajuolo and Mæso Finiguerra. The method of ornamenting in niello was to engrave with the chisel upon plates or vessels of gold, silver or gilded silver, whatever ornament, such as a history, a flower, a portrait or an inscription was required; the hollows thus formed were then filled up, not with an enamel glass, but with a compound of silver, copper, lead and sulphur. This compound when fused was of an intense black colour; hence the name *nigellum* of the ancients, which the Italians converted into *niello*. The effect thus produced was very elegant, though somewhat sombre. During the fifteenth century the sacred vessels used in the churches were profusely adorned in this style, especially the monstrances, chalices, &c.; and it was also applied to the covers of missals and other devotional books, reliquaries, the decoration of household furniture, such as ebony desks, escreteires, &c. (which were usually ornamented with silver plates, upon which were represented histories, flowers, &c., in niello), hilts of daggers and swords, drinking vessels, and indeed almost all silver articles. Niello-work appears also to have been used at one period as characteristic of mourning, as, for example, in the ornamentation of the sacred vessels used in services for the dead and during Lent. Widows who made vows of perpetual widowhood wore ornaments in niello, as we learn in the case of the celebrated Diana of Poitiers. In the sixteenth century the art was neglected in Italy, if we except the labours of Benvenuto Cellini, who was an ardent admirer of and executed a great number of works in it. After him the application of niello fell into complete disuse in all Western and Southern Europe, and was only revived about twenty-five years ago. This was not the case, however, in Russia, where it has been regularly practised, under the name of the "black art," since its first introduction into the country.

Fuseli's Imaginative Figures.

The importance of the constant observation of nature to the painter of real life will be readily admitted, but such habits are of no less value to the painter of the most imaginative class of subjects. The supernatural is not the unnatural. The centaur, the sphinx, the satyr, &c., are but combinations of nature, and there is true taste shown in making these ideal beings act naturally, as when, in a group of the Phygalian Marbles, a centaur bites his antagonist, and when Shakespeare makes Bottom the weaver long for hay and oats when the ass's head is on his shoulders. Indeed, two of the most exquisitely poetic conceptions of Shakespeare, the Oberon and Titania, when we look beyond the charm of their language, are the veriest man and wife that ever existed, and are the better for it. The ghosts and witches of Fuseli may be called natural, inasmuch as they are exactly what it is natural to the imagination to conceive of such things. It would indeed require the eloquence of Fuseli himself to do justice to some of his conceptions of the visionary; the ghost of Hamlet's father, for instance, or the weird sisters vanishing from the sight of Macbeth. Perhaps the finest of all the works of this extraordinary man is the "Sin and Death;" and in this he has done that which, had he not done it, we might have thought impossible—he has embodied Milton's words, "What seemed his head the likeness of a kingly crown had on." In the "Satan" of Sir Thomas Lawrence all is so material as to be wholly unnatural with reference to the subject. The body and limbs of the fiend are as solid as the shaft of the spear he holds; and the helmet, sword and shield seem painted from objects borrowed from the property-room of a theatre. In the "Sin and Death" of Fuseli there are a ponderous key (the key of the gates of hell) and a chain. But they are forged by no earthly smith, and are not otherwise thought of by the spectator than as parts of a terrible vision. Indeed few painters have given an equal degree of terror to such subjects; and in spite of occasional extravagance, not seldom indeed bordering on the ludicrous, Fuseli was a great genius, a genius of whom the age was not worthy. He was profoundly acquainted with all in nature that could help his conceptions of the visionary. He was a perfect master of chiaroscuro and of the evanescence of colour, neither of which are in any respect inventions of art. He had also acquired so competent a knowledge of the anatomical structure of the human figure as to be able to give ideal probability to attitudes in which it was impossible he could be helped by living models. Hence he could also give to his ghosts that general and uncertain look that belongs to shadowy beings, without the omission of the leading characteristics of form, and his breadth, to borrow an expression of his own, is never "emptiness." Fuseli, therefore, was as much indebted to the knowledge of nature for his power in the visionary as to his imagination; and it was in a great measure the want of such knowledge that rendered the art of Blake abortive.

NOTES AND COMMENTS.

It has been recommended by the Commission appointed to organise the annual fêtes at Orange that 1895 should be allowed to pass without the usual representations. The old Roman theatre requires reparations which cannot be delayed. The masonry of the steps or benches is becoming ruinous, and any use of them would involve additional expenses in restoration. It is also necessary to construct an immense *velum*. Ladies are not sufficiently enthusiastic to witness a spectacle in torrents of rain, and if they depart it will not be alone. The postponement of the theatrical performances may therefore be taken as certain. It is curious that one of the plays suggested for representation should be VICTOR HUGO'S "Cromwell"—a work which is never to be witnessed on any of the Paris stages.

WITH all its faults the Municipal Council of Paris is not neglectful of art. This year examples amounting to 74,600 francs—or, say, 3,000*l.*—have been purchased, that is, the Salon was patronised to the extent of 46,500 francs, and the younger exhibition in the Champs de Mars 28,100 francs. Out of the latter sum 17,800 francs were expended on four *objets d'art*, viz. a dining-room service, a "fontaine-lavabo," a decorative medallion and a plateau in bronze. Three paintings cost 8,000 francs, a water-colour 1,500 francs, and two sets of drawings 800 francs. At the Salon 22,500 francs were laid out on seven paintings varying in price from 1,500 francs to 8,000 francs, and 24,000 francs on five pieces of sculpture, the prices ranging from 3,500 francs to 8,000 francs. It may be said that 3,000*l.* is not a large sum to represent the official patronage of the capital of art, but it should be remembered that much money is being paid to artists for the decoration of the Hôtel de Ville, and moreover the Municipal Council is under an obligation to contribute largely this year towards the expenses of the International Exhibition of 1900. Many years, we fear, are likely to elapse before the Corporation of London or the County Council will be incited to expend 3,000*l.* on pictures in the summer exhibitions.

THE lantern of St. Nicholas Church (now used as the cathedral), Newcastle-on-Tyne, is so excellent an example of the coronal type of tower completion, its preservation has interest for all who care for English Gothic. It is now in so dangerous a condition the ringing of the bells is prohibited until the necessary works are executed. They will cost from 1,700*l.* to 1,800*l.* In most cases the cathedral authorities would undertake the restoration. In Newcastle, however, the Corporation will have to find the money. This does not arise from any local disestablishment Act, or from the right of possession, as is the case in Scottish towns. The only ground for liability apparent is that on some former occasions the Corporation, in a benevolent mood, paid for reparation, and when a financial precedent is once established it is not easily set aside. That the claim is not well established is evident when it is found that the Corporation is without any representation in the cathedral body. The only consolation for the ratepayers is that the lantern is an ornament to their city such as few towns possess, and that its destruction would be a calamity.

AN arbitrator cannot be too circumspect in referring to a case with which he has to deal. Sir ALEXANDER RENDEL, the engineer whose name is associated with so many large engineering works in India and elsewhere, was appointed arbitrator in an action brought by a firm of contractors against the Leith Dock Commissions. He happened to say at a dinner party as far back as February 1894 that the contractors ought to have a larger sum than 2,500*l.* which was offered by the commissioners. His words were reported to the latter, and when Sir ALEXANDER RENDEL gave his award an effort was made to set it aside. It was alleged that Sir ALEXANDER RENDEL was not an impartial judge, having previously expressed an opinion favourable to the contractors in circumstances which rendered it impossible for him to give thereafter an impartial award, and that the fact of his expression of an opinion unfavourable to them was concealed from the Commissioners. Lord Low, the judge who heard the case, said it appeared to him that the opinion expressed by the arbitrator, under the circumstances in which it was expressed, had no tendency to bias

his judgment or to make it difficult for him to say that nothing should be paid to the contractors, if that should be his opinion after hearing evidence. His lordship was of opinion there was no concealment, and accordingly judgment was given for the contractors.

AN index is more indispensable in an encyclopædia than in any other literary work, unless the alphabetical arrangement is carried out to an extent that becomes embarrassing and repetitions are adopted without limit. When, as in the case of the excellent "Encyclopédie de l'Architecture et de la Construction," edited by M. PLANAT, the majority of the articles are complete treatises which could be brought out as independent volumes, the need of an index becomes still more evident. The "Tables du Texte et des Dessins," just issued by the publishers, MM. AULANIER & CIE., will be a boon to all students of the six massive volumes of the Encyclopédie. No description could so well suggest the variety of information which M. PLANAT succeeded in amassing in his Encyclopédie as a glance through the pages of the index. It will enable readers to make an exhaustive study of architectural subjects. Let us suppose English architecture is taken up. In the first volume is a general study; the Roman, Gothic, Renaissance and Modern periods are elsewhere specially treated. Examples of buildings, not only in London, but in provincial towns and villages, are described and illustrated, and can be referred to without delay. As every class of modern building is described, such as banks, residences, theatres, circuses, baths, schools, warehouses, clubs, churches, a clue is afforded to practice in many countries which will often afford to the architect suggestions which he seeks. Take the case of libraries. We find illustrations and descriptions of examples in Berlin, Munich, Stuttgart, Wolfenbuttel, Birmingham, London, Vienna, Boston, Washington, Reims, Bordeaux, Grenoble, Paris, Toulon, Siena, Leyden, Coimbra. It would be strange if among so many there were none which could afford hints for new libraries. Details are likewise discussed separately, and a reader can judge of ancient and modern practice, of local varieties as well as generally approved forms. The index is arranged in a manner which facilitates reference, and it will increase the value of a work in which the architecture of all times and countries is presented by competent authorities.

THE *Standard's* Athens correspondent telegraphs that the Archaeological Society of the Greek capital have decided shortly to take in hand the repairs required to prevent the Parthenon from falling into a more dangerous and ruinous condition than it is in at present. The repairs are to be carried out on the lines suggested by Professor DURM, who, after a careful and minute inspection of the structure, drew up a report on the subject. A commission of architects has been appointed to superintend the work of reparation. Mr. F. C. PENROSE, Professor DURM, and the French archaeologist, M. MAGNE, have been requested to give their views and advice on the details of the proposed repairs.

THE Guide to "the Monastic Church of Lestingham," by Mr. CHARLES WALL (C. TAYLOR) is a model of a guide book on account of its handiness, clearness and accuracy. The Church of the North Riding village was founded in the seventh century, and the choice of site was enough to indicate that St. CEDD, the brother of the more famous St. CHAD, was a model monk in his love of the picturesque. Apparently no part of the existing church is older than the eleventh century. In the early part of the century many alterations were made under the direction of JOHN JACKSON, R.A., the portraitist, who was a native of Lestingham. He painted a copy of CORREGGIO'S *Agony in the Garden*, which he presented to the church, and had the chancel altered for its better exhibition. Mr. WALL says:—"This was a most lamentable instance of dishonouring God for the glorification of an individual; the gift was quite worthy of a place in God's house, but to enhance the beauty of the picture the whole idea of a church for sacramental worship was ignored, and to elevate the art of painting the sister art of architecture was debased." The authorities who granted the faculty were no less to be blamed. The old church is most interesting, but it is little known, and Mr. WALL'S guide-book may induce many tourists to visit it.



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S, VICTORIA EMBANKMENT.
NER, Architects.

Die Architektur, June 28th 1895.





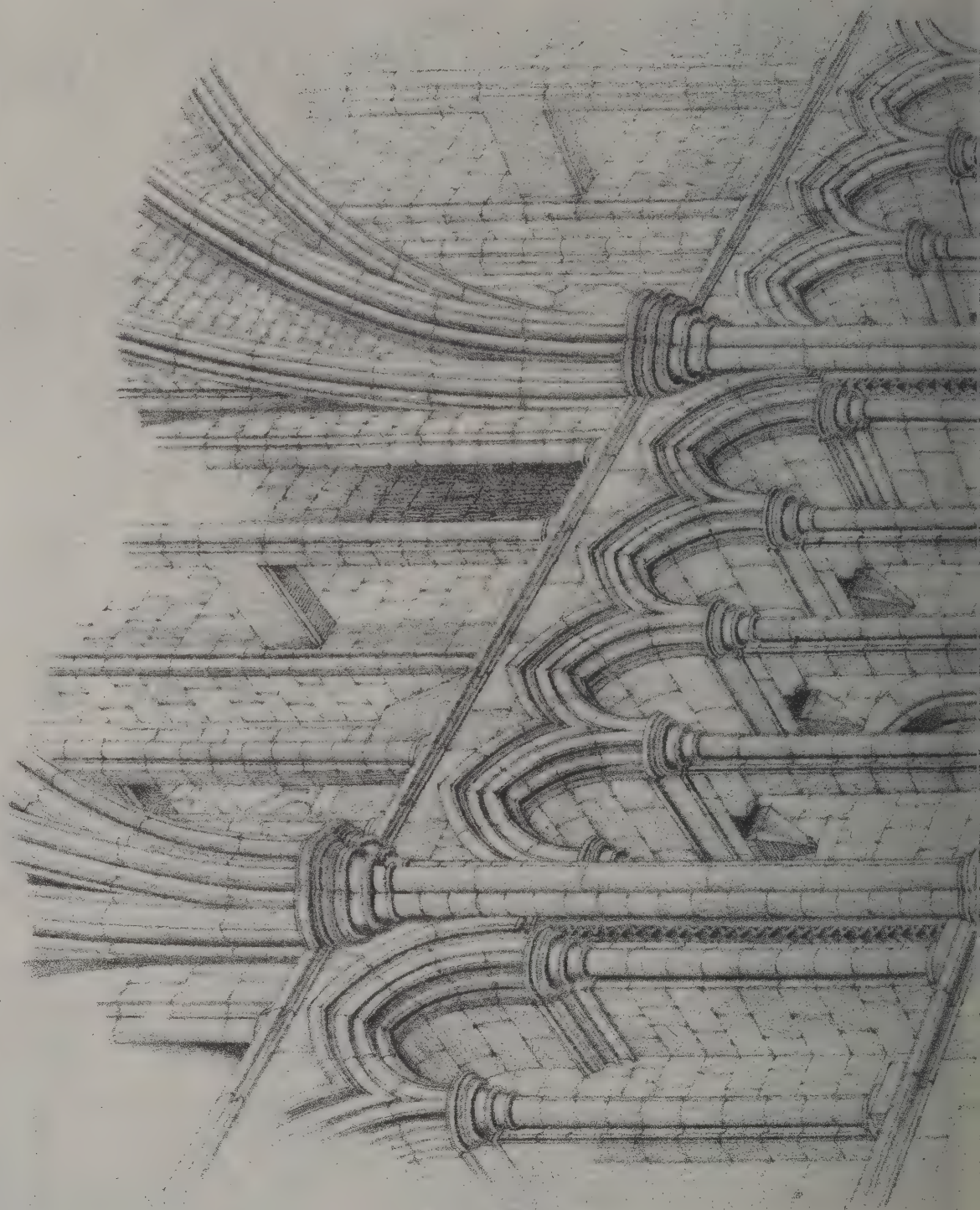
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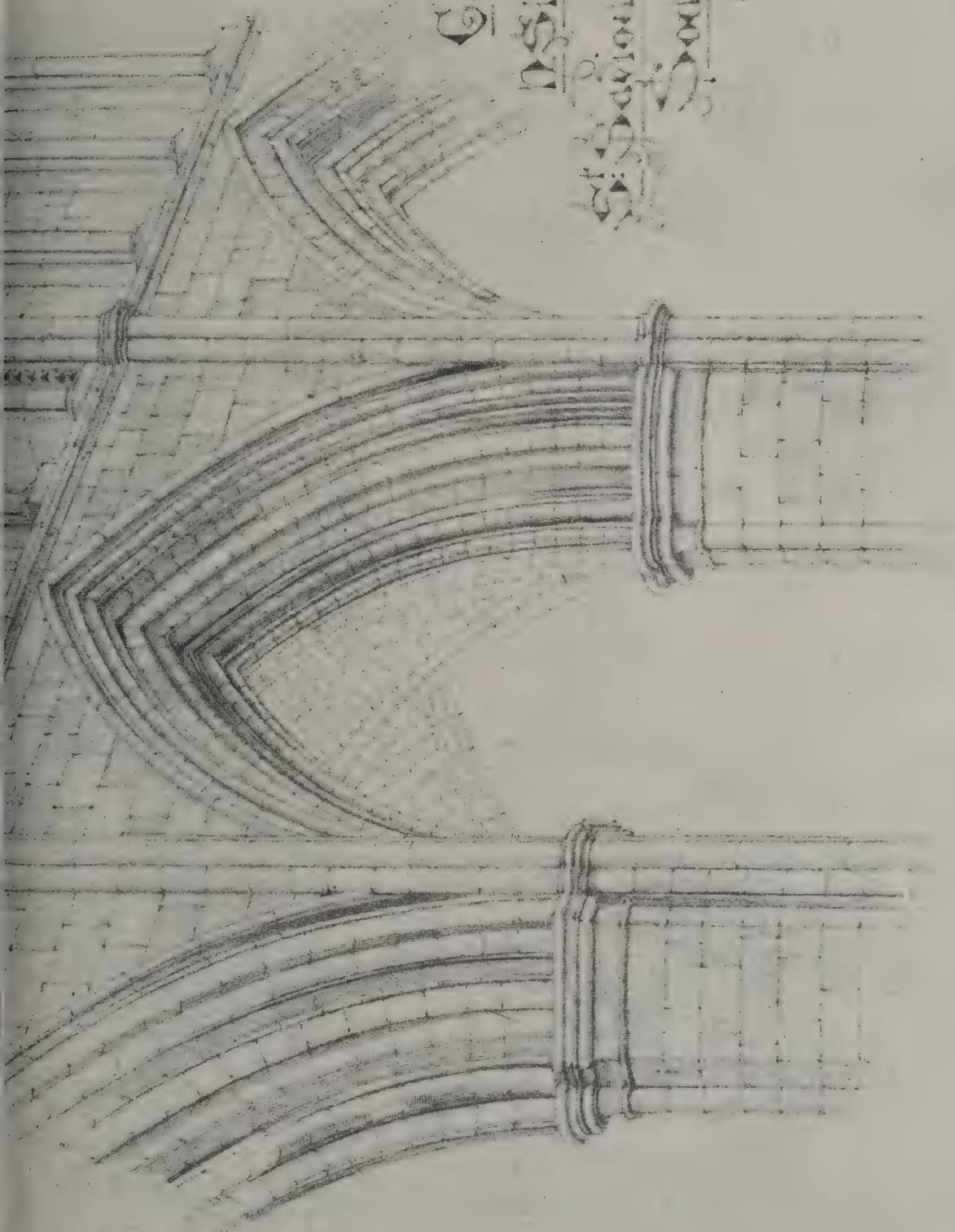
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EXTERIOR: JUNIOR CONSTITUTIONAL CLUB, PICCADILLY.

R. W. EDIS, F.S.A., Architect.

The Architect, June 28th 1895.





Central Bay
N Side of Choir
Transepts Choir
South Transept

FREDERICK CHATTERTON
JUNE 1894

ILLUSTRATIONS.

LONDON SCHOOL BOARD OFFICES, VICTORIA EMBANKMENT.

EXTERIOR, JUNIOR CONSTITUTIONAL CLUB, PICCADILLY.

CENTRAL BAY, NORTH SIDE OF CHOIR, ST. SAVIOUR'S CHURCH, SOUTHWARK.

THE DECORATION OF ST. PAUL'S.*

WHEN I was asked to read a paper before the Society of Arts upon mosaic, my first inclination was to decline to do so, because, like all other arts, the art of mosaic is involved with technicalities which, to a mixed audience, can claim but very limited interest. Upon second thoughts, however, it occurred to me that it would be wise to set aside all doubts as to the interest or the reverse of the subject of my discourse, and to remember only the object of it—a noble one at least—the decoration of our great metropolitan church of St. Paul.

It will be needless for me to enter into an historical treatise upon mosaic, though I shall have to say something about its growth and decline, because books provide such information, and, moreover, the historical side of the question was very fully set before us not long ago from this desk.

It is left, then, for me, with as little egotism as possible, to set before you the history of my experience, which has by this time become very considerable in a difficult and beautiful art, which the longer I study the more enchanting I find its possibilities and the more ennobling its limitations and restrictions.

It will be impossible to avoid technicalities, which will only commend themselves to experts; they are of necessity dull matter, excepting to those who are more or less craftsmen.

It must be remembered that an artist speaks to you primarily and almost entirely through his special language of form and colour; his pen may be a useful adjunct, but it will never instil a comprehension of the language of æsthetics unless the artistic sense is already present in the minds of his audience. Colour and form can no more be described in words than notes of music. If eloquence and a mastery of language could have succeeded in making English people an artistic nation, the writings of John Ruskin would have done so years ago. We are in this latter half of the nineteenth century in a desperate hurry; life is so complicated, so full, so strenuous, and leisure is so rare, that the arts of peace, which demand quiet and study, have but a slender chance of assuming that importance in our lives which they undoubtedly assumed in simpler and less distracted civilisations. We are to a certain extent the slaves of fashion, ever shifting, every changing with a rapidity truly appalling, by which restlessness art must suffer more or less, and especially that form of it which is known by the title "monumental."

Monumental art claims no fashion; it is not the result of a moment's exhilaration, it is not the mark of a clique, nor is it the common property of the sale-room; it is essentially non-commercial. To induce a taste for monumental art in England, excepting in a very spasmodic fashion, has always proved to be difficult, indeed it would appear to be wellnigh impossible. It was difficult a century ago, when James Barry painted these walls whilst he lived mainly upon bread and apples, and Sir Joshua Reynolds was filling the learned with amazement by his profound discourses upon "the grand style" and his eloquent eulogiums upon that greatest of all modern artists, Michael Angelo. The art of Fuseli, Barry, Haydon and other enthusiasts left but little mark upon the buildings of England. Tom Thumb, the famous dwarf, attracted crowds, while the collection of pictures by Haydon was visited by ones and twos. The particular constitution of the English mind is practical; its predilections are more Roman than Greek; it is more sensible than poetical, more commercial than imaginative.

The Reformation set a-blaste whole piles of prejudices: the dread of idolatry, the fear lest matter should be worshipped in place of spirit, strangled every artistic effort in the direction of church decoration. Such violent feelings were national, so that when the Bishop of London was approached in regard to the decoration of St. Paul's a century ago, he not only spoke his own feelings, but probably he expressed also the feelings of the majority when he made answer to a deputation, "that nothing would induce him to sanction the conversion of Protestant St. Paul's into a Popish church."

So the "grand style" of Reynolds, Barry, Fuseli and other considerable artists never came off. Hence our cathedral remained an example of the dulness of Protestantism, an evidence that England was not ready to remarry religion and

art, which since the sixteenth century had been divorced, to the serious detriment of one as of the other.

Time has, however, wrought change in the aspect with which such matters are regarded. The Oxford movement, greater facilities of travel, and a generally broader and healthier view of religion, and its consequent emancipation from many narrow crudities, have one and all conduced towards a possibility of that reunion of religion and art which cannot fail to promote vitality and reality to both causes.

So when the atmosphere of thought was cleared of prejudice and narrowness, it got into the air that St. Paul's Cathedral could not be allowed any longer to remain a standing protest against progress, whilst even the Nonconformists were finding that they must travel a bit with the times, and shed some of the dull feathers of their mournful plumage, and break into song accompanied even by that dreadful instrument, the "devil's box of whistles." And so it came to be again seriously considered that St. Paul's should be decorated in an appropriate manner in accordance with the wish of Sir Christopher Wren, and this time there was no veto put upon the enterprise by a narrow-minded prelate.

Once more that precious votive offering of man's highest intelligence, and his power to create and to dedicate his gifts to God's house, were to be offered in an Anglican cathedral, and which had been for three centuries almost wholly absorbed by that branch of the Christian church belonging to Rome.

That great artist, Alfred Stevens, whose monument to Wellington is worthy of the great general, as it is worthy of this nation, made designs for some of those spaces known as the spandrels below the great dome of St. Paul's.

Another great artist, happily still with us in the possession of his great faculties at an advanced age, George Frederick Watts, designed for two of the spandrels. We now see the result in mosaics executed by Dr. Salviati, of Venice.

Various experiments were tried for the decoration of the choir and the great dome, which, for one reason or another, failed to receive a cordial recognition, notwithstanding the marked ability of Sir Frederic Leighton's and Mr. Poynter's designs, and for a time matters came to a standstill.

The reredos, erected from Messrs. Bodley & Garner's design, demonstrated the absolute necessity for proceeding with the decoration; and it was through Mr. Bodley's advice that I had the honour of being called in to render my assistance. And let me here take this opportunity to express my gratitude to my friend, Mr. Bodley, for his having been the first cause which brought to me a labour that has been, is, and will be, I trust, for some years to come, fraught with the highest pleasure and deepest satisfaction, which entirely outweigh the anxieties and responsibilities of my work. And this is a fitting time and opportunity for me to record my everlasting obligation to the distinguished Dean who has so kindly taken the chair this evening, and to his colleagues for their touchingly loyal confidence granted to me by one and all of them.

In an undertaking so difficult and so full of possible pitfalls I must here affirm that it would have been impossible for me to have carried out my work as far as I have done with a comparative sense of ease had not I felt at every turn, and under every difficulty, that I was envired by an atmosphere of sympathy and perfect confidence, which increased my energy and desire to worthily carry out the wishes of my friends. I question if in the whole history of art any man has been so happily circumstanced as I have been, or ever worked under conditions more favourable to himself.

One more pleasant recognition before I start upon the egotistic track. My thanks are due to Mr. Harry Powell for his unremitting labour to give me what I wanted in the glass tesserae, as well as in the glass for such windows as I have designed and executed for St. Paul's.

I venture to think that in all respects the materials supplied by Messrs. Powell for my work are first-rate—equal, indeed, to any which were supplied to the mosaic artists of the best periods, Greek or Italian.

To my workmen, whom I regard as brother artists, both those who assist me in my studio as well as those who work so carefully and so steadily in the cathedral, I tender my heartfelt thanks. Instead of increasing my difficulties, one and all of my co-workers have aided me unselfishly and kindly.

When the Dean and Chapter desired me to submit designs for the decoration of the choir, I was fully determined upon certain points. That the only material for such decoration was mosaic, because it can be washed without injury, an absolutely necessary precaution under the condition of London smoke-laden atmosphere. However delightful may be the methods of fresco and tempera painting in the clear air of Italy, or even in country places in England, while London air continues to be charged with every destructive acid, they are out of the question there. And, further, the advantage of mosaic over all other material for decoration lies in the free use of gold and silver which is demanded by the nature of the design that is applicable to the material.

Against pictorial mosaic I resolved to set my face, and to

* A paper read by Mr. W. B. Richmond, A.R.A., before the Applied Art Section of the Society of Arts on May 28.

adhere to the principles of design and execution which prevailed in Italy, Greece and Asia Minor during the classical times of the Byzantine Empire. And while adhering in principle to severe methods of design and simplicity of colouring, to accept and make use of the modern spirit of antiquarian research I determined to follow the precepts of the great masters, by being accurate in drawing and, according to my lights, noble in my choice of form.

But perhaps my most important point, as it appeared to me to be, was that our Metropolitan Church must be decorated by English and not by Italian labour. I am bound to say that if England found herself unable to provide genius and talent for the adornment of her great church, better that it were left alone, to prove once more that we are not an artistic people, but only a race of shopkeepers.

As far as my workmen are concerned, the aphorism of Napoleon has been contradicted. Quite leaving out any estimate of the qualities of my design from the question, of which I am no judge, in fairness it can be said that the mosaic work in St. Paul's, laid by English workmen, the materials for it made in England, proves that, however rash it might have appeared to be at first sight to employ them, there need be nothing but congratulation as regards the choice.

The workmen under me have proved themselves able to compete with and beat their co-workers upon the continent, a matter of the utmost importance at a time fraught with commercial difficulties and stagnation in the labour market.

Another point upon which some determination upon my part had to be exercised. Whether from false ideas of economy or, what is more likely, a certain listlessness, modern mosaic workers have thrown aside the well-tried principles of mosaic manipulation, substituting a method illegitimate, lifeless and unreal. I allude to the practice of fixing the cubes by means of gum upon canvas away in a workshop, far removed from the building that is to receive them.

That process I will not waste my time in describing. Yet, broadly speaking, one aphorism that applies to all decorative art may be permitted me. "Just as a building is erected where it is to stand, so every portion of the decoration of that building, wherever it has relationship to the walls or to the structure, should be executed where it is to remain, in the light and under the conditions of its environment."

If one lesson can be learned which is absolutely sustained throughout the churches of Italy, it is the important fact that an harmonious spirit seems to pervade these churches of every century's labour, even to the seventeenth century; because what we see there, from Lombardy to Naples, are conceptions, conceived as a whole, executed as a whole, and perhaps carried out unconsciously harmoniously with their surroundings; because they were carried out *in situ*, under the ruling of the dominating influence of architecture.

This being duly considered, I had to look around. It was not unnatural that my first thoughts should travel in the direction of Whitefriars Glass Works, where the Powells have been labouring to improve the manufacture of ornamental glass for more than a century. And I was rewarded.

Mr. Harry Powell, as I have said, took infinite pains to supply me with tesserae as good in colour as any I have seen; indeed, upon placing them side by side with cubes of Greek and Italian manufacture of the best period of the mosaic art, I am bound to say that they were hardly distinguishable one from the other, either in quality of material or in brilliancy of colour.

To start with, I thought a palette of thirty colours, or rather shades of colour, was sufficient, and there I was right; that number is much more than sufficient. As my experience increases eight or ten tones of colour are ample if used with art and knowledge as to their relative action. And this limitation of the number of colours is one of the great powers of mosaic, which I will later on briefly explain.

Well, if we were to recede from modern technique and re-adopt the old style, how were we to proceed? You know that there are two cements, water and mastic, in which the cubes are inserted. It is beside our intention this evening to follow to earth every detail of my great enterprise; suffice it to say that, after many experiments, I found a mastic cement answering in every detail to a cement employed in the fourteenth century in the restoration of Andrea Tafi's mosaics upon the dome of the baptistry at Florence. Its advantages are many; it does not dry too rapidly, and it retains a certain modicum of elasticity for a long period.

Those members of the public who have so generously opened their purses for the decoration of their cathedral need not fear that time will prove cruel towards the object of their donations. My cement in time becomes so hard, and the cubes are so firmly embedded with it, that it may in time be said to be like stone. Thus one very grave difficulty was with patience surmounted.

Now came the testing-point of my rash promise to obtain English workmen. Again I applied to Mr. Powell. Two of his young men had already executed a mosaic panel, after a design of Mr. Holman Hunt's. But as their work had been entirely

the modern picture mosaic, executed with thin plates of glass in place of cubes, the method which I had determined to employ was to them an entirely new one.

Now, at the outset of my work—seeing that I was to initiate the recovery of a lost art—much as I desired at once to work upon the wall of the church, upon consideration it appeared to me important that the initiative should be made as easy and convenient as possible, seeing what the difficulties of the problems before us must of necessity be. Therefore I built in my garden a shed and a studio, the one for my use, the other for the use of the mosaic workers, who, as time went on, gathered strength in numbers recruited from various sources, till we finally for the moment reached nine workers, and here we worked for four months.

If we were not yet to work upon the wall, what were to do? I had large slabs of slate cut, well scored with diamond shapes, so that the intonaco to be laid upon them would find a grip; and upon these slabs were executed the first two spandrel mosaics, those which you can see upon the north side of the sanctuary above the arch between the cornice and the capitals. But I must go back a moment. The sketches prepared upon a small scale, the full-sized cartoons, were executed. I chose to make my first essays upon the parts of the church lying midway between the vault and the floor, so that they might offer me a fair chance of trying the strengths of light and dark at a comparatively speaking moderate altitude. Thus, I should have a guide for future work by which I could reason what strength would be required at a greater height. These cartoons I made in charcoal for the following reasons:—I wished not to compromise myself with elaborate colouring at the outset, for I feared that my practice as a painter might lead me, however carefully I guarded against it, to disregard the peculiar nature of the material I had to use; also it would enforce my being present during the whole proceedings, and oblige me to overlook every bit of work, and in point of fact to do a great deal of it with my own hands; this I did, not only executing a considerable portion, but also learning how to cut up the material so that I might prove to my own satisfaction what could and could not be done in shaping the cubes. I believe in only four shapes as the result of this experience, namely, the cube, the double cube, the equilateral triangle, and elongated cut forms finishing in sharp points. In order to be exact in the shape of the slabs which had ultimately to be fitted together and to make a perfect joint when fixed, I cut my cartoons up into the necessary number of shapes of such a size that each shape could be given to one or two men to work upon.

I made a rule to begin with the outlines, whether in the flesh or the drapery, of working from the shadow, through the half-tint, and so up to the light. A difficulty sometimes occurred in that, as the space became filled up, the cement overlapped and pushed the outlines out of shape; this difficulty was easily met by pressure from the outside of the outlines until they assumed their proper curves. It was no small difficulty at first to persuade my workmen to leave a good margin of cement showing between one cube and another, naturally, for the three of my workmen who had had some experience in paper mosaic, two having worked with Messrs. Powell and one with Salviati, had acquired that evil habit of jamming the cubes closely side by side, thereby quite ruining the legitimate effects of signs of building, so important to mosaic as to architecture, and making, instead of structural design, an indifferent imitation of a picture. I endeavoured to beat into their brains the fact that the worst mosaic is most like a picture, and the best mosaic has all the structural qualities belonging to architecture—the one entirely out of place in a building, while the other seems to grow naturally out of architectural forms. After a time I found my men taking a keen interest in the work—intelligently—proving, after all, that Englishmen only need to have sound principles taught them, and insisted upon, to render them as serviceable craftsmen as the world can now produce. Upon more than one occasion they have said to me that they no longer felt mosaic work to be monotonous, mechanical and uninteresting; whereas under the system of cutting the thin slabs of the flash mosaic of Messrs. Powell's into complicated shapes—more complicated than geographical puzzles which we used to put together as children—they wearied of it. I made it a rule never to leave my men in doubt as to my meaning. When I criticised, no work was taken out to be re-done without careful explanation why it was done. I drew diagrams to show what I meant as to the simple principles of building the cubes, worked with them, raised the enthusiasm of those who were to be my prime helpers in a most difficult and responsible work.

For more than three—nearer four—months day by day we worked together. At the end of that time I am bound to say that I was much wiser than at the beginning, and I venture to think that all the anger which had exploded and the labour expended during that period were not in vain. I had got my staff into good working trim, as I believe anybody could do, if they would never trust to a middle man, that most fatal invention of modern commerce and successful destroyer of enthu-

siasm, and consequently of life in work and everything that makes art in immediate touch with our most delicate sympathies. Until that incubus is got rid of, and architects as well as decorators limit themselves mercifully to what they can personally oversee, delegating nothing to a subordinate, and are day by day in immediate relation to their craftsmen, there is nothing to expect for the future but death and sterility for art. At last the two spandrels were completed and carted away to be put up in their place. The wall to receive them was cut back, and the slabs were fixed with bronze screws into leaden sockets inserted into the stone, being bound to the wall with red lead.

And now, with regard to these two spandrels, permit me to be at once frank and brief. I did not use sufficient strength in my outlines—I used my white too liberally—the consequence being that the half-tones are too narrow, on account of the liberal expansion of white. I erred upon the side of light, and neglected broad shades. I hope, however, to have this put right by-and-by, and I feel sure that the same faults have not again been committed. In the meantime, my men being in full working trim, I resolved to attack the small easternmost dome. This dome, saucer-shaped, happily obliged us to begin to work upon the wall at once, and I thought it a good opportunity to put my men into a position of responsibility, as they had just come out of a severe and personal training.

It was not without some difficulty that I persuaded Messrs. Powell, who had never executed anything in mosaic directly upon a wall, that the principle of paper mosaic was not the best and the cheapest: they imagined that their system was quicker, and therefore more profitable. I, on the contrary, held the opinion that upon the economical question they were wrong, and that I was right; but in order to prove my point I had an eagle worked upon their principle. They were convinced, not only upon the important point of economy, but, secondarily, upon the result. My principle took about half the time, and was infinitely more satisfactory when done; indeed, the man who, after having worked with me, lamented that he should have been employed again to go through the deadening drudgery of the modern system.

It is wonderful how quickly the modern mind is accessible to art when it has once grasped the fact of its relation to profit, but you must indelibly prove the profit before the artistic sense is touched. Whatever may be the results of my work, *qua* design, that I have nothing to do with. I am willing to wait a century for an estimation of its value; but one thing I trust to have done, I trust I have, for ever killed paper mosaic in England, for financial as well as artistic reasons. I hope to have re-established the old plan, which is quicker, cheaper and better than the new; it leads to finer work; it is more certain in its results; it is legitimate in principle, and first and foremost it is infinitely more amusing to the workman, for it stands to reason, if the workman is not amused by his work, it will be lifeless, inarticulate and dead. Drudgery we all have to pass through, but the drudgery that is slavish and leaves nothing for spontaneous expression, and which makes the workman into a shackled slave, can be no more humanising to him than it can be interesting or touching to the minds of those who review its results.

I have been very careful to retain work which, while it did not come up to my standard of completeness, displayed at the same time a vitality and character which I should have been very sorry to lose. Uniformity of execution of such great magnitude would end in dullness without variety of execution, and the faults of its merits that help to give it life.

No better illustration can I think of than the frieze of the Parthenon, evidently the work of one designer, though executed by several different hands. One recognises the failure of expression here and there among the triumphs of perfect successes—the halting incompleteness by the side of gem-like finish. We feel the pulse of the workman in the touch of failure, and the work is human; the shadow, as well as the light of the human mind, is there: our sympathies are aroused for the duplex nature of man. A dead level of perfection, a cold accuracy of science, and a perfection to be reached only in such a small thing as a Greek gem, would be quite insufferable when exhibited upon an enormous scale, which naturally demands the exhibition of many and very various phases of thought.

For four months we worked upon the dome. Before commencing the mosaic I offered up my charcoal design. Afterwards I coloured it, and again offered up a portion of the coloured cartoon. The first was with the object of ascertaining the strength of outline, the second the strength of colour. As I see my work now completed in mosaics I see reasons for certain regrets. My cartoons having been executed in pastel did not receive any reflection upon their surfaces from the nature of the material adopted. The mosaic, however, does receive reflection. The lesson I learnt here was to make my outlines and masses far more distinct in the cartoon than I intend them to appear when transposed to another and reflecting medium, because the reflecting surface eats into all the dark

surfaces. I also made too many details; in point of fact, in a sense, I put in more work than was really needed. Upon the other hand, one must remember (to compare great things with small) that Phidias completed every figure upon the pediment of the Parthenon *ad unguem*. Some of the most delicious portions of the work were for ever hidden from view from the time they left the workshop of Phidias to the time when they were taken down by Lord Elgin. This, to the commercial mind, is labour thrown away, but to the dedicatory spirit of the great Greek artist, his labours meant religious offering to the virgin goddess; his sacrifice through his art was to her, he gave her his best, his truest and noblest self, disregarding the labour he expended he disregarded applause or blame. Sentiment apart, it is my firm conviction that the influence of delicate details, even upon a height, is never wholly lost, it gives a play of colour, a mystery, and an interest which breadth alone cannot achieve; it is possible to overdo detail, but it is far worse to underdo it. To overdo breadth, ends in baldness, a far greater sin, to my thinking, than an excess in the other direction.

Every portion of a building requires a different treatment, owing, of course, to the manifold effects of light to which surfaces are subjected. In the case of the dome it was desirable to heighten it in effect, rather than to lower it. A dome we can hardly call it, in that its elevation, at the apex of the curve, is not more than 3 feet, so that in point of fact it is more like an inverted saucer than a cup.

As soon as the plaster was stripped and revealed the extremely beautiful brick face—better brick building I have never seen—I at once became aware of the heightened appearance which the concentric circles of the white mortar lines between the courses of bricks gave. Oddly enough I had already designed for the dome upon such principles of concentrating circles—to my mind a far finer treatment of a domical surface than by breaking it up in ribs. Fearing that I might miss my intention to add rather than to diminish height, the outline of my forms I kept thin, not more than a quarter or an eighth in width, and I made use of brown instead of black. Upon all the interior forms of birds and trees, I permitted myself neither brown nor black, and kept all the drawing of the wings, feathers, &c., very bright in colour, making use of red, amber, green, blue, grey, both warm and cool, and the high lights of white or a pale lemon yellow. In many instances, notably in the birds which I wanted to appear whitish, I outlined the more delicate parts of their plumage with silver, so that those outlines, when the silver was not shining, might appear to be dark and light off the white when the silver shone. In the leaves of all the trees I drew the veins with silver, and touched the edges of the leaves with gold. The gold background of the whole design is made of burnt gold and the tesserae are laid in circles, concentrating at the apex and widening as they descend and curve. But white I found to spread excessively, dark blue to tell as black, amber colour to become quite unreasonably dark, pale cool pinks even greyed very much at a distance, and required to be outlined with a strong red to give their value. Both warm and cool greys can be altered as to their appearance very markedly by the colour of the outline by which they are surrounded; outlined with blue, the whole mass by which the outline is surrounded appears to be influenced in a very distinct manner by its environment; so also does the same method hold good when the outline is red. Blue round white intensifies the blue as light, whereas outlined with red, the white appears pink. Strong yellow greens tell extremely well, but they must be outlined with a thick line of red or burnt sienna brown to give them their proper value. White lines in light green are very disastrous except at rare intervals; either a toned grey or a dull yellow breaks the green best. A black outline to blue is only necessary to divide the blue from gold, or to draw the folds of drapery where the lights of the blue are heightened with gold; the black outlining seems to preserve the integrity of the blue, whereas a red outline turns the blue into purple. A dark outline of blue on green gives a very mysterious effect, but, in that case, the blue must be a very clear one, and of a middle tint quality, otherwise the blue will tend to make the green appear muddy.

I have said that I made use of a good deal of silver, notably in the two spandrels and in the dome; I should not use so much silver upon another occasion: it has a great tendency to grey its surroundings. It looks very dark when not illumined. Upon the other hand, when flashing, silver has a greater power of light and of expansion than gold. A line of silver the sixteenth of an inch in width will eat through the lines of black almost as light eats into the lead lines of a window. The appearance of silver is easily attained without disadvantage by drawing a thin line of white and outlining it upon either side with a still thinner line of gold. The experiences in working out the dome were most interesting and instructive; the faults I committed were chiefly due to weak outlines, especially upon those parts of the design which have a golden background. The tesserae which I employed were, on the whole, too small, and from this fact there arose an excess of detail, because I

could use a greater number of small tesserae, and so put in more detail in a given space than I should have been able to accomplish with larger cubes.

The gold background to the design I think I may claim as a success. There is no burnished gold used whatever, the more cracked portions of the burnt cake were invariably chosen, lit here and there with brighter portions cut from same cake; and the gold was mixed, that is to say, red, green and blue gold were laid side by side. One reason for the brassy and unpleasant appearance of modern golden backgrounds is due to two causes: the first where the tesserae have been laid too flatly and too closely together; secondly, only one quality of gold, instead of many, has been adopted. Probably, of the two, the more disagreeable effect is obtained by the too close proximity of the tesserae, but also by the colour of the intonaco upon which they are laid. One need never be afraid of letting the ground show the 1-16th or even a $\frac{1}{4}$ of an inch in width round each cube. I would even go so far, under certain circumstances of light, to expand even that width. One is far more likely to err upon the thin than the thick joint. Gold set into a white ground never looks so well as when it is set into a red one, the white outline having a tendency to grey the gold excessively; in point of fact, to silver it, it is better to add white curves among the gold, wherever it is desirable to grey the gold.

I have noticed in old mosaics, notably those at the baptistry at Florence, that the ancients recognised the disagreeable appearance of the white line, for they have taken pains to colour the white division with red. It used to seem to me that the Greek mosaicists employed at St. Mark's, Venice, purposely put spots of black, green, or red among their gold, but I have been obliged to give up that idea upon more minute investigation, and to account for the presence of those black, green, and red spots from the fact that the upper layer of protecting glass has corroded where it has been thinly applied, the gold leaf going with it. Thus the colour of the ground upon which it has been laid has been revealed. These dark spots, doubtless, have a pleasant effect, but I think greater advantage is to be obtained by mixing with the brighter tesserae those which have been exposed to heat, and whose dappled surfaces reveal in thin lines all over the surface the colour of their grounds, and so they imbibe both the colour and the brilliancy of the metal. Burnished gold must only be used very moderately; it makes a garish effect, except in very thin lines.

In modern Italian restoration of ancient mosaic, bright burnished gold has been set up in the place of dull and broken gold; hence, the old work has been rendered vulgar and garish that was only rich and solemn. The mosaic in the apse of St. Ambrogio, at Milan, has been almost spoiled by coarse restoration in the time of my memory. Red disappears when white gold is used to heighten it in thick lines; it is blackened in the shadow and destroyed in the light, for while the gold shines excessively in full light, and consequently acts through the edges of every neighbouring colour, so in shadow does it become relatively dark, and an extremely powerful deflector of darks; whereas the modified or cracked gold does not shine so brightly, nor does it reflect and refract dark to the same extent when in shadow. You will probably remember how thin the spiked gold lines are which lighten the draperies of most of the earlier mosaics; how, when the gold flashes, they only seem to illumine the colour with which they are mixed, and when they are in shade only give splendour to that local colour. That is the right way to use gold. The black pigment made use of by the old mosaicists, Greek and Italian, as far as I have been able to ascertain, upon close inspection, was of a kind of cinder colour, or the grey black of coke, quite dull and unglossy in surface, and excessively corroded by the heat of the kiln. They had not a good strong black, so as a rule they adopted dark brown as an outline that told darker than the indifferent black at their command. It must be admitted that the brilliant light of the Italian skies does not oblige the outlines of forms to be so manifestly insisted upon as in our dark climate; there dark tells with much greater force than here; where, in Italy, a thin outline of brown would be quite sufficient to detach one colour from another, and to mark the form here to achieve the same result, double the thickness of outline and double its depth in colour is necessary to achieve the same result.

Messrs. Powell have supplied me with a splendid black, quite invaluable; in shadow it tells really black and becomes a deep and pleasant grey when the light falls directly upon it; in reflected light it assumes a sufficiently neutral dark to serve all purposes of a strong outline, so when the work is in full light the black outlines do not cut too sharply; a very unpleasant effect it is when they do, and in the shade they tell out with full force of tone and accentuate the colour portions which are for the time being in shadow.

I take it that we all learn more by our own mistakes than by what success we may now and then attain, and I apprehend that you, my audience, will gather more good from a detailed account of the growth of my work and of its shortcomings than

by a catalogue of my winnings. Not unnaturally one was led into certain mistakes to start with, and these mistakes have gradually taught one right principles—principles not founded upon theory, but upon practice and experience.

To revert to the progress of the work, after the completion of the small dome, as winter was coming on and the scaffolding was not completed, I decided to try two more panels upon slate; these two panels were executed in the workshop at Whitefriars. When these were put in place, I saw the utter futility, once and for all, of such a practice. My cartoons had been made previously, and set in place they looked strong and light, because of the non-lustrous quality of their surfaces. The mosaics, when seen bit by bit, side by side with the cartoons in the workshop, looked right, and unmistakably they are wonderful facsimiles of my drawings, but the moment I saw them placed among their surroundings—deep undercutting of mouldings and darkness—it was quite evident that they must be gone over and considerably strengthened, not so much in regard to their local colour as in emphasis of white and black. My dark outlines were thin, and my white lines too much toned, and we set at once to work to correct these defects, inserting outlines of half an inch in width, with the new black among the dark colours; and among the light colours we inserted very pure white drawing lines, or separating lines, especially where a blue and a red of the same tone were in juxtaposition. We also withdrew a great deal of bright gold and inserted dull. The effect was magical and fully rewarded the labour it obliged—for a labour indeed it was—and you will understand it when I tell you that so hard had the intonaco become that a mallet and chisel had to be made use of to remove each single tessera which had been laid into the wet intonaco, now, after the lapse of time of a little over a month, become as hard as flint.

I made up my mind, once and for all, that during winter as well as summer we would work *in situ* and not any more fumble away at such child's play as executing a decorative work away from its conditions of environment, a practice I believe to be quite fatal to successful decoration, and involving considerable loss of time and expenditure of energy, because, if the artist is conscientious, he is quite certain to feel himself bound, practically speaking, to re-execute the greater portion of his work, so that it may take its relative place among the objects, of which it should be one, and to which it must bear relation. The practice of painting the decoration in the studio and clapping it upon a wall, differently lighted and differently influenced by the character of architectural mouldings and surroundings is a mistake. I defy any artist, even of the greatest experience in decoration, to calculate his effects so minutely in a well-lighted studio so that his work shall appear in its proper relation to the objects which should be at once a part of it when placed in an entirely different lighting, and all the conditions of its environment are totally changed; nor do I think that anything but the roughest sketch for colour is desirable for the cartoon. Although every boundary line between shadow and shade, shade and light, should be very clearly defined, because the transposing from one material to another involves changes that can only be made under the eye of the artist himself. It is true that he can calculate roughly for the modifications a necessary part of transposition, but the more delicate modifications, which are the life and soul of success, he can only make when actually working in the material that is ultimately to produce his design; and for this reason it is necessary that the artist should be constantly upon the spot, watching the translation of his design from one material into another, whenever he cannot himself execute it. If he is not inclined to do this his work is sure to suffer, for, however clever the workmen may be, not one of them knows really what is the effect the artist has in his mind and which he desires clearly to render. We know by experience how, in a small way, pictures painted in a well-lighted studio totally change in appearance even when exhibited in a well-lighted gallery from what they were in the studio. And if this be true of an isolated picture, that it receives such a curious impression from its surroundings as to be scarcely recognisable as the same work under different conditions, how much more must the same law apply to a large scheme of decoration.

In the work which has been recently uncovered I believe that most of the faults which I have confessed to exist in my previous efforts have been overcome. At the same time we are all learning: every day of experience brings new light upon our beautiful art; and while one can never expect to attain perfection, I have no doubt that every fresh adventure will be more successful than the last. The confidence of the public as well as the kind manner with which our labours have been received by the Press, stimulate us to fresh exertions for the public's instruction and delight.

So have we gone on from space to space, learning and, I hope, improving, until now more than two-thirds of the choir are complete; and if all goes well I shall have the honour next Easter year to show to the English public a complete scheme of decoration, carried out and fulfilled by English workmen

upon a scale second to none in Europe. A new art acquired, a new craft learned and its difficulties conquered.

And now a word from the ethical point of view.

In a moment of decadence in literature and in certain forms of art, we are told that art for art's sake is alone to be permitted. Surely that is a very dangerous axiom. In the best times of art, whether in early or recent pagan times, or early or recent Christian times, religion has been glad to accept the services of art to give substance and reality to her mysteries.

The morality of art, the impulses which draw her to choose the noblest events in the history of the world as texts wherein to lay her gold and silver, her colour and her jewels, are aided and strengthened by that consecutive stream of sacred thought upon immortal themes that have exercised man's intellect and feeling even from the prehistoric ages until now.

It is not for us to lay aside such restraints upon our fancies, and such purifying motives which are induced, by illustrating upon the walls of our churches for the use and service of all, in a moment when materialism of many gross kinds is poisoning literature, art and the drama.

Let us have the best art in our churches that can be obtained, and let the walls of the houses of God be the sacred picture galleries, free for our people, where they can learn nothing but good, by seeing beauty and purity attired; where they can read the old stories of the childhood of the world; where they can be refreshed, mind and body, by the study of the beautiful; that beautiful, which, to be perfect, must unite the material and the spiritual.

THE PRESTON ARCADED BLOCK.

TWENTY sets of drawings were sent in for the new commercial premises which Mr. N. Miller is about to erect on a site containing 2,500 square yards, bounded by Church Street, Lancaster Road, Birley Street and Jacson Street, Preston. The block will consist of fireproof shops, two licensed houses, an auction room, &c., and will cost about 50,000*l*. Mr. E. Salomons was appointed assessor.

The first premium of 150*l*. has been awarded to Messrs. Essex, Nicol & Goodman, of Birmingham and London; the second of 100*l*. to Mr. E. W. Johnson, of Southport; and the third of 50*l*. to Mr. G. G. Hoskins, of Darlington.

The following is the description which accompanied the successful design, which is of a Spanish Renaissance type:—In settling the width of the arcades we have made the one from Church Street to Jacson Street the narrower, owing to the extreme value of the frontage to the former street, and by the fact that this arcade takes from the width of the shops and not the depth, which is the case with the wider arcade from Birley Street to Lancaster Road. Fortunately the shape of the site favours this arrangement, as the wider arcade is also the longer and will form the better promenade, and the arcade from Church Street, being the main entrance, can better afford to be the narrower, as its position alone will render it sufficiently inviting. The following important points in the design of retail shops and arcades have been observed:—Under no circumstances should there be corner pillars or piers at the arcade entrances or at the four angles of the block, but these should either be treated as doors or windows, and the shop fronts should continue uninterruptedly from the streets into the arcades, thus almost unconsciously leading the public into them, instead of, as is unfortunately too often the case, the entrances being obstructed by corner pillars, and in some cases even blocked by staircases leading to the upper floors, and causing a sense of intrusion in the minds of persons about to enter, and deterring many from doing so, thereby militating greatly against the success of arcades. The two office entrances in Church Street give an easy ascent to the first floor, and thence the main stair is continued over the arcade entrance to the second, third and fourth floors. The three upper floors have surrounding corridors, giving access to the whole of the rooms, with a Church Street or a Lancaster Road address as desired, an additional staircase being provided in Lancaster Road, running from the basement to the top floor, and forming the principal approach to the auction-room. The passenger and luggage lifts are placed next this staircase, in close proximity to the caretaker's apartments, so that he is conveniently placed for attending upon the lifts and controlling the use of the inclined way to the basement. We have shown no strong rooms for the offices, as the floors being of fireproof construction they can be built in any position to suit the requirements of tenants. We would suggest that the offices be furnished with speaking tubes, and connected with boards fixed in the vestibules next the street, with space left for the name of each tenant. On reference to the plans of the upper floors, it will be seen that the lavatory accommodation is so placed that access can be gained to the whole of the offices without having to pass the lavatory doors; an advantage which will doubtless be fully appreciated by the tenants; we have also planned these lavatories so as to obtain cross ventilation.

The basement we have treated as a repetition of the ground floor, thus forming a kind of lower arcade, and approached by two staircases, one from Birley Street and the other from Lancaster Road, supplemented by the office staircase and passenger lift in the latter thoroughfare. We have appropriated the 6-feet space under the pavement as a surrounding footpath, but if this could be extended in width by building the retaining wall under the curbstone over, it would increase the underground footpath to about 12 feet, which would be a great improvement, and we should think there would be little difficulty in bringing this about with the Corporation, as we apprehend there can be no structural difficulties in the way.

We have adopted a contrivance which we have recently seen successfully carried out in several important blocks of shops in Wiesbaden, viz. of providing a narrow area of about 15 inches wide in front of each shop, on the street level, enabling the shop fronts to be continued down to the basement and to the sub-basement where required; by this means goods exposed in the basement shops can be seen from the street level, the angle of sight being, of course, from the line of the stall-board of the ground-floor shops. These narrow areas are protected by light iron ornamental railings about 2 feet high, so designed as to impede the view of the basement as little as possible. By this arrangement the basement shops can be let separately, and yet the goods exhibited in the windows can be seen from the street over as well as from the underground arcade, and the names of the basement shopkeepers and trade announcements can be attached to their shop fronts and be seen from the streets or the upper arcades as the case might be. To meet the wants of the ground-floor shopkeepers who do not also have a basement, two blocks of lavatories are provided, one at the Birley Street and the other at the Lancaster Road end of the lower arcade, both being divided to give accommodation for both sexes. We consider Jacson Street unsuitable for shops, so have not planned any fronting that street, and as the frontage to the arcade is much more valuable we have arranged the shops to face that way instead; for this reason we have also placed the hotel service entrance and the incline to the basement in Jacson Street. We have aimed at providing a selection of various sized shops both in the streets and arcades, which is very essential to meet the requirements of different trades and businesses, as it is a serious mistake to have too many of the same size. It is desirable to furnish the ground-floor and lower arcades with fire hydrants, having hose permanently attached. A flat asphalted roof is shown, excepting next to Jacson Street, and where towers occur. This roof can be readily utilised for future extension without interfering in any way with the occupation of the rooms under, and we have carried the two staircases and passenger and luggage lifts up for this purpose. To obtain the greatest available floor space, it will be seen that the façades to Birley Street and Lancaster Road are quite flush with the streets, and that where in Church Street and Jacson Street, on the first and second floors, portions have been slightly recessed to obtain bay windows and architectural effect, the depth and not the width of the rooms is affected, the proportion of these rooms being really improved thereby, the bay windows generally compensating for the loss of the parts recessed.

The Wine Lodge.

The ground-floor space asked for is complied with, and is divided into two sections, the smaller portion next the arcade being available for a family trade if desired. We have provided in the basement a room which will be useful for the barmen to take their meals in, &c. Lavatory accommodation is also supplied. In the sub-basement is formed a cellar, the full size of the wine lodge premises, the three floors being connected by a staircase. We have shown a lift instead of a rolling way running between Lancaster Road and the sub-basement; but to avoid this initial expense, and also the cost of maintenance, a rolling way can be formed from the basement level to the sub-basement instead, in the same way as is arranged for the hotel.

The Hotel.

We consider the best kind of hotel for this situation to be a combination of hotel and restaurant, with second-class bar in the basement, as suggested, and the restaurant can also have a frontage to the arcade by appropriating one of the shops for this purpose. The entrance to the hotel is so placed that it will be equally well seen from the Market Place, and also from Church Street, as approached from the railway stations. A billiard-room, for three tables, is placed on the first floor, as this will probably be a good source of income, worked in connection with the restaurant as well as the hotel. In addition to the coffee and commercial room, a farmers' ordinary room is also provided, which can also be used as a large stock-room. Bedrooms, kitchen department, servants' bedrooms, &c., are provided for.

The Auction Room.

We consider an auction room on the top of the building inadvisable, and have placed it on the second floor level

instead, and in close proximity to the staircase and passenger and luggage lifts from Lancaster Road. The auctioneer's and solicitor's retiring room is so situate that it can be entered from the auction room without going on to the public corridor, and has also a private approach from the main staircase.

The Caretaker.

The caretaker's apartments are provided on the upper floors, at the corner of Lancaster Road and Jackson Street, and conveniently near for attending upon the passenger and luggage lifts. In case of fire the inmates of these apartments can escape across the flat roof and down the other staircase into Church Street, or through the hotel.

Construction.

The whole of the stanchions and girders are to be of steel, encased with fire-resisting materials; the main girders supporting the walls over the shop-fronts next the streets and arcades are supported by steel stanchions carried through the basement and ground-floor storeys in one length, and encased with glazed terra-cotta externally and with concrete internally. The stanchions in the interior of the building are all encased with concrete, and are carried up to the top floor, supporting, where necessary, the cross girders carrying the concrete floors. The whole of the suspended flooring will be of breeze concrete, plastered on the underside and finished on the upper surfaces in the shops, offices, office corridors and other rooms, except lavatories, with pitch-pine herring-bone parquet flooring. The flat roof is covered with asphalt. The arcade passages on the ground-floor will be laid with buff tiles, grooved diagonally to afford a good foothold, and the lower arcades and surrounding corridor will also be paved with the same tiles, but laid on asphalt instead of concrete. The structural work is so arranged that the whole block can be built with the outside walls to the streets and arcades and floors only inserted, and including the office staircases, lifts and stack. The retaining walls in the basement will be lined with white glazed bricks with coloured brick bands. The roofs of the turrets and central towers and mansard roof over the hotel in Jackson Street will be covered with red pantiles. The office staircases from Church Street, and the staircases leading into the lower arcade from Birley Street and Lancaster Road, will have Hawkesley's patent wood-block treads in iron frames carried upon iron strings, as these stairs wear exceedingly well, are comparatively noiseless and afford a good foothold. The office staircase from Lancaster Road and also the two hotel staircases will be built with granolithic concrete, thus giving two fire-resisting staircases in the hotel and one in the main block. The two office entrances in Church Street, and the office entrance in Lancaster Road, will have white marble steps next the street, and the vestibule spaces will be laid with white tiles and ornamental borders in black, and the same treatment will also be adopted in the hotel vestibule and entrance hall. The columns and pilasters to the hotel entrance will be of red granite. The gates to close the arcades will be Bostwick's patent collapsible gates. The inclined way to the basement and the level platform to the luggage lift on the ground floor will be of granolithic concrete grooved to give foothold. The roofs over the arcades will be supported on light ornamental wrought iron principals and have patent metal glazing bars, and will be glazed with $\frac{1}{4}$ -inch clear plate glass, with narrow embossed borders and corner ornaments.

Decoration.

Externally the façades will be finished with terra-cotta to the top of the shop-front cornices, including the raised portions over the entrances to the arcades as before described, and the remainder of the first and second floors will be of good red-face bricks, with unglazed buff terra-cotta dressings. The third-floor portions of the towers over the arcade entrances, and the gable projections in Church Street and Jackson Street, together with the third and fourth floor portions of the angle turrets, will be finished with these materials. The arcaded portions of the third-floor storey, the fourth floor over the arcade entrances, and the two gables in Jackson Street and Church Street, together with the octagonal top storeys of the angle turrets, will be completely faced with unglazed buff terra-cotta. The roofs will be covered with red pantiles, and the whole of the wood-work above the shop-fronts will be painted white. The shop-fronts to the ground-floor will be of oak polished. We propose to face the interior of the arcades as follows:—The ground-floor storey will be of glazed terra-cotta; the shafts of the pilasters supporting the ornamental iron principals to be of red Ogwell marble, with pedestals of dark Ashburton marble, and the caps and bases of stone, solidly gilt; the plain wall-surfaces to the first and second storey will be of white-veined marble, and the frieze to the top cornice will be of yellow-clouded Petitor marble; the remainder of the work, including the dressings to the windows, &c., will be of tinted Faience ware.

Lighting.

We think that some general scheme of external lighting, both in the arcades and the four streets, and maintained by the

proprietor, is very desirable, as enhancing the attractiveness of the building, and we recommend for this purpose that opal globes, supported by ornamental brackets, be used in the positions indicated on the drawing, and lit by incandescent gas arc lights. These gas-lights give the same effect as electric lighting, and can be obtained of much less candle-power than electric arc lamps, and as a multiplicity of globes give a better appearance than a few lamps of great candle-power, we adopt this method in preference to electric lighting. Gas will be laid on to the hotel for cooking purposes, and also for supplementing the lighting of the staircases and corridors. The latter also applies to the office staircases and corridors.

Heating and Ventilating.

We recommend the system of heating by hot water in preference to hot air, as in a building of this description, where the partition walls are liable to be moved from time to time, alterations can be much more easily made to supply pipes to the radiators and the positions of the latter changed, than would be the case in dealing with hot-air flues, which, to be effective, must be of large capacity, and generally form part of the main structure of the building. Another serious objection to the hot-air system is that, where the floor space is most valuable, viz. the lower floors, the greater space is occupied by hot-air channels and flues. Having adopted the hot-water system, we have provided a stack, boiler and fuel stores. Provision is made for the effective draining of the premises.

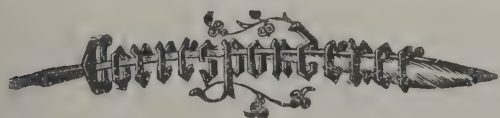
PROVINCIAL MUSEUMS AND ART GALLERIES.

ON Monday a loan exhibition was opened in the Walsall Free Library. Mr. Whitworth Wallis, the curator of the Birmingham Art Gallery, delivered an address. He said it would have been more satisfactory if an artist occupied his place on the occasion. He could lay no claim to being an artist in the usually accepted sense of the term. If not an artist, however, he was in some degree a teacher, as the museum which he had the honour to direct was a school of archaeology and of art—a school where they were always endeavouring to bring the best influence of the art of the past to bear upon the art of to-day, so that the study of beauty and its introduction into material objects, the household chattels of the present time, from jewellery to enamelled ware, pots and pans, might be fostered by the students and artisans engaged in the numerous industries connected with the great Midland metropolis. There were no limits to the progress to be made in this direction, just as there were no boundaries to the reality of the earnestness which the working man—or, better still, the manufacturer—might bring to bear in beautifying the objects which it was their business to produce. He trusted no one would think him unmindful of the great kindness of Mr. Hill, the owner of the collection of pictures before them, for no one knew better than he did himself the great self-denial practised by owners of fine works when allowing their treasures to be removed from the dining-room or drawing-room walls for the benefit of the public, when he said—and he said it in no captious spirit—he was sorry that in the collection it had not been possible to gather together a few fine objects of industrial and decorative art from the immediate neighbourhood. He was, however, delighted that the Kensington loan was there, and the objects shown would teach the people of Walsall that art could be more than water-colours and oil paintings, bronze or marble statues, and that there was just as much art in a beautiful chalice from some old monastery, in the wood-carving of cathedral choir-stalls, or the painted saints upon its windows, and the thousand and one objects of everyday life if endowed with beauty of form and design, as in the numerous pictures which covered the walls of their galleries in London and the provinces. He hoped the collection might lead to the founding of such a museum, not of fossilised and barbarous curiosities, such as the bridle worn by a Derby winner, or the handcuffs worn by Palmer the murderer, which were offered to him, but objects which should have more than a passing interest for the student and workman—a museum to which men might bring their wives and families after their work was done (for it must be open in the evening), and by contemplation of the objects be lifted out of themselves. The study of such objects would bit by bit raise a more intelligent idea of what was good and what was bad in taste and in style, and the occasional half-hour spent in looking at such treasures should provide pleasure, not at the time, but after, for the reason that being things of beauty they should be joys for ever. In a rich locality like that there must be many ladies and gentlemen, who, without missing the money, could give a few thousands to form a small museum and art gallery. To this the municipality could contribute, and they would, he was sure, receive ample aid from the Science and Art Department; for he held it was the province of that department, and of every municipality, to provide something of art culture,

even in a small way, for those who could not avail themselves of the advantages which were offered by larger towns. Mr. Wallis then alluded to the good work done by the local school of art, and warned his hearers not to regard the study of art as a light or gentlemanly calling, by which they might easily stride up the ladder of fame as a member of the Royal Academy. All really great art demanded the devotion of a lifetime industry, together with earnestness, a vivid, lofty imagination, and a fine sense of noble colour—the latter a godlike gift vouchsafed to few. He asked all who had such a conception of the ease of art to pause before they entered upon the fierce struggle for life and fame among the already overcrowded ranks of picture-painters, and see if they could not turn their attention to design for manufacturers, to the interior decoration of houses and public buildings, and to illustrations of books, similar to the good work done in this respect by the Birmingham school. Three fields of art to be explored and conquered were here opened to them, and it was infinitely to be preferred that they should assist in the production of beautiful and delightful specimens of industrial and decorative art than that they should eke out a precarious existence by the painting of meretricious and effete pot-boilers. Having enlarged upon these points and impressed upon his hearers that the highest art was closely and generally allied to extreme simplicity, and that the possession of ample means was helpless in the domain of art without cultured taste and refinement, Mr. Wallis said the best and greatest art, the gentle-hearted adoration of the fifteenth and sixteenth century Italian, the stern and vigorous realism of the Dutchman, the mystic ideals of the Flemings, the golden glories of the Frenchman Claude, the ineffable beauties of Ramsey, Gainsborough and Reynolds, the brilliant colourings of Turner; the fresh, breezy landscapes of Constable, Crome, De Wint, and dear old David Cox; and last, but not least, the triumphs of that most remarkable development of art, or art movement, of modern times, the works of the English pre-Raphaelites, Mr. Holman Hunt, Millais and Ford Madox Brown—those, and the works of kindred spirits, would endure. The study of art, he said in conclusion, was a life study; it was never finished, and never could be finished; therefore, he did not think it should be looked upon as a fascinating and a profitable way of spending one's time, but rather as a pursuit which should lift one out of the materialities of time, and carry one forward to higher refinement and higher progress.

BRADFORD SOCIETY OF ARCHITECTS AND SURVEYORS.

THE members of this society had their summer excursion on Friday last to the ancient city of York. Among those present were Mr. Wheeler Smith (president), Messrs. H. Perkins and A. B. Burleigh (president and secretary of the York Architectural Society), Messrs. T. H. Healey, Charles Gott, C. H. Hargreaves, W. B. Woodhead, B. D. Fairbank (hon. secretary), John Hindle, R. Armistead, T. C. Hope, B. Cowgill, James Young, H. Marten, J. Flew, Thomas Barker, C. E. Milnes, C. H. Gott and A. G. Adkin. Ladies again joined the excursion. Luncheon was served at the Royal Station Hotel on arrival, and afterwards the party went to view the Minster, St. Mary's Abbey, and other interesting buildings. After dinner "The Health of the Guests" was proposed by the President, and responded to by Messrs. Perkins and Burleigh. The toast of "The Ladies" was submitted by Mr. C. H. Gott, and responded to by Messrs. Armistead and Healey. A photograph of the group was taken by Mr. Burleigh in the hotel gardens, and the party returned home after a very pleasant trip.



Some Architect's, Surveyor's and Valuer's Text-books.

SIR,—Serious mistakes are frequently made by members of our profession, owing to not having a text-book clearly showing the orthodox way of preparing valuations, and the great difference in amounts between their valuations tends to bring it into disrepute.

Although nearly all architectural surveyor's text-books state that ground rents are worth from 25 to 30 years' purchase, still, where examples of valuations are supplied, the ground rent is deducted as an annual leakage, instead of it being capitalised separately, thereby giving a fictitious sum as the value. Professor Banister Fletcher, who is the author of several very valuable professional works, unfortunately does this in his "Valuations and Compensations," 1893, pp. 87-88. "Suppose your client holds upon lease for twenty-three years

unexpired, at 50% a year, a property let on weekly tenancies, and producing a gross rental of

Per annum	£500 0 0
From this we must deduct ground rent .	£50 0 0
Rates and taxes, losses by empties, &c., annual repairs, insurances, &c., 33 per cent., or one-third .	166 0 0
	216 0 0
	284 0 0

This income for 23 years, to pay 6 per cent., is worth 12'30 years' purchase, or	3,493 4 0
Now suppose the value of the dilapidations be	300 0 0
The remainder	3,193 4 0

will represent the value of the property."

The learned gentleman also falls into the error of using the wrong tables, which give the same rate of interest for the sinking fund as the interest required on the capital, and this is an impossibility (see pp. 121-23). He should have used those contained in Hurst's "Architectural Surveyor's Handbook," 1891, pp. 416-18, which give 3 per cent. compound interest for the sinking fund to replace the capital and 6 per cent. on the capital. The correct working out of the example aforesaid would be thus:—

Gross annual rental	£500 0 0
Less annual leakages	166 0 0
	334 0 0
23 years in the 6 per cent. table gives years' purchase	11'0115
	3,677 16 9
Less capitalised value of ground rent	£50 0 0
Secured for 23 years in the 3½ per cent. table gives years' purchase .	15'1943 = 759 14 3
	2,918 2 6
Less dilapidations	300 0 0
Correct value	2,618 2 6

Or a difference of 575*l.* 1*s.* 6*d.*, which a purchaser is asked to pay in excess of the value. In another example, at pp. 24-26, the gentleman makes the same mistake, and at p. 84, through using the 4 per cent. table for the rack rent and the 5 per cent. for the ground rent (besides giving the wrong multiples), a mistake is made amounting to 2,826*l.* 2*s.* Notwithstanding the article on the "Valuations of Buildings" in Hurst's excellent work aforesaid, pp. 380-381, is most exhaustive, still the following paragraph is most misleading, as a valuer might be induced to fall into the same error as the professor and others have done: "When the ground is held on lease, its rent becomes a deduction from the gross rental received by the owner of the buildings," whereas at p. 383 the reader is informed that ground rents six times covered should yield interest from 3½ to 4 per cent.

Another mistake made by surveyors is that of using the same table for the freehold interest as that of the leasehold. This should not be done owing to the risks of forfeiture on a breach of any of the covenants usually contained in short leases. It is to be regretted that the Earl of Derby's surveyor recently did so, in addition to wrongly treating the ground rent as an annual leakage. See a pamphlet on "The Derby Estates," 1894, by "W. B." Lord Derby and other large land-owners are now graciously willing to change the customary 75 or 99 years' leases for long leases of 999 years, or practically freeholds (as the value of the reversion beyond this time would be *nil*), on payment of a fine commensurate with the benefit derived, or will in the alternative commute the fine into an annual ground rent in addition to the one already existing. The Liverpool Corporation sell the reversions of their properties and commute the purchase money into perpetual ground rents; and an absurd theory has sprung up which is calculated to do an immense amount of injury to owners of real estate, viz. that the difference in value between a 75 years' lease and a freehold is about 5 per cent.; *vide* "The Liverpool Corporation Leaseholders' Committee's Report," 1887, pp. 71-84, and a letter written to Lord Derby by Mr. W. Evans, President of the North Liverpool, Bootle, Walton and West Derby Property Owners' Association. See the *Liverpool Mercury*, February 11, 1895. This arises from using the wrong tables. On referring to Inwood's (common) "Tables for Valuing Estates," 1870, p. 8, in the 5 per cent. column it will be found that the multiples of a 75 years' lease are 19'485, or about 19½ years' purchase, whereas in perpetuity they are 20'000, or about half a year's

purchase difference; but, as previously pointed out, this is not the correct table to use, as it is assumed that the same rate of interest can be obtained for the sinking fund to replace the capital invested as that at which the property is purchased, which amounts to an absurdity. Hurst's said work, pp. 384-418, should be consulted, where 5 per cent. interest is given on the purchase money, and the sinking fund is worked out at 3 per cent. compound interest, and the multiples respectively of a 75 years' lease and a freehold are 18'633 and 20'000, or about 1½ year's purchase difference; and still further, as the same table should not be used for a freehold interest as for a leasehold one for a short time—as previously referred to, the 5 per cent. should be used for the freehold and the 6 per cent. for the leasehold—the multiples would be 20'000 and 15'706, or nearly 4½ years' purchase difference; if the 6 per cent. is used for the former class and the 7 per cent. for the latter, the multiples would be 16'667 or about 16½ years' purchase, and 13'574 or 3'093 years' purchase difference; or about 18½ per cent. and not 5 per cent. In Gwilt's "Encyclopædia of Architecture," 1881, which is considered to be a work of erudition, an example is given at p. 1079 in which the rent paid by the lessee is less than the actual value of the premises; the 5 per cent. table is used, whereas it occurs to me the 6 per cent. one would be the correct one to use. This would give 10'540 years' purchase, and not the wrong multiples of 12'8211. The whole of the tables at pp. 1102-5 are inapplicable for valuing estates, and are almost similar to those of Professor Fletcher. Another example at p. 1080 is misleading; the annual leakages are excessive, and a bracketed note states, "In a leasehold valuation the ground rent would also have to be deducted," so that the valuer following this advice would make the same mistake in a similar way to the professor; the wrong multiples are also used. Tarbuck, in his "Handbook of House Property," 1875, pp. 177, 178 and 179, deducts the ground and quit rent wrongly as an annual leakage, and at 70'190 he supplies an example of copyhold tenure, and states that "freehold value, less cost of enfranchisement, may be thus calculated":—

Net income of	£100	
Multipled by years' purchase	25 =	£2,500

For the fee simple.	
And capitalising the net rent	£100
At the age of seventy at years' purchase	5 = £500

Adding for a clear quit rent of 10s. per annum, twenty-eight years' purchase	14
For a heriot, best beast	10
One-fifth the yearly land rental or minerals	10
And one-fourth value of timber, or	16
	<u>550</u>
	£1,950

Steward's fees, with other expenses, have not been taken into account.

In general practice is it not better to use the 5 per cent. table, instead of the 4 per cent. one, for the freehold (which is usually adopted for ground rents)? The example would then work out thus:—

<i>Freehold Interest.</i>		
Net income of	£100	
In the 5 per cent. table gives years' purchase	20 =	£2,000 0 0

<i>Cost of Enfranchisement.</i>		
Net rental	£100	
At the age of seventy, years' purchase	5 = £500	
Heriot	10	
Minerals	10	
Timber	16	
	<u>536 0 0</u>	
	£1,464 0 0	

Yearly quit rent	£0 10 0
In perpetuity 3½ per cent. table, years' purchase	28'571
	<u>14 5 8</u>
	£1,449 14 4

Exclusive of steward's fees, 11% 10s., and valuer's and solicitor's fees.

In this case the way the quit rent is treated is immaterial, as it is not deducted as an annual leakage, leaving the remainder to be capitalised like the examples given at pp. 177, 178 and 179, but still I think the form adopted by me appears to be more correct in keeping the quit rent distinct from the other deductions. An able paper on the subject of "The Enfranchisement of Copyholds of Inheritance" was read at a meeting of the Institution of Surveyors, January 10, 1870, by Mr. W. Smyth, and was duly recorded in the columns of the *Building News*. The new Copyhold Act, 1894, has come into operation; it annuls a part of the previous acts. The publication of the "Calendars of State Papers" and the "Records of the Manorial Courts Baron" within the last two decades has thrown new light on the question. The minutes of the Board of Agriculture, annuity tables and scale of compensations, to be obtained from the secretary, should be consulted by the student of this branch of the profession. It is my sincere wish that the gentleman whose works have been referred to will take it in good part within the interests of the profession; and that the subject matter will form the basis of a standard work which I hope to issue ere long—Yours,

JOSEPH HENRY MCGOVERN,
Fellow of the Liverpool Architectural Society.
8 Vernon Street, Liverpool:
June 20, 1895.

GENERAL.

The Restoration of Metz Cathedral, which was suspended twenty-five years ago through the Franco-German War, is to be resumed. A lottery to raise funds has been sanctioned by the Government.

Marble weighing 72,999 tons was sent by sea from Carrara and Massa during 1894. Out of that quantity 19,293 tons were imported to Great Britain, and 28,669 tons to America.

Sir Whittaker Ellis has been elected chairman of the Privileges Committee of the Corporation of London in succession to Sir William Lawrence, who lately retired.

Mr. H. S. Marks, R.A., has removed from Hamilton Terrace to 5 St. Edmund's Terrace, Regent's Park, N.W.

Mr. Lerner Sugden, of Leek, has been elected surveyor to the Stoke Rural District Council and engineer to the Bucknall sewage scheme.

Mr. James Blyth has offered 300*l.* to the British Dairy Farmers' Association, in order that three prizes of 100*l.* each may be offered at their forthcoming show at Islington for drawings and plans for dairies, also for the best limited size model permanent dairies and for the best portable dairies.

A Meeting of the Iron and Steel Institute will be held in Birmingham on August 20, 21, and 22.

The Bill for the rebuilding of Vauxhall Bridge has passed the Lords Committee.

The Helensburgh Naturalist and Antiquarian Society on Saturday visited the rock sculpturings at Auchentorlie, Bowling, which were recently discovered by one of the members.

The Arts and Crafts Exhibition in Manchester, which closed on Saturday, was visited by 527,577 people during the eleven weeks it was open.

Baron Edmond Rothschild has bought and presented to the Louvre the Bosco-Reale treasure, consisting of forty silver articles, which were tied up and concealed in a niche at the time of the destruction of Pompeii in the year 79. The Louvre had declined to give the 500,000 frs. demanded for the collection.

The Siddons Memorial on Paddington Green is to be an adaptation of Reynolds's portrait of the actress as *The Tragic Muse*.

Sir F. Leighton, P.R.A., was present at the marriage of the Duc d'Aosta and the Princess Hélène of Orleans at Surbiton on Tuesday.

The Seascope by J. S. Cotman, which excited extraordinary attention when exhibited at Burlington House, has been ceded by Messrs. Agnew, who bought it at the sale of the Price collection, to the trustees of the National Gallery.

A Company has been formed for the purpose of creating a summer and winter resort, under the title of Mayville, on the French coast, in the neighbourhood of Etaples. Calais and Boulogne are no longer attractive; there is consequently an opening for the new Mayville, which will have all the advantages that experience has shown to be necessary. It is sufficient to say that M. Charles Garnier, of Paris, and Mr. A. Darbyshire, of Manchester, will be responsible for the architecture, in order to make it clear that grace, beauty, comfort, and sanitation will be the characteristics of the dwellings. The company is as much deserving of support in England as in France, and it is likely to be most prosperous for the shareholders.

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There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

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COMPETITIONS OPEN.

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BEDMINSTER.—Jan. 10.—For Building Board Schools, Victoria Park. Mr. E. W. Barnes, Architect, Guildhall Chambers, Bristol.

BELFAST.—Jan. 4.—For Walls, Gates, Railings, &c., at New Market Yard. The City Surveyor.

BELFAST.—Jan. 17.—For Supply and Erection at the New Service Reservoir at Knockbracken of Cast-iron Standpipes, Valves, Outlet Mains of Steel and Cast-iron, and Sundry Ironwork; also Steel Lining for Outlet Tunnel, for the Belfast City and District Water Commissioners. Mr. R. Hamilton, Secretary, Waterworks Office, Belfast. Mr. L. L. Macassey, Engineer.

BLACKPOOL.—Jan. 4.—For Extensions to Central Stores, for the Industrial Co-operative Society, Limited. Messrs. Garlick & Sykes, Architects, 51 Market Street, Blackpool.

BLENCOCO.—Jan. 4.—For Building Dwelling-house. Mr. J. Coate, Wigton.

BRADFORD.—Jan. 4.—For Building Mill Chimney (40 Yards High). Mr. Thomas Barker, Engineer, 5 Bond Street, Bradford.

BRADFORD.—Jan. 17.—For Building Warehouse, Clifton Street, Manningham. Messrs. Empsall & Clarkson, Architects, 65 Tyrrel Street, Bradford.

CALNE.—Jan. 5.—For Part Building of Studley Brook Bridge. Mr. Charles S. Adye, County Surveyor, Trowbridge.

CHELSEA.—Jan. 14.—For Repairs, Painting, &c., at Embankment Gardens and Pimlico Shrubberies. The Architect's Department, County Hall, Spring Gardens, S.W.

CORK.—Jan. 7.—For Building Coastguard Station and Look-out Tower, Union Hall. Mr. P. J. Tuohy, Secretary, Office of Public Works, Dublin.

FELTHAM.—Jan. 14.—For Building Twelve Pairs of Semi-detached Villas. Mr. R. F. Anderson, C.E., Ryde, Isle of Wight.

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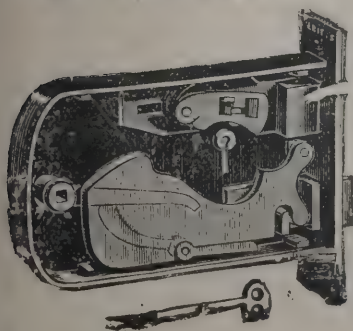
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FFORCHDWM.—For Additions to House. Mr. John C. Jones, Architect, Baglan, Briton Ferry.

FULHAM.—Jan. 15.—For Building Branch Free Library, Wandsworth Bridge Road. Messrs. Arthur Billing, Son & Rowley, Architects, Bank Chambers, Tooley Street, S.E.

GOOLE.—Jan. 14.—For Alterations to Steam Packet Tavern, George Street. Mr. W. B. Andrews, Architect, Boothferry Road, Goole.

HEATON.—For Building Baptist Chapel. Mr. John Jackson, Architect, Barry Street, Bradford.

KEGWORTH.—Jan. 19.—For Construction of Covered Reservoir of Capacity of 50,000 Gallons, and Providing and Laying 6 Miles of 4-inch and 3-inch Cast-iron Pipes, with Sluice Valves, Fire Hydrants, &c. Mr. George Hodson, Engineer, Bank Chambers, Loughborough.

KIDDERMINSTER.—For Taking-down and Rebuilding Shops and Premises. Mr. J. M. Gething, Architect, Oxford Chambers, Kidderminster.

KILKENNY.—Jan. 10.—For Supply of Close-fitting Cooking Range for the Fever Hospital of the Workhouse, for the Guardians. Mr. Kieran Comerford, Clerk.

LEEDS.—Jan. 12.—For Building Parcel and Superintendent's Offices. Mr. W. Bell, Architect, North-Eastern Railway, York.

MARYBOROUGH.—Jan. 5.—For Additions, &c., to Lunatic Asylum. Mr. P. J. Tuohy, Secretary, Custom House, Dublin.

MORLEY.—Jan. 4.—For Building Two Villas, Dean Hall Estate. Mr. T. A. Buttery, Architect, Queen Street, Morley.

PAIGNTON.—Jan. 31.—For Construction of Storage Reservoir, Two Filters and Works Connected, for the Local Board. Messrs. John Newton & Son, Engineers, 17 Cooper Street, Manchester.

PENRHUWCEIBER.—Jan. 8.—For Building Forty Houses. Mr. S. Rooney, Architect, 9 Quay Street, Cardiff.

PENZANCE.—Jan. 14.—For Building Day School for St. John's. Mr. Henry White, Architect, 1 Parade Passage, Penzance.

PONTYPRIDD.—Jan. 30.—For Construction of Tramroad 1 Mile 30 Chains in Length, Laying a 15-inch Cast-iron Conduit Main (1 Mile 55 Chains in Length), Construction of a Reservoir, Seven Filter-beds and Service Tank in Valley of Rhondda Fach River. Mr. Togarmah Rees, C.E., Corn Exchange Chambers, Newport, Mon.

PRESTON.—Jan. 16.—For Constructing Small Reservoir and Laying Water Pipes at Preston, near Linlithgow. Mr. James Strang, C.E., Falkirk.

RIBCHESTER.—Jan. 12.—For Building Free Church. Mr. J. A. Seward, Architect, 16 Lune Street, Preston.

SCUNTHORPE.—Jan. 4.—For Building Schools for Girls and Infants. Messrs. Smith, Brodrick & Lowther, Architects, Cogan Chambers, Hull.

SKIBBEREEN.—Jan. 12.—For Construction of a Reservoir, Filter Beds, River Diversion Pipes, Fountains, Hydrants, Valves, Pipe-laying and Erection of Caretaker's House. Mr. Richard W. Walsh, C.E., 10 South Frederick Street, Dublin.

STAMFORD.—Jan. 18.—For Building Post Office. The Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

ST. GEORGE'S, HANOVER SQUARE.—Jan. 12.—For Works and Materials for One Year. Mr. G. Livingstone, 1 Pimlico Road, S.W.

STOCKPORT.—Jan. 16.—For Providing and Fixing Fuel Economiser, for the Corporation. Mr. A. M. Fowler, 1 St. Peter's Square, Manchester.

SWINDON.—Jan. 15.—For Building Wesleyan Chapel, Vestries, &c. Mr. Thomas S. Lansdown, Architect, Bath Road, Swindon.

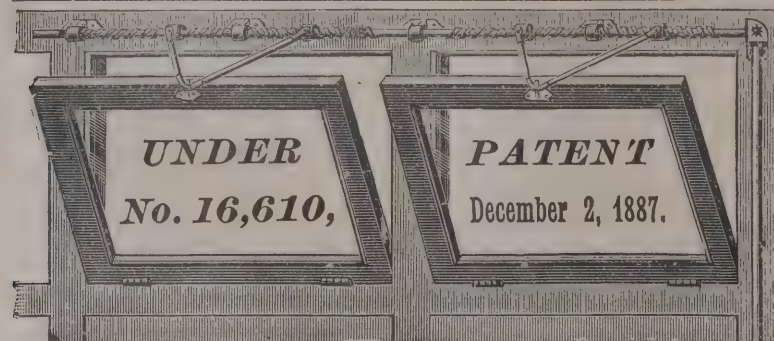
UPPER BATLEY.—Jan. 11.—For Alterations to Elmwood House. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

WEST MALLING.—Jan. 8.—For Repairs, &c., at the Workhouse. Mr. Henry D. Wildes, Clerk, West Malling.

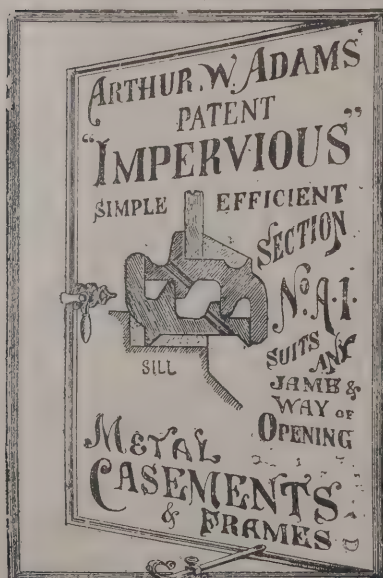
WEST STANLEY.—Jan. 8.—For Additions to Board School. Mr. J. W. Rounthwaite, Architect, 13 Mosley Street, Newcastle-on-Tyne.

YORK.—Jan. 4.—For Erection of Auction Ring and Rostrum, at Cattle Market. Mr. A. Creer, City Engineer, Guildhall, York.

THE Hereford City Council have decided to purchase premises in Broad Street for the establishment of a hop market. The site and buildings would cost 4,000*l.*, and the total expenditure would be 5,500*l.* Accommodation for the storage of about 3,500 pockets of hops would be provided, and the scheme also includes the necessary offices for the merchants.



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TENDERS FOR THE YEAR 1894.

THE following are a few of the more important works that were estimated for during 1894, and which appeared in our columns last year:—

BELFAST.

For Erection of the New National Bank and Manager's Residence. Mr. WILLIAM BATT, Architect, Royal Avenue, Belfast. Quantities by Mr. S. C. HUNTER, Surveyor.

John Smith, Belfast	£16,079	0	0
Robert Corry, Belfast	15,000	0	0
W. J. Campbell & Son, Belfast	14,950	0	0
H. & J. MARTIN, Lim., Belfast (accepted)	14,235	0	0

BIRMINGHAM.

For Erection of New General Hospital, according to Amended Plans. Mr. W. HENMAN, Architect. Quantities prepared jointly by Mr. T. H. MANSELL, Birmingham, and Mr. CHARLES HENMAN, London.

W. & J. Webb, Birmingham	£129,735	0	0
Parnell & Son, Rugby	125,154	0	0
Surman & Sons, Birmingham	123,990	0	0
Neil & Son, Manchester	123,920	0	0
Walker & Slater, Derby	122,541	0	0
H. Lovatt, Wolverhampton	121,891	0	0
Sapcote & Son, Birmingham	121,818	0	0
John Bowen, Birmingham	118,652	0	0
BARNSELY & SONS, Birmingham (accepted)	117,888	0	0

BRIGHTON.

For Execution of Works in the Borough, for the Council. Mr. FRANCIS J. C. MAY, C.E., Borough Surveyor.

Concrete Groyne, Storm-water Outlet, &c., Western Street.

S. & E. Bentley, Leicester	£19,934	0	0
S. Pearson & Son, Westminster	12,700	0	0
Pethick Bros., Plymouth	9,944	0	0
A. Kellett, Willesden	9,436	0	0
Wilkinson Bros., London	9,000	0	0
V. P. Freeman, Brighton	8,820	0	0
Playfair & Toole, Southampton	7,547	0	0
J. Longley & Co., Crawley	7,459	0	0
G. Lawson, Glasgow	6,530	0	0
B. COOKE & Co., Battersea (accepted)	5,900	0	0
J. Dickson, St. Albans	4,707	10	2

BRIGHTON—continued.

Storm-water Outlet, and Additions to Groyne, Old Steyne.

S. & E. Bentley	£19,491	0	0
S. Pearson & Son	12,800	0	0
Wilkinson Bros.	11,500	0	0
Pethick Bros.	9,954	0	0
V. P. Freeman	9,520	0	0
A. Kellett	8,992	0	0
J. Longley & Co.	7,789	0	0
J. Dickson	7,271	11	5
Playfair & Toole	7,164	0	0
B. COOKE & Co. (accepted)	6,500	0	0
G. Lawson	6,400	0	0

Brick and Pipe Sewers.

Pethick Bros.	37,644	0	0
S. & E. Bentley	35,362	0	0
S. Pearson & Son	35,000	0	0
G. Lawson	33,925	0	0
J. Longley & Co.	29,875	0	0
A. Kellett	28,540	0	0
Wilkinson Bros.	27,470	0	0
J. Dickson	26,429	0	0
Playfair & Toole	23,800	0	0
B. COOKE & Co. (accepted)	21,477	0	0

BUXTON.

For Construction of Storage Water Reservoir, for the Buxton Local Board. Mr. JOSEPH HAGUE, Engineer, Town Hall, Buxton.

J. Tomlinson, Derby	£20,177	14	11
G. Lawson & Sons, Edinburgh	19,510	0	0
C. J. Wills, Manchester	16,813	10	5
E. Tempest, Matlock Bridge	16,280	0	0
J. Dickson, St. Albans	15,488	0	0
A. Gall, Malvern Wells	15,436	0	0
J. & T. Young, Baildon	15,221	17	9
J. Salt, Buxton	14,810	4	0
J. Moffatt, Manchester	14,643	7	7
S. & W. Pattinson, Sleaford	14,428	2	5
B. Graham & Son, Huddersfield	13,872	0	0
Dix & Co., Morrisbrook	13,775	6	2
T. A. Matthews, Buxton	13,717	13	9
NAYLOR BROS., Buxton (accepted)	13,139	1	3
Surveyor's estimate.	13,870	12	6

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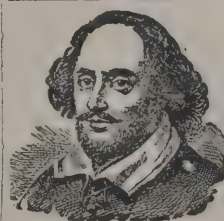
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For Building Casual Wards, St. Leonard Street, Bromley, Middlesex. Messrs. WALTER A. HILLS & SON, Architects. Quantities by Mr. HENRY POSTON, F.S.I.			
J. Holland, Bromley	£13,185	0	0
W. Watson, Ilford	13,180	0	0
B. E. Nightingale, Albert Embankment.	12,939	0	0
F. J. Coxhead, Leytonstone	12,787	0	0
W. Shurmur, Clapton	12,780	0	0
W. Maddison, Canning Town	12,739	0	0
Harris & Wardrop, Limehouse	12,469	0	0
Mowlem & Co., Westminster.	12,293	0	0
Architects' estimate	12,500	0	0

For Building Board Schools, Wharton Road, Bromley, Kent, to Accommodate 1,066 Children, for the Bromley School Board. Mr. CHARLES BELL, F.R.I.B.A., Architect, 3 Salters' Hall Court, Cannon Street, E.C. Quantities by Messrs. C. STANGER & SON, 21 Finsbury Pavement, E.C.

D. Payne	£11,667	0	0
F. P. Duthort	10,747	0	0
W. A. Sruhb	10,688	0	0
R. A. Lowe	10,552	0	0
T. Crossley & Son	10,414	0	0
T. D. Sraty	10,363	0	0
ARNAUD & SONS (accepted)	10,242	0	0
Architect's estimate	10,502	0	0

CARDIFF.

For Reconstruction of Guildford Crescent Baths, for the Corporation. Mr. W. HARPUR, Borough Engineer.

W. Thomas & Co.	£14,550	I	2
S. Shepton & Son	14,526	II	7
H. Gibbon	14,504	0	0
Jones Bros.	13,550	0	0
Lattey & Co.	13,450	0	0
J. Gibson	13,367	12	6
Turner & Sons	13,288	0	0
J. Thomas	12,965	0	0
H. Davies	12,641	4	4
D. Davies	12,641	0	0
J. Allan	12,411	0	0
W. SYMONDS & CO. (accepted)	12,359	19	3
Engineer's estimate	12,590	17	0

CARDIFF—continued.

For the Erection of a New Biscuit Factory and Warehouses at Cardiff, for Messrs. Spillers Nephews' Biscuit Company, Limited. Messrs. VEALL & SANT, Architects, Cardiff. Quantities by the Architects.

Price & Wills, Barry Dock (15 months)	£24,201	0	0
W. Thomas & Co., Cardiff (12 months)	23,054	0	0
Stephens, Bastow & Co., Bristol (12 months)	22,879	0	0
Shepton & Son, Cardiff (24 months)	22,618	0	0
Hatherley & Carr, Bristol (11 months)	22,375	0	0
Lattey & Co., Cardiff (10 months)*	21,750	0	0
Knox & Wells, Cardiff (11 months)	21,300	0	0
H. Willcock & Co., Wolverhampton (12 months)	21,140	0	0
James Allan, Cardiff (15 months)	20,955	0	0
C. C. Dunn, Cardiff (12 months)	20,940	0	0
H. Gibbon, Cardiff (12 months)	20,404	0	0
G. H. Wilkins, Bristol (9 months)	20,110	0	0
W. Symonds & Co., Cardiff (12 months) (accepted)	19,637	0	0

* Or in 7 months, £25,000.

CHRISTCHURCH.

For Men's Quarters and Cottage Homes at Workhouse, for the Christchurch Guardians. Mr. E. BURTON, Architect, Bournemouth.

A. King, Gloucester	£12,974	0	0
F. Hoare, Bournemouth	12,679	0	0
George & Harding, Bournemouth	12,524	0	0
Lucas, Bournemouth	12,027	0	0
M'William, Bournemouth	11,992	0	0
Jones, Bournemouth	11,370	0	0
Jenkins & Sons, Bournemouth	10,847	0	0
W. J. CHINCHEN, East Cliff Works, Bournemouth (accepted)	10,500	0	0

COLCHESTER.

For Building Schools in Barrack Street, Colchester, for the Colchester School Board. Messrs. GOODEY & CRESSALL, Architects, Victoria Chambers, Colchester.

Girling & Coe, Ipswich	£14,495	0	0
F. Dupont, Colchester	13,760	0	0
R. Beaumont, Colchester	13,670	0	0
W. A. Chambers, Colchester	13,598	0	0
G. Dobson, Colchester	13,500	0	0
C. E. Orfeur, Colchester	13,489	0	0
EVERETT & SON, Colchester (accepted)	13,120	0	0

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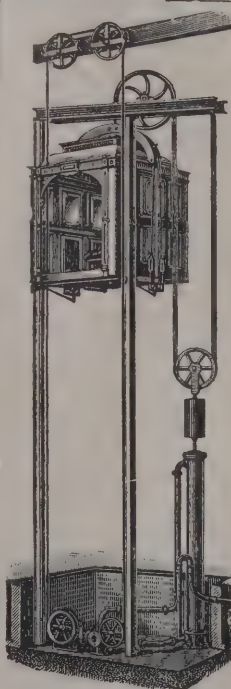
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T. Adams, London	5,871	18	0
T. Cuthbert, Hyson Green, Nottingham	5,827	0	0
J. Dickson, St. Albans	5,739	0	0
H. Weldon, Birmingham	5,668	0	0
H. Vickers, Nottingham	5,575	0	0
D. Barry, Nottingham	5,560	10	6
Jones & Fitzmaurice, Birmingham	5,553	17	0
B. Cooke & Co., Battersea	5,379	0	0
J. Tomlinson, Derby	5,308	5	6
J. H. Vickers, Nottingham	5,190	0	0
T. SMART, Nottingham (<i>accepted</i>)	5,013	10	0
Engineer's estimate	5,060	0	0

Contract No. 2.

J. F. Price	21,332	12	0
T. Adams	18,852	9	9
Jones & Fitzmaurice	18,051	13	8
W. Jenkins & Son, Leamington	17,756	0	0
B. Cooke & Co.	17,735	0	0
J. Tomlinson	17,268	0	0
J. Dickson	17,249	0	0
J. Bond	16,850	0	0
J. Bradley, Lincoln	15,658	14	5
J. H. Vickers	15,600	0	0
D. Barry	15,485	6	0
T. Smart	15,429	10	0
H. Weldon	15,359	0	0
COPE & RAYNOR, Lenton (<i>accepted</i>)	14,447	1	0
H. Vickers	14,360	0	0
T. Cuthbert	14,234	0	0
J. Hawley & Son, Ilkeston (<i>withdrawn</i>)	13,683	16	9
Engineer's estimate	14,400	0	0

CLACTON-ON-SEA.

For Building Convalescent Home at Clacton-on-Sea, for the Weekly Board of the Middlesex Hospital. Messrs. RUAULT & YOUNG, Architects, 17 Southampton Street, Bloomsbury, W.C.

J. Grimes, North Gate Works, Colchester	£20,500	0	0
L. H. & R. Roberts, 34 Rheidol Terrace, Islington	20,144	0	0
Ellis & Turner, 90 Aldersgate Street, E.C.	19,950	0	0
H. J. Linzell, Newmarket	19,579	0	0
H. Runnacles, Halstead	19,330	0	0
Girling & Co., Crown Street, Ipswich	19,240	0	0
E. West, Fairfield Works, Chelmsford	19,200	0	0
W. Chambers, Magdalen Street, Colchester	18,989	0	0
Everett & Son, Hythe Hill, Colchester	18,475	0	0

GLASGOW.

For Taking-down and Rebuilding Glasgow Bridge, Jamaica Street.

James Young, British granite	£116,859	16	6
James Young, foreign granite	112,832	2	6
John Paterson & Son, British granite	114,135	7	8
John Paterson & Son, foreign granite	112,167	13	10
Charles Brand & Son, British granite	105,272	13	0
Charles Brand & Son, foreign granite	103,135	9	0
James Goldie & Son, British granite	93,588	2	2
James Goldie & Son, foreign granite	91,896	16	8
Morrison & Mason, British granite	81,176	5	0
Morrison & Mason, foreign granite	81,176	5	0
George Lawson & Son, British granite	78,000	0	0
George Lawson & Son, British granite	76,000	0	0

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For Construction of Contributory Drainage North and South of River Wey.

Wilkinson Bros.	£24,600	0	0
J. Neave	22,592	0	0
T. Adams	21,400	0	0
J. Dickson	21,127	0	0
B. Cooke & Co.	20,900	0	0
G. Osenton	20,357	0	0
W. Cunliffe	20,095	0	0
J. JACKSON, Plaistow (<i>accepted</i>)	20,200	0	0

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Mr. J. B. EVERARD, Engineer, 6 Millstone Lane, Leicester.			
Morrison & Mason, Glasgow	£189,555	11	4
Kirk, Knight & Co., Sleaford	177,549	0	0
Whitaker Bros., Limited, Horsforth, Leeds	158,333	7	2
Pethick Bros., Plymouth	155,767	0	0
Bentley & Tempest, Leicester	152,499	0	0
A. Gall, Malvern Wells	139,546	5	9
Wait & Wilson, Glasgow	134,086	19	11
J. AIRD & SONS, London (accepted)	133,511	0	0

LONDON.

For Construction of the Waterloo and City Railway.			
Parry & Co.	£445,829	0	0
Pauling & Elliott	328,114	0	0
Pearson & Co.	253,170	0	0
W. Scott & Co.	245,555	0	0
J. T. Firbank	245,184	0	0
Price & Willis	230,835	0	0
J. MOWLEM & CO. (accepted)	229,064	0	0

For New Premises at Backchurch Lane, Whitechapel, for
Messrs. Kinloch & Co. Mr. H. H. COLLINS, Architect.

Paramor	£26,663	0	0
Sparks	26,296	0	0
Holland & Hannen	26,190	0	0
Grimwood	26,120	0	0
Clarke & Bracey	26,000	0	0
Mowlem & Burt	25,929	0	0
T. Rider & Son	25,838	0	0
T. Boyce	25,800	0	0
Foster & Dicksee	25,789	0	0
Colls & Sons	25,480	0	0
W. Downs	25,480	0	0
Lascalles & Co.	25,470	0	0
W. Shurmur	25,380	0	0
Ashby & Horner	25,265	0	0
F. & F. J. Higgs	24,873	0	0
Lovatt	24,853	0	0
Lawrance & Co.	24,369	0	0
Patman & Fotheringham	24,171	0	0
J. & J. Greenwood	22,860	0	0

LONDON—continued.

For Erection of Northern Polytechnic Institute, Islington.
Mr. CHARLES BELL, F.R.I.B.A., Architect. Quantities
by Mr. C. G. ROBERTS.

Woodward & Co.	£34,612	0	0
Dove Bros.	33,155	0	0
W. & H. Castle	32,357	0	0
Lown & Sons	32,182	0	0
C. Dearing & Son	31,370	0	0
Chas. Wall	31,200	0	0
Mattock Bros.	31,131	0	0
Lawrance & Sons	30,880	0	0
G. S. Williams & Son	30,643	0	0
Howell J. Williams	30,287	0	0
Wm. Goodman	30,233	0	0
J. Grover & Sons	30,202	0	0
MACFARLANE BROS. (accepted)	29,722	0	0

For Building Board School on the Site in Hungerford Road,
Islington, to Provide Accommodation for 1,174 Children,
with Laundry and Manual Training Centres. Mr. T. J.
BAILEY, Architect.

Foster & Dicksee	£22,155	0	0
T. L. Green	20,792	0	0
Killby & Gayford	20,559	0	0
S. & W. Pattinson	20,450	0	0
W. Goodman	20,332	0	0
H. Lovatt	20,130	0	0
E. Lawrance & Sons	19,965	0	0
J. Grover & Son	19,888	0	0
C. Cox	19,505	0	0

For New Avenue, for Mr. Joseph Carter Wood, on the Ancient
and Historical Site in Westminster which during the past
century has been known as the Artillery Brewery, Victoria
Street, Westminster. Mr. JOHN CALDER, Architect.
Quantities by Mr. EDWARD CRUTCHLOE, the Albert
Chambers, Victoria Street, S.W.

Foster & Dicksee	£22,330	0	0
J. Norris & Sons	21,224	0	0
Killby & Gayford	19,227	0	0
G. Trollope & Sons	18,974	0	0
S. & W. Pattinson	18,873	0	0
Dove Brothers	18,810	0	0
Holloway Brothers	18,640	0	0
W. KING & SON (accepted)	16,900	0	0

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E. Lawrance & Sons	£21,399	0	0
T. L. Green	21,250	0	0
S. J. Jerrard	20,990	0	0
J. Marsland	20,966	0	0
Lathey Bros.	20,931	0	0
W. Downs	19,964	0	0

For Building Block of Flats and Shops, North House, 5, 6 and 7 Sloane Street, Belgravia. Mr. ALFRED J. BEST, Architect, 17 Sloane Street, S.W. Quantities by Messrs. D. CAMPBELL & SON, 69 Finsbury Pavement, E.C.

S. J. Jerrard	£23,600	0	0
Mowlem & Co.	25,000	0	0
Foster & Dicksee	24,374	0	0
Shillitoe	23,850	0	0
Lathey Bros.	23,527	0	0
Holliday & Greenwood	23,333	0	0
Boyce	22,840	0	0
Nightingale	22,835	0	0
Johnson & Co.	22,700	0	0
Perry & Co.	22,462	0	0
L. H. Holloway	22,377	0	0
Holloway Bros.	21,972	0	0

For Building New Warehouse, for Messrs. Bowman Bros., at High Street, Camden Town. Mr. J. M. KENNARD, Architect.

Killby & Gayford	£13,760	0	0
Colls & Sons	13,687	0	0
Holliday & Greenwood	13,573	0	0
Holloway Bros.	13,500	0	0
Scrivener & Co.	13,494	0	0
Fatman & Fotheringham	13,171	0	0
Toms	13,111	0	0
H. J. Williams	12,987	0	0
J. Allen & Sons	12,964	0	0
Gould & Brand	12,745	0	0
Shepherd	12,628	0	0
S. R. Lamble	12,329	0	0

LONDON—continued.

For Building Infirmary at Isleworth, for Guardians of Poor. Mr. W. H. WARD, Architect, Paradise Street, Birmingham. Mr. FRANCIS MILLER, Quantity Surveyor, 10 Delahay Street, Westminster.

G. Carr, Sheffield	£48,050	0	0	Amended Tender.
J. T. Collinson, Teddington	45,350	0	0	£39,150
Shillitoe & Sons, Bury St. Edmunds.	44,600	0	0	36,750
B. E. Nightingale, London.	42,543	0	0	33,328
Wilkinson Bros., Finsbury Park	41,649	0	0	33,253
F. & H. F. Higgs, Loughborough Junction	41,620	0	0	34,154
W. Watson, Ilford	39,950	0	0	32,620
Willcock & Co., Wolverhampton	39,885	0	0	31,563
C. G. Hill, Coventry	39,350	0	0	32,193
T. Nye, Ealing	39,335	0	0	32,524
Godson & Sons, Kilburn	39,281	0	0	32,175
W. & J. Well, Birmingham	39,038	0	0	31,824
W. Robinson, Birmingham	38,317	0	0	31,469
R. W. Pattison, Whitehall	37,765	0	0	30,979
Dorey & Co., Brentford	37,408	0	0	30,216
Garlick & Horton, Chelsea	36,619	0	0	29,736
T. J. MESSUM, Twickenham (accepted)	36,069	0	0	29,874

For Building New Police Station at Holms Road, N.W. Mr. R. NORMAN SHAW, R.A., Architect. Quantities by Messrs. FRANKLIN & ANDREWS.

Willmott & Son	£14,350	0	0
Ansell	14,167	0	0
Grover & Son	14,100	0	0
Higgs & Hill	13,992	0	0
Lathey	13,980	0	0
Downs	13,590	0	0
J. O. Richardson	13,498	0	0
Boyd	13,470	0	0
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Roberts	15,134	o	o
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DEARING & SON (accepted)	14,491	o	o

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J. Mackay, Newport	24,494	o	o
Cooke & Co., London	24,229	o	o
Lloyd & Powell, Bristol	23,733	17	6
Love & Wait, Bristol	23,650	o	o
J. Linton, Newport	22,400	o	o
Tree & Son, Bristol	22,006	o	o
G. Osenton, London	21,969	o	o
H. Hill, Maidenhead	20,124	o	o
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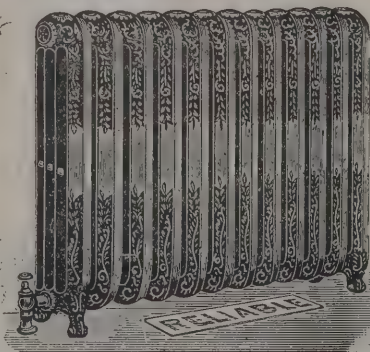
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J. C. Hope, Newcastle	16,352	0	0
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W. Christie, South Shields	16,125	0	0
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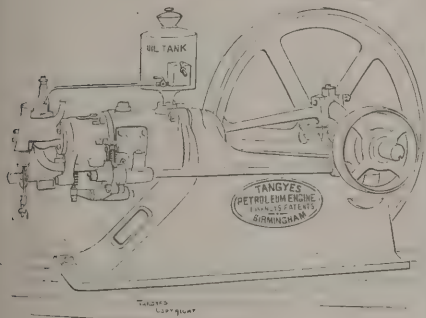
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Earl & Briggs, Derby	25,493	4	7
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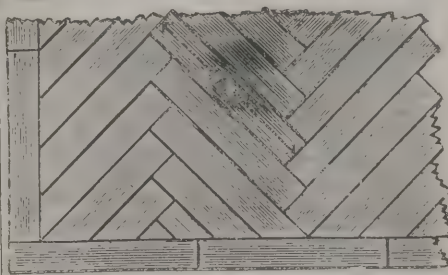
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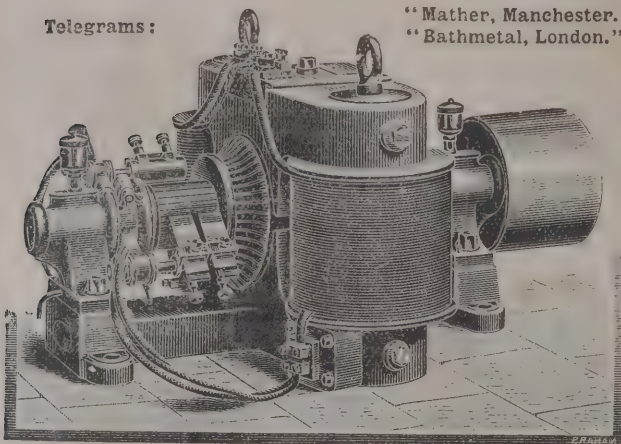
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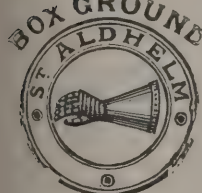
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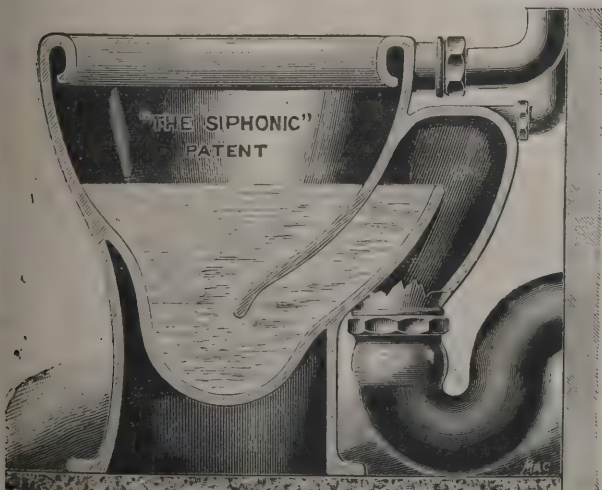
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BOURNEMOUTH—continued.

For Making New Road to the Meyrick Park and Golf Links, for the Bournemouth Town Council. Mr. F. W. LACEY, Surveyor, Bournemouth.

W. H. SAUNDERS & CO., Bournemouth (accepted) £153 0 0

COLERAINE.

For Construction of Water and Sewerage Works, Portstewart, for the Guardians of Coleraine Union.

M. GREEN, 244 York Street, Belfast (accepted) £2,309 2 11

DUDLEY.

For Building Board Schools, Eve Hill, Dudley. Mr. ROBERT F. MATTHEWS, Architect, 35 Paradise Street, Birmingham. Quantities by Architect.

Bishop & Sons	£9,500	0	0
Marsh Bros., Pensnett, Dudley	8,130	0	0
Merton Hughes, Birmingham	7,721	0	0
Dorse & Co., Cradley Heath	7,600	0	0
H. Golding, Netherton	7,580	0	0
Henry Gough, Wolverhampton	7,395	0	0
G. H. Marshall, Smethwick	7,387	0	0
Webb & Round, Dudley	7,350	0	0
John Guest & Sons, Stourbridge	7,300	0	0
William Willetts, Old Hill	7,287	0	0
T. Rowbotham, Birmingham	7,250	0	0
R. Fenwick, Birmingham	7,225	0	0
Lane Bros., Birmingham	7,077	0	0
Harley & Sons, Smethwick	7,075	0	0
Whittaker & Co., Dudley	7,060	0	0
John Dallow, Blackheath	6,950	0	0
Crisp & Co., Dudley	6,750	0	0
J. JONES & SONS, Sedgley (accepted)	6,590	0	0

EAST HAM.

For Additions to Schools in High Street, for the School Board.

SHARP (accepted) £1,019 0 0

EXMOUTH.

For Construction of Stoneware Pipe Sewers at the Point and Ferry Road, Exmouth. Mr. W. H. BESWICK, Surveyor.

S. Sanders, Gloucester	£733	13	4
Hooper & Stooke, Exmouth	602	1	7
W. H. SAUNDERS & CO., Bournemouth (accepted)	581	10	0

GREAT YARMOUTH.

For Building Shops and Residences, Regent Road, Great Yarmouth. Mr. CHAS. G. BAKER, Architect, Town Hall Chambers, Great Yarmouth. Quantities by Architect.

Bray, Great Yarmouth	£1,448	0	0
Curtis & Read, Great Yarmouth	1,447	0	0
Harrod, Great Yarmouth	1,435	0	0
Carter & Wright, Great Yarmouth	1,420	0	0
Balls, Great Yarmouth	1,420	0	0
Flaxman, Southtown	1,419	0	0
Bond, Great Yarmouth	1,416	0	0
Grimble, Great Yarmouth	1,328	0	0
Ward, Southtown	1,323	0	0
BECKETT, Southtown (accepted)	1,320	0	0
Architect's estimate	1,400	0	0

HAYWARD'S HEATH.

For Works at East Sussex County Lunatic Asylum, Hayward's Heath. Mr. HENRY CARD, County Surveyor.

Alterations, &c. to Mortuary.

J. R. Hunt, Hayward's Heath	£158	0	0
P. PETERS, Horsham (accepted)	141	0	0

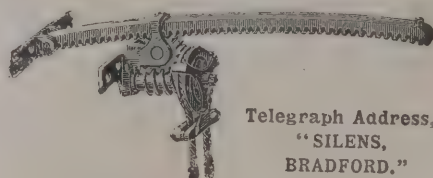
*Alterations to Drains.**As per Schedule of Prices.*

Bostel Bros., Brighton	10 per cent. above schedule prices.
H. J. Smith, Maidstone	9 " " "
Wm. Piper, Hastings	5 " " "
J. R. Hunt, Hayward's Heath	Net at schedule prices.
P. PETERS, Horsham (accepted)	5 below " "

HIGHCLIFFE.

For New Stabling at Globe Hotel, Highcliffe, near Christchurch, for Mr. J. Shuttleworth. Messrs. LAWSON & DONKIN, Architects, Bournemouth.

F. J. Luxton, Ottery St. Mary, Devon	£533	0	0
George & Harding, Bournemouth	499	0	0
W. Hoare, Bournemouth	476	0	0
M'William & Sons, Bournemouth	475	0	0
W. Howe, Christchurch	460	15	6
Entwistle & Cox, Bournemouth	456	0	0
G. Pope, Christchurch	455	13	6
W. J. Lucas, Bournemouth	449	0	0
W. J. Chinchin, East Cliff Works, Bournemouth	440	0	0
Frampton & Son, Highcliffe	410	0	0

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Musson, Radford, Nottingham	1s. 9d.	"
Knighton, Ilkeston	1s. 6d.	"
Fouldes, Ilkeston	1s. 5d.	"
Alderson & Stevenson, Nottingham	1s. 4d.	"
POUNDER, Nottingham (accepted)	1s. 3d.	"

HOUNSLOW.

For Making-up and Sewering Worpel Road, Talbot Road, Napier Road, Steele Road, Eve Road and Honeywood Road, for the Heston and Isleworth Local Board. Mr. J. H. STRACHAN, Surveyor.

Jackaman & Son, Slough	£5,632	12	0
Fry Bros., Greenwich	5,610	11	10
J. Ball, Chiswick	4,876	8	11
Wimpey & Co., Hammersmith	4,724	9	3
J. Jackson, Plaistow	4,684	0	0
G. Bell, Tottenham	4,595	18	6
T. Adams, Wood Green	4,500	6	6
Mowlem & Co., Westminster	4,215	0	0
S. Hudson, Streatham Hill	4,118	11	7
R. Ballard, Child's Hill	4,083	8	7
W. H. WHEELER, Southwark (accepted)	4,019	2	4
Surveyor's estimate	4,125	0	0

For Making-up and Sewering Haliburton Road, Northcote Road, Newry Road and Heron Road, for the Heston and Isleworth Local Board. Mr. J. H. STRACHAN, Surveyor.

Jackaman & Son, Slough	£4,288	0	0
Fry Bros., Greenwich	4,054	3	11
J. Ball, Chiswick	3,538	6	7
T. Adams, Wood Green	3,354	3	2
J. E. Broderick, Richmond	3,334	18	8
J. Jackson, Plaistow	3,305	0	0
G. Bell, Tottenham	3,222	4	0
Wimpey & Co., Hammersmith	3,192	11	0
S. Hudson, Streatham Hill	3,103	0	0
Mowlem & Co., Westminster	3,101	0	0
R. Ballard, Child's Hill	2,975	9	2
W. H. WHEELER, Southwark (accepted)	2,760	7	6
Surveyor's estimate	2,920	0	0

HOUNSLOW—continued.

For Making-up and Sewering Holloway Road, Prince Regent's Road, Star Road, Temple Road, Upton Road, Anderson's Place and Gordon Road, for the Heston and Isleworth Local Board. Mr. J. H. STRACHAN, Surveyor.

Jackaman & Son, Slough	£4,039	0	0
Fry Bros., Greenwich	3,788	6	5
J. Ball, Chiswick	3,546	0	0
G. Bell, Tottenham	3,363	2	10
R. Ballard, Child's Hill	3,306	19	10
T. Adams, Wood Green	3,294	15	3
J. Jackson, Plaistow	3,167	0	0
Mowlem & Co., Westminster	3,115	0	0
S. HUDSON, Streatham Hill (accepted)	3,052	5	0
Surveyor's estimate	3,200	0	0

For Making-up and Sewering Bulstrode Road, Montague Road, Queen's Road and York Road, for the Heston and Isleworth Local Board. Mr. J. H. STRACHAN, Surveyor.

Jackaman & Son, Slough	£4,557	14	0
Fry Bros., Greenwich	3,876	15	3
Wimpey & Co., Hammersmith	3,719	9	9
J. Jackson, Plaistow	3,665	0	0
G. Bell, Tottenham	3,541	3	1
T. Adams, Wood Green	3,540	18	1
Mowlem & Co., Westminster	3,411	0	0
S. Hudson, Streatham Hill	3,393	19	10
R. Ballard, Child's Hill	3,313	1	11
J. BALL, Chiswick (accepted)	3,154	3	1
Surveyor's estimate	3,325	0	0

MARKET HARBOROUGH.

For Construction of New Street, 200 Yards in Length (called Nithsdale Avenue), Little Market Harborough, for Mr. J. W. Newcombe. Mr. HERBERT G. COALES, Surveyor.

J. E. Tate, Uppingham	£717	19	0
J. H. Vickers, Nottingham	472	19	4
F. Barlow, Rothwell	423	0	0
W. H. Hall, Rugby	416	18	6
J. Holme, Leicester	416	16	8
J. Smith, Little Bowden	403	15	0
A. JEWELL, Little Bowden (accepted)	360	0	0

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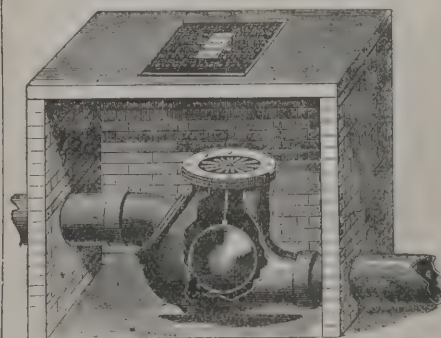
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PROOFS of this Illustration, which appeared in "The Architect" on June 6, 1885 (now out of print), can be obtained on application to the Publisher, price Sixpence each, post free; on roller, Ninepence.

HORNSEY.

For 100 Cast-iron Gully Tanks, for the Hornsey District Council. Mr. E. J. LOVEGROVE, Engineer.	
Safety Tread Co., Barbican	£3 19 0
J. Hall & Son, Gillingham, Kent	3 14 0
Wood's Patent Engine Co., Stockwith-on-Trent	3 2 0
Weeks & Son, Maidstone	3 0 0
Cartwright Mead, Bishopsgate Street	2 19 0
Falkirk Iron Co., Upper Thames Street	2 16 6
S. Lund, Keighley	2 16 6
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J. Mackerell, Elland	2 12 6
W. Allen, Dipton	2 11 6
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Clapham Bros., Keighley	2 4 9
Tees Side and Engine Works Co., Cannon Street	2 4 0
Newton, Chambers & Co., Westminster	2 2 0
Richards & Sons, Leicester	2 1 6
Swinden & Co., Walbrook	2 1 0
Daniel Clark, Carlisle	2 0 0
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Hollom & Co., Gracechurch Street	1 17 0
Collis & Stace, Rochester	1 16 9
J. C. & J. S. Ellis, Sheffield	1 16 6
F. MORETON & Co., Westminster (accepted)	1 11 10

LONDON.

For Partially Pulling-down and Rebuilding Nos. 22 and 24 London Street, Fitzroy Square. Mr. J. RANDALL VINING, Architect and Surveyor, 89 Chancery Lane, W.C.	
Dove & Beveridge	£280 10 0

LONDON—continued.

For Partially Pulling-down and Rebuilding Nos. 94 and 96 Whitfield Street, Fitzroy Square. Mr. J. RANDALL VINING, Architect and Surveyor, 89 Chancery Lane, W.C.	
Dove & Beveridge	£289 0 0
J. & C. BOWYER (accepted)	289 0 0
For Repairs to No. 12 London Street, Fitzroy Square.	
Dove & Beveridge	£68 5 0
W. Catchpole	61 14 0
J. & C. BOWYER (accepted)	47 10 0
For Partially Pulling-down and Rebuilding No. 175 Tottenham Court Road, W. Mr. J. RANDALL VINING, Architect and Surveyor, 89 Chancery Lane, W.C.	
F. Pitcher	£509 0 0
W. Johnson & Co.	460 0 0
A. Black & Son	450 0 0
Dove & Beveridge	448 0 0
H. L. Holloway	425 0 0
J. & C. BOWYER (accepted)	390 0 0
For Partially Pulling-down and Rebuilding No. 26 Fitzroy Street, and 26 London Street, Fitzroy Square. Mr. J. RANDALL VINING, Architect and Surveyor, 89 Chancery Lane, W.C.	
H. L. Holloway	£475 0 0
DOVE & BEVERIDGE (accepted)	425 0 0
For Partially Pulling-down and Rebuilding No. 112 Whitfield Street, Fitzroy Square. Mr. J. RANDALL VINING, Architect and Surveyor, 89 Chancery Lane, W.C.	
Dove & Beveridge	£176 5 0
For Alterations and Additions to Headquarters, Tower Hamlets Rifle Brigade. Professor BANISTER FLETCHER, Architect.	
Mowlem & Co.	£2,393 0 0
H. J. Williams	1,987 0 0
Perry & Co.	1,977 0 0
Colls & Sons	1,945 0 0
Burman	1,883 0 0
W. SHEPHERD (accepted)	1,873 0 0
For Rebuilding of 85, 86 and 87 Lower Thames Street, E.C., at Corner of St. Dunstan's Hill. Mr. DELISSA JOSEPH, F.R.I.B.A., Architect, 17 and 18 Basinghall Street, E.C.	
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LONDON—continued.

For Making-up Marlborough Road, Bowes Park, N., prior to its Adoption by the Wood Green Local Board, for the National Land Corporation, Limited. Messrs. POOLEY & FOLLETT, Surveyors, 21 John Street, Adelphi, W.C.

S. Chafen, Deptford	£1,550	0	0
B. Milward, Harringay	952	0	0
T. Adams, Wood Green	900	0	0
S. Kavanagh, Surbiton	875	0	0
W. Nicholls, Wood Green	850	0	0
W. Griffiths, Kingsland	849	0	0

These Tenders are still under consideration.

NEW FERRY.

For Construction of Pipe Sewer, with Manholes, &c., Woodhead Street, for the Lower Bebington Local Board. Mr. J. YOUNG, Surveyor.

P. Gaven, 6 Pym Street, Birkenhead	£84	13	6
T. Myers, 33 Bedford Road, Rock Ferry	79	13	0
J. Barnes, The Village, Bebington	77	14	0
A. HARRIS, Upton (accepted)	72	10	0

NEW SWINDON.

For Building Technical Schools, for the New Swindon Local Board.

LONG & SON, Bath (accepted)	£9,552	13	11
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PEMBROKE.

For Additional Classrooms, &c., to School Buildings, East End, Pembroke, for the Pembroke School Board. Mr. JOHN E. P. LADD, Architect, Main Street, Pembroke.

J. R. Thomas, Pembroke Dock	£694	16	0
C. Young, Pembroke Dock	647	0	0
DAVIS & MORGAN, Pembroke (accepted)	575	0	0

RAWMARSH.

For Construction of Two New Streets at Ryecroft, Main Street and South Street, for the Rawmarsh Local Board.

South Street.

R. Morton, Parkgate	£398	15	0
B. BOOL, Parkgate (accepted)	385	6	10

Main Street.

R. Morton	377	18	1
B. BOOL (accepted)	371	8	10

SHAWFORD.

For Manufacturing, Erecting and Setting to Work Additional Softening and Filtering Plant and Machinery at the Otterbourne Waterworks, near Shawford, for the Corporation. Mr. W. MATTHEWS, Waterworks Engineer.

Union Works Company, Kidsgrave	£2,407	6	5
Phoenix Foundry Company, Derby	2,200	0	0
Blakeborough & Sons, Brighouse	2,100	0	0
J. CORBIANE, Barrhead (accepted)	1,875	0	0

WEST HAM.

For Supply of a 10-ton Steam Road Roller, for the West Ham Town Council. Mr. LEWIS ANGELL, Borough Engineer, Town Hall, Stratford.

Mann & Charlesworth, Leeds	£350	0	0
J. & H. MacLaren, Leeds	340	0	0
Wallis & Stevens, Limited, Basingstoke	300	0	0
AVELING & PORTER, Rochester (accepted)	300	0	0
J. Fowler & Co., Limited, Leeds	295	0	0
T. Green & Son, Limited, Blackfriars Road	295	0	0

A PORTRAIT WINDOW.

AN interesting window has been placed in the section of the National Portrait Gallery of Scotland devoted to the Museum of the Societies of Antiquaries of Scotland. It is the gift of Mr. J. R. Findlay to the Board of Manufactures, and commemorates the opening of the museum in the new building on August 13, 1891, on the occasion of the meeting in Scotland of the Royal Archæological Institute. The window, designed by Dr. Rowand Anderson, the Board's architect, and executed by Mr. W. G. Boss, contains portraits of the office-bearers of the Society at the date in question. Its position is at the top of the east staircase, and is readily seen from the landing which gives access to the council-room of the Antiquarian Society. It is divided into two lights, and the portrait medallions are arranged in sets of two on each side of the stone mullion. That of Her Majesty the Queen, the patroness of the Society, is inserted where, in ordinary circumstances, the tracery would

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be, between the points of the two arches. Below the arching of each light is a medallion—that on the left carrying the Royal Arms, while the right has the arms of the Society of Antiquaries of Scotland. The portraits come next in the following order:—On the left side, the Marquis of Lothian, K.T., LL.D. (president), and J. R. Findlay (vice-president); Sir Noel Paton, LL.D., R.S.A., and Sir W. Fettes Douglas (councillors); R. Rowand Anderson, LL.D., architect, and T. Dawson Brodie, W.S. (councillors), James Macdonald, LL.D. (councillor), and Dr. David Christison (secretary), Thomas Dickson, LL.D., and Sir Arthur Mitchell, K.C.B. (secretaries for foreign correspondence); Gilbert Goudie (treasurer), and Adam B. Richardson (curator of coins.) The portraits in the right-hand light, from the top downwards, are the Marquis of Bute and Sir Herbert Eustace Maxwell, Bart. (vice-presidents), Professor Sir William Turner, LL.D., and R. W. Cochrane Patrick, LL.D. (councillors), Aeneas J. G. Mackay, LL.D., and Reginald M'Leod (councillors); Dr. Robert Munro (secretary), and Joseph Anderson, LL.D. (assistant secretary); Robert Carfrae and Professor Duns, D.D. (curators), and John Taylor Brown (librarian). Balancing the medallion of Mr. Brown is one containing a female head with ears of wheat, symbolical of the period of the year when the museum was thrown open for the use of the public. It was on August 13, 1891, the date inscribed on the medallion, that this interesting ceremony took place. The portraits were done partly from photographs and partly from sittings given to Mr. Boss, and are all remarkably good likenesses of the noblemen and gentlemen represented. The heads are in glass of a silvery tint, set off by glass of a pretty shade of blue. Each head is enclosed in a circular floral wreath, with leaves and flowers of red berries; each wreath has a distinct design, and the whole of the coloured glass has a desirable purity and transparency of tint. The body of the window is of ordinary cathedral glass. The work involved in the preparation and mounting so many portraits was great, and had to be gone about with much care. In proof of this it may be noticed that in the medallion of the Queen alone there are over 200 pieces. The window forms an interesting memorial of an important event in the history of this national Society.

TENDERS are invited for an installation of electric light at the Guildhall, Bristol, by the City Electrical Engineer, Mr. Faraday Proctor, Temple Bank, Bristol.

ILLUSTRATIONS.

HISTORY OF CLOVIS.—NO. 1.—VOW ON BATTLE-FIELD OF TOLBIAC.

PRUDENTIAL ASSURANCE OFFICES, NOTTINGHAM.

NO. 40.—BERKELEY SQUARE.

ATHOLE HYDROPATHIC, PITLOCHRY.

VARIETIES.

At the meeting of the markets committee of the Leeds City Council it was decided, in view of the damage done by the late gale to the roof of the Kirkgate Market, to ask Mr. Hewson, the city engineer, to thoroughly examine the roof and report.

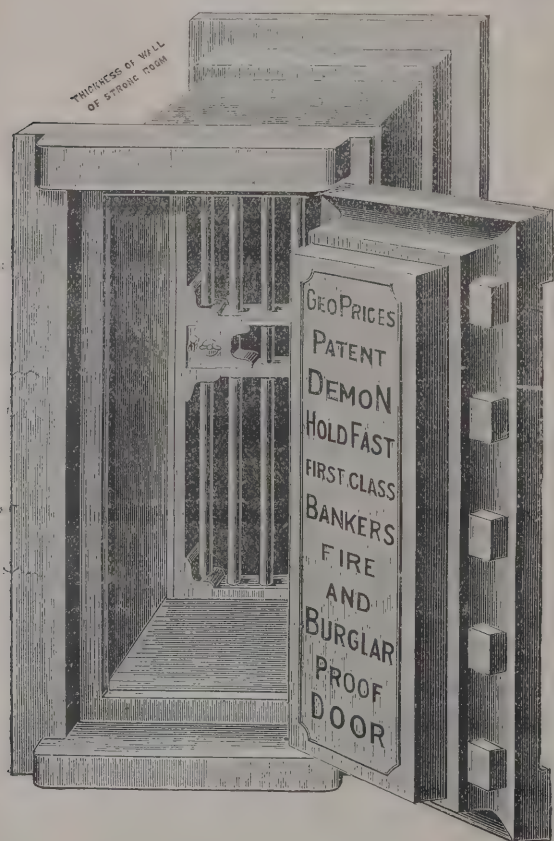
At the meeting of the Tendring School Board last week, Mr. J. W. Start, F.S.I., architect, of Colchester and Clacton-on-Sea, submitted plans for additions to the present school for ninety children, together with new offices, playgrounds, &c.

THE private Bills deposited this year amount to 170, of which number 138 relate to English undertakings, 16 to Scottish and 16 to Irish. Last year the number was 166.

INSTRUCTIONS have been given by the Cement Section of the London Chamber of Commerce to certain experts, who are not themselves cement manufacturers, to make exhaustive inquiries into the extent to which the introduction of Kentish rag and other materials into the manufacture of Portland cement may be found to prevail, and as to their effect on the quality of that article. These gentlemen have already commenced their investigations, the results of which they will report in due course as a basis for further action.

At the meeting of the Exeter City Council it was decided to apply for powers to borrow 42,000*l.* for sewage disposal purposes.

IN the dispute between Falkirk Town Council and Falkirk Joint-Stock Gas Company, Mr. Woodall, C.E., and Mr. Stevenson, C.E., London, the arbiters, have issued their award, giving the price to be paid by the Town Council for the undertaking of the Gas Company. Witnesses on behalf of the Gas



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New Gas and Water Offices, Dundee.

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&c., &c.

Company estimated the cost of the undertaking as high as 115,000*l.*, while witnesses for the Corporation estimated it as low as 33,000*l.* The arbiters fix the price at 77,050*l.*, to which sum falls to be added the expenses of the arbitration, the arbiters having decided that these should be borne by the Corporation.

The surveyor to the Malton Local Board, Mr. Richardson, has reported to that body in favour of an additional reservoir, and an additional well near the present reservoir, as a source of water supply for Malton. He also stated that the means recently taken to keep the water pure, by preventing contamination with flood water from the river Derwent, were calculated to be available for a flood up to 12 feet above the summer level.

The first cast has taken place at the recently erected Saltoun Iron Works, Falkirk, in presence of a large and representative gathering. These works, which belong to Mr. J. E. Gibson, late of Camelon Iron Company (Limited), are situated in Grahamston, in close proximity to Grahamston railway station, and the site is regarded as one of the best for an enterprise of the kind in the immediate neighbourhood of Falkirk. The works will afford employment for a large number of hands. Though at present only about two acres of ground are being utilised, nearly half of which is occupied by the buildings alone, more than double that space has been acquired for future extension.

The *Birmingham Post* says:—The total number of alarms of fires which the Birmingham fire brigade has attended during the past year has been 500, a decrease of 142 on the previous year. Of these 88 related to chimneys on fire, and 67 were false alarms. Of the 105 fires 7 were beyond the city boundary. The total loss is roughly estimated at 40,000*l.*, and the amount of property at risk at 1,700,000*l.* The most serious fire occurred on the premises of Messrs. Binley & Co., Smethwick, beyond the city boundary, and the next serious on the premises of Messrs. Heaven, Edgbaston Street.

The building of a new church of St. Paul at Auckland, New Zealand, is proposed, and an appeal for funds has been issued in this country.

The Great Western Railway Company, by a Bill deposited for consideration during the coming session, proposes to carry out a light railway by the conversion of the Lambourn Valley Railway, for which powers were granted in 1888, and which has not been constructed, into a tramroad. The line is to be subject to such conditions and restrictions as the Board

of Trade may impose; and for this and other works which are proposed in the Bill the company wishes to raise 300,000*l.* additional share capital, and to increase its borrowing powers by 100,000*l.*

At the Annual New Year Eisteddfod meeting at Dolgelly, Merioneth, Mr. Thomas Ellis, M.P., in his address said he desired to call attention to the crying need of attaining excellence in architecture. In many respects instrumental music and architecture were widely divergent in their method and appeal, but both arts were very similar in that they required patience, long training, devotion, an accumulated tradition of excellence, and those indefinable but priceless and indispensable gifts of touch and taste. In a word those two arts demanded, for their perfect development, genius. He hoped that Aberystwyth College would soon re-establish a department of music. Where to look for the training of men who could teach the erection of buildings which in their design bore the impress of the exercise of fine thought and high talent he did not know. But this he knew, that no country more sorely and urgently needed such teachers than Wales. All over Wales intermediate and technical schools were about to be built. Were they to be haphazard, ill-arranged, characterless and uninviting? Had Wales the architects and the popular taste and training which would model town and village, halls, institutes and libraries on something better than a gaol, a workhouse, or a barn? Year by year increasing numbers sought rest, leisure, recreation, natural beauty in the glens and along the seashores of Wales. But did the growing towns show traces of a characteristic and worthy Domestic architecture? Was there any serious endeavour to adapt farmhouses and cottages to character, to scenery, to climate, or to give to those buildings whose parts were determined by necessity such forms and colour as shall delight the mind? He ventured to think that that educational institution which seriously set itself to provide the Welsh people with guidance, knowledge and skill in the art of building well would receive the highest meed of praise and renown for distinguished service to the nation and dominion of Wales.

At Bangor an inquiry has been held by the Local Government Board in regard of an application for borrowing powers to carry out street improvements and sewerage works.

NEW Corporation stables, erected by Mr. James Wallace, builder, at a cost of about 3,000*l.*, have just been opened at Kilmarnock.



OETZMANN'S PATENT
WRITING TABLE.

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TRADE NOTES.

WE understand that great progress is being made with the Building Trades Exhibition, which opens at the Agricultural Hall in March next. Already the principal positions on the ground floor have been allotted, and several exhibitors have taken space in the galleries. The business character of the exhibition will be rigidly maintained, and there is every indication that the present year will see one of the best exhibitions of its kind.

WE have much pleasure in announcing that the Self-Lock Tile Company, of 49 Victoria Street, S.W., have just booked a large order for their patent tiles, nearly 3,000 feet, for the new premises of the Cork Pavement Company at Barking. They also inform us that they have a great number of orders to execute, and in consequence have been compelled to order a large number of extra machines.

A LARGE clock has just been erected in the tower of Brill parish church, Buckinghamshire, which strikes the hours, chimes the Cambridge quarters, and shows time on one dial facing south. It is fitted up with all the latest improvements, and made generally to the designs of Lord Grimthorpe, by Messrs. John Smith & Sons, Midland Clock Works, Derby. Mr. T. H. Seargeant, of London, was the donor.

THE new Board schools, Carlisle, for the Carlisle Board, are being warmed and ventilated throughout by means of Shorland's patent Manchester grates and patent ornamental exhaust roof ventilators, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

THE form of gully supplied by the Patent Gully Company, Limited, of Nottingham, is designed to remove certain disadvantages under older systems, and to save the money of the ratepayers. The gully is made from cast-iron. It is formed with a partition across to a determined height so as to form two chambers—one, the gully proper, and another of much less capacity to form a second. The outlet is from the second chamber by means of a dip pipe or tube of sufficient depth to form a trap. The flood water is carried away through the dip pipe to the drain, and this chamber is so constructed that the smallest amount of water therein forms an efficient seal. The second chamber being effectually protected, prevents any street

refuse getting in and evaporation taking place. The plug hole on the bend of the dip tube gives easy access to the drain without disturbing the streets. No corners are left in the gully proper, the bottom of the tank being so rounded that it can be thoroughly cleaned out with the ordinary scoop. The bell or bonnet attached to the grating is so formed that the surface of liquid in the tank exposed to the air is of the smallest possible description, being little more than the area of the outlet. The house gully is made in cast-iron or earthenware alone, or earthenware gully with cast-iron frame and grate.

WE notice reduction in prices by Mason & Co. (late F. Dyer) for the excellent patent automatic tidal valve trap and Dyer's air-tight manhole covers. These air-tight manhole covers have this advantage over others in the market. In addition to their great strength and neatness they are air-tight by pressure on india-rubber seating, as shown in section above. The cover entirely lifts out of the frame, with proper handles made for that purpose; thus the trouble of opening as in the hinged ones, through dirt setting same tight, and the danger of the cover (not then being easy to get beyond the perpendicular through rust, &c., in hinge) falling on any workman's head or hands engaged under them, is entirely removed.

PENDANTS and brackets are required in connection with the gas-fittings to be furnished for the new infirmary block of the Fife and Kinross District Lunatic Asylum at Springfield, Cupar. Messrs. Kinnear & Peddie, 3 South Charlotte Street, Edinburgh, are the architects.

WE would direct the attention of our readers to "Porcelaine" (Mr. T. R. I. Maurice, Lambeth, sole inventor and manufacturer). Any colour or tint is available, to judge from the samples to hand, and in addition to superseding enamels and paints it has the advantages of being non-poisonous, of quickly drying, and, after being applied, neither cracking, chipping, blistering or peeling off.

THE proposed Vauxhall Bridge, which is the object of a private Bill, is to have five arches, and to cost 484,000*l.* The works will occupy seven years. During the construction a temporary bridge will be erected near the British Gallery.

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ELECTRICAL.

THE Glasgow Corporation have asked Professor Becker, of Glasgow Observatory, to report regarding a system of regulating the public clocks by electricity.

AT the meeting of the Worcester City Council the electricity committee brought forward three candidates for the appointment of electrical engineer. The Council decided to refer the matter back to the committee, there being an opinion that the duties were to be undertaken by the city surveyor, and on that understanding his salary was fixed.

THE foundation-stone of the central station of the Islington Vestry for supplying electricity for lighting purposes under a provisional order obtained in 1893 has been laid at Eden Grove, Holloway. The site adjoins the Great Northern Railway, and the land was purchased from the railway company at a cost of about 9,000*l*. The central station, which will be built by Messrs. Macfarlane Brothers, from the designs of Mr. A. Hessel Tiltman, is to cost 18,000*l*., and the machinery and plant, including the mains and conduits and public lamps in the compulsory area, will cost 33,000*l*. more. The system adopted is that of a high tension alternating current, with transformers on the premises of the consumers; and for street arc lighting the same, with commutator transformers at the works, of the Ferranti type. Mr. Albert Gay, the electrical engineer of the Vestry, is superintending the carrying out of the work.

BUILDING AND BUILDERS.

THE Edinburgh Dean of Guild Court have granted eight warrants, and among them sanction to the North British Railway Company to erect a new parcel office at the Waverley Bridge in place of the present one and of much the same appearance, though larger.

THE *Glasgow Herald* says that at Hamilton the past year has been an exceptionally busy one in the building trade. The Dean of Guild Court have issued forty-seven linings against thirty-three in the previous year; while the estimated cost of the structures is 48,000*l*. against 27,000*l*.

THE *Manchester Guardian* says:—The bleaching and dyeing works of Messrs. Nathan Ramsden & Co., of Breightmet, near Bolton, have been destroyed by fire, the damage being estimated at 3,000*l*. The Bolton Corporation fire brigade were summoned, but as the buildings were outside their radius they (act-

ing on instructions) refused to attend. Before the Bury brigade arrived the works were doomed. A member of the firm declares that had the Bolton firemen attended when summoned the premises would not have been wrecked.

THE annual dinner to the Hereford Corporation workmen took place on Tuesday, the 1st inst., Mr. W. J. Humfrys, the mayor, presiding.

AT North Walsham a dinner was given in the Town Hall to the employes of Mr. William Wilson, builder, and Mr. William Coe, plumber and glazier, both of North Walsham. The idea of the dinner originated through Miss Moore and Mr. and Mrs. Harry Smith, of Sheringham, with whom Mr. Wilson and Mr. Coe have had extensive building contracts, who wished to show their appreciation of the manner in which the workmen had performed their duties by giving them a dinner.

AT Ipswich Mr. Henry Underwood has just given the annual dinner to his employes. The workmen engaged in building the new workshops were invited to attend, with the permanent staff, and the number present exceeded forty. Mr. Underwood presided. Mr. S. Foulger proposed "Success to the New Venture," referring to the perfect harmony existing between capital and labour in the firm; where such good feeling was shown any extension or new departure deserved success. Mr. Underwood, in response, said it was a source of satisfaction to him to see at these annual gatherings so many old faces. If he found that those employed were constantly leaving him he should soon look round for the cause. He hoped they would work together in the future as they had done in the past.

AT Newcastle-on-Tyne Mr. W. C. Tyrie, contractor, Newcastle and Gateshead, chairman of the Master Builders' Association, gave the annual dinner to his officials in the Collingwood Hotel. There was a large company, including a number of invited guests, and the host, in responding to the toast of his health and success to the firm, proposed by Mr. J. Tweddell, said he did not believe in the terms "employer and workmen;" they were all "fellow-workers," and he found them equally anxious with himself in all that made for the success of their business. Mr. Hall and Mr. Wilson responded for the officials, and remarked upon the consideration they at all times received from the head of the firm.

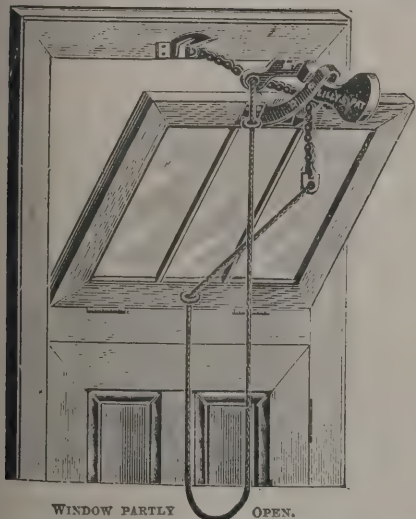
A MEETING of firms engaged in the building trade has been held at 31 Bedford Street, W.C., under the auspices of the Central Association of Master Builders. There was a large and representative attendance. In the course of the discussion which took place it was pointed out that many strikes have

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LILLY'S PATENT CHAIN FANLIGHT OPENER.

WINDOW PARTLY OPEN.

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Dead 45/-

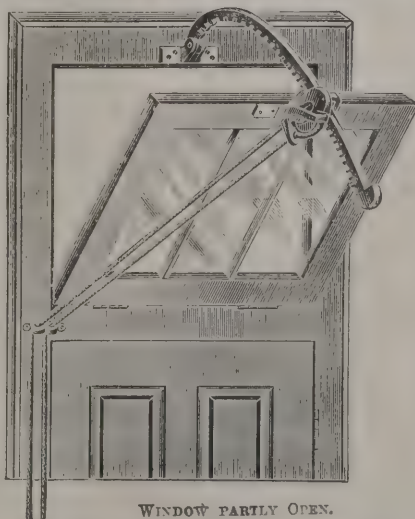
Polished 54/-

A 2624,

Iron.

Bronzed 30/-

per doz.

CARTLAND'S PATENT WINDOW OPENER.

WINDOW PARTLY OPEN.

A 2740.

All Brass,

Dead, 66/- doz.

A 2741.

Malleable Iron,

Bronzed,

42/- doz.

ADVANTAGES.—By the use of this Patent Fanlight Opener, a Sash can be opened to any required distance, and the action of loosening the cord causes the cam to clip chain and hold securely.

The Chains, made in Copper, are impervious to all atmospheric influences, and being quite flexible the Opener works with the greatest ease. It is suitable for any size sash.

Working Models of the above and other Specialties may be seen at our new Showrooms, 57 HOLBORN VIADUCT, E.C. Architects and Builders are invited to inspect same.

The Patentees have every confidence in calling the attention of Architects, Builders, Ironmongers and the trade generally to their new Patent Window Openers, as possessing advantages over all other Fanlight Openers in the market.

occurred throughout the building trade of London since the last agreement between masters and men in 1892 ; that these strikes are almost of daily occurrence now, and that the almost sole reason for this is caused by the union men refusing to work with non-union men. It is therefore now resolved that a notice in the following terms should be posted on all works and jobs :—
 “ It is a condition of employment at these works that, in accordance with the understanding of 1892, no workman should be placed under any disability by reason of either belonging or not belonging to a trade society.”

AMERICAN NOTES.

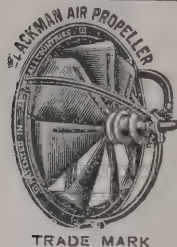
THE *Scientific American* says :—A remarkable instance of the rapid formation of alluvial deposits from overloaded streams has been discovered by the Government geological expedition on the Yaktse River, in Alaska. This river in its course from the Chaix Hills to the sea passes through a tunnel in the Malaspina glacier, some 6 or 8 miles in length. When it finally emerges into the open air it is a very swiftly flowing stream of dark muddy water, 100 feet wide and about 20 feet in depth. Near the point where the river emerges from the ice it flows through a forest of large trees, and the gravel and sand carried along by the stream are deposited here to the depth of many feet. Some of the tallest trees still project through the deposit and retain their branches. The greater part, however, have been broken off and completely covered up by the sand. In other places the presence of vast forests is indicated by a few dead branches projecting through the deposits. In places where the deposits are thickest all signs of the trees have disappeared, and in their place nothing may be seen but broad sand flats. These are inundated in stormy weather, and are of about the consistency of quicksand.

THE same Journal adds :—The great dry dock at Port Orchard, Washington, now in course of construction, will be the second largest dry dock in the world. It is to be equipped with a timber and concrete dock 675 feet long, with a floor width of 67 feet. Its greatest width will be 130 feet and its depth 40 feet. The dock will be closed by a gate or caisson built in the form of a ship with a hull and a bow at either end. This will be constructed of iron. The gate is pierced by twelve 20-inch filling culverts, each fitted with a gate valve. For emptying the dock, three powerful centrifugal pumps are provided, each of which is operated by a

separate engine. The steam for operating the pumps will be supplied by six large steel tubular boilers. The boiler pressure will be 100 lbs. to the square inch, and the pumps will be capable of discharging 110,000 gallons of water per minute. The gate is, however, the most interesting feature of the dock. The upper part is supplied with a water compartment provided with two 20-inch sluices, one of which opens into the sea and one into the dry dock. The gate is closed by filling this compartment with water and sinking it, the water being admitted through two 20-inch valves. The gate is handled by the aid of a capstan worked by a vertical shaft from the engine on the lower deck.

THE *Engineering Record*, New York, says :—Water filtration in St. Louis, Mo., has been studied for several years by Water Commissioner M. L. Holman, C.E., who is convinced that the purification which the river water secures by subsidence in the large settling basins of the new works is not likely to be satisfactory for many years. The problem is a serious one, for the amount of water used in the city annually is not far from 17,500,000,000 gallons now, and the operating expenses of the works are about 372,000 dols. a year. The new works, which are not yet completed, will cost a large sum, and the commissioner is naturally averse to propose the expenditure of another large sum for a filtering plant until he is sure that the system which he recommends is that best adapted for the city. Owing to the large amount of sediment in the raw river water the filtration becomes more difficult than were it free from the earthy matter. The amount of sediment in the water can be suggested to the reader from the fact that in one year over 210,000 cubic yards of this matter was removed from the settling basins at Bissell's Point. Mr. Holman is now conducting experiments to ascertain if he can keep sand filters free from clogging by a reversal of flow through the beds so as to wash them. He is also conducting experiments with carbon plates and with tripoli stone from a quarry in Carthage, Mo., which is porous like the artificial stones used in works for filtering the Rhine water.

THE *St. Louis Republic* says :—Near the little village of San Jose, Peru, on the shores of the great lake of Titicaca, the most lofty lake in the whole known world, are three pillars of stone of unequal height. On one of these huge blocks the rude features of a human being have been cut, and the other two are covered with designs of various kinds, all believed to have some mysterious reference to sun worship. Who the engraver



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For Advertisement of A. GILL & CO.,
 see page 13.

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MEDALS 1865, 1881, and 1893.

J. ATTWOOD.

STOURBRIDGE.

The only Attwood in the Trade.

of these monoliths was or at what age of the world the engraving was done is not known, but it is highly probable that it was done long before the Americas had ever been seen by any white man.

Stone of Indianapolis says:—At Webster City, Iowa, a ten-acre tract of as handsome hone stone as can be found in the world has just been discovered in Hardin county, about twenty miles east of here and two miles from Iowa Falls. Fifty cars of hone stone are in sight at the bed. The stone found in this bed has been tested by New York experts, and they pronounce it equal to that mined in Asia Minor.

AFTER the fashion of *Stone*, a periodical entitled *Brick* has been started in Chicago, and has reached its sixth number, which is just to hand. American engineers are instructed by one who does not sign a name as follows:—"I don't believe much in paving brick tests anyhow. They are mostly wrong, dead wrong. Now take the absorption test. A paving brick must not absorb more than two, or at most three, per cent. of moisture and if it takes less than that so much the better. I say that if a city engineer really knew anything about brick he wouldn't take a paver at any price that was absolutely non-absorbent. Why, sir, he might just as well put down chunks of glass in the street for horses to skate over." A good paving brick must be porous; of course it must not hold so much water that when the frost comes it splits the bricks in all directions. A paver that absorbs five per cent. of water is better than one which can only hold half that quantity. Now about the rattler test. If ever there was a misleading, useless test that's the one. It's supposed to show the wear of a pavement 'attrition' the engineers call it. What do we need to know about that? What we want is a hammer test." The writer of the note is probably an ironmonger.

CAISSONS v. DOCK GATES.

AT the meeting of the Civil and Mechanical Engineers' Society held on the 3rd instant, a paper was read by Mr. A. W. Ackermann, entitled "Caissons v. Dock Gates." He gave a concise history of caissons, which were apparently first used in France at the port of Rochefort in the year 1728 A.D. There is, however, some evidence of their having been used at a much earlier date by the Venetian Republic. General Bentham first introduced them into England for use in H.M. Dockyard, Portsmouth. The early caissons were constructed of wood

and heavily ballasted. Iron caissons were first used at H.M. Dockyard, Woolwich. No great improvement in their design took place until 1865, when the extension works of H.M. Dockyards, Chatham and Portsmouth, were undertaken by Sir Andrew Clarke, R.E., K.C.M.G., Director of Works for the Admiralty. The principles involved in designing caissons were explained. The advantages of caissons over dock gates were forcibly pointed out. The difference between ship and sliding caissons was clearly described, together with numerous details of their construction and the machinery used in connection with them. The paper was illustrated by large scale diagrams.

REVOLVING LIGHTS.

WE have from time to time noticed several improvements in lighthouse illumination introduced by Mr. J. R. Wigham (Edmundson & Co.), of London and Dublin. He has recently invented a new lighthouse light, and has brought it experimentally before the science department of the Royal Dublin Society. It may be briefly described as a method of making the illumination of revolving lights continuous, instead of as at present recurrent after intervals of darkness. A boon to navigation which mariners have very earnestly desired is that they might have the benefit of the great power and characteristic appearance of revolving lights and at the same time have them continually in their eye as are the fixed lights round our coasts. Mr. Wigham has had long experience in lighthouse matters, and this invention of his is considered the greatest advance which has been made in the science of lighthouse illumination since the time of Fresnel. Mr. Wigham's previous inventions, which have been adopted to a considerable extent by lighthouse authorities, have been mostly in the direction of conferring increased power on lighthouse illuminants. This new invention supplements those which he has previously made, inasmuch as it is applicable to all lighthouse lights—gas, oil, and electricity.

MESSRS. TUCKETT & SON, Basinghall Street, write us:—

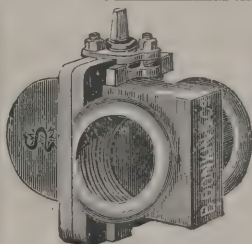
We beg to inform you that we have to-day taken into partnership George Rivers Fletcher, who has been with us for nearly thirty years. He is personally known to most of our clients, and in more closely associating him with the business we feel that we are studying their best interests. The style of the firm will remain unaltered.

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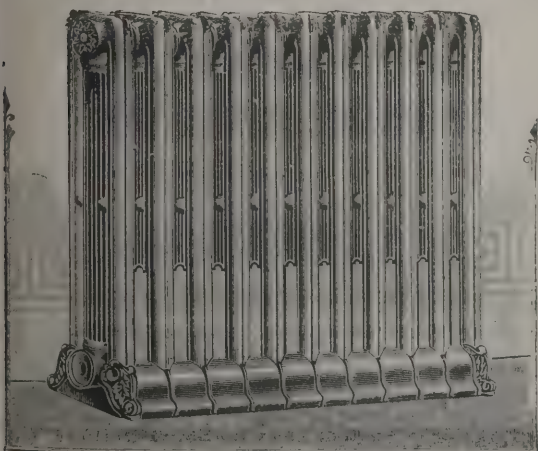
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BUILDING IN THE DUNDEE DISTRICT.

AT a time when many branches of local industry are suffering from a severe depression it is pleasant, says the *Dundee Advertiser*, to be able to point to one department of labour which can boast of its flourishing and prosperous condition. Such has been the state of the building trade in Dundee during the past twelve months. In the early months of the year prospects were by no means bright, and a dull season was expected, but when Whitsunday was passed contracts came out in surprising numbers. At Midsummer building was going ahead briskly all over the city, and since that period the trade has been fully employed. The feature of the year's work has been the large number of dwelling-houses that have been put in the hands of the builders. In explanation of this circumstance it is said that many persons who have in hand money which they are desirous of investing prefer to sink it in property at home rather than run the risk of losing it in foreign or colonial ventures, and in the carrying out of their desire they are assisted by the cheap rate of interest at which money can now be borrowed. Whether this is the real explanation, or whether it is to be attributed to the natural extension of the city, the fact remains that the past year has been exceptional in the amount of tenement work which has been, or is being, carried out. Building of a more public character has been scarce. Masons have been in demand during the whole year, and more especially since Whitsunday. It appears that at the present time there is a scarcity of this class of skilled workmen in the city. For a number of years the master masons had shown a disinclination to engage apprentices, but this policy they have now changed, and the yards have been stocked with young men, so that in the course of time the difficulty referred to should pass away. Wages have remained unaltered during the year, viz. 8½d. for builders and 8d. for hewers, this arrangement continuing in force until April.

The outlook for the coming year is bright. Already a number of large works are on the list, including the new post office, the new co-operative bakery, Mr. Aitken's property in Miller's Wynd, and a probable extension of the public baths. Many of the "jobs" on hand at the end of last year will extend far into the next, so that the prosperity which has attended the trade of recent months may be expected to continue for many months to come.

Building operations in Broughty Ferry during the past year have consisted entirely in the erection of dwelling-houses of

various classes. On the old Hermitage ground, which has now been feued, numerous dwellings have been or are in course of being reared.

In Newport, and especially in Wormit, the building trade has been exceptionally brisk.

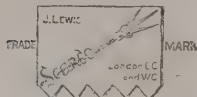
BUILDING IN BOLTON.

LIKE many of its predecessors, the year just closing has, says the *Bolton Chronicle*, been a period of considerable activity in regard to building operations in this borough and the neighbourhood. Including the completion of undertakings commenced previously to the advent of 1894 and the work still in hand by Bolton architects and contractors, the list of structural extensions and renovations assumes formidable proportions in the aggregate, and also shows great variety. A few new mills are in progress, and additions have been made to existing mills, manufactories and other industrial or trading concerns; one or two new places of worship are in hand; mission room and school accommodation has been added to; new shop building has been carried out extensively; and other structural work which the enterprise of the age has necessitated or suggested has received much development. One particularly notable feature has been the growth of dwelling-house erection; vacant spots in different quarters, but chiefly on the outskirts of the town—the Mortfield estate, Brownlow Fold, the neighbourhood of Back-o'-th'-Bank, Daubhill and Gilnow—being gradually occupied in this way; the houses are principally for the artisan and labouring classes, and generally the style of these blocks is attractive and the interiors commodious.

PORTLAND CEMENT.

If we may judge from certain letters in the architectural and engineering press, says Mr. G. A. Redgrave, and from the meeting of manufacturers which was recently held at the Cannon Street Hotel, the Portland cement trade—one of the most important industries in the London district—is threatened with innovations calculated to do the most serious injury, alike to those engaged in the production of this material, and also to all those who make use of cement. It is urged on behalf of

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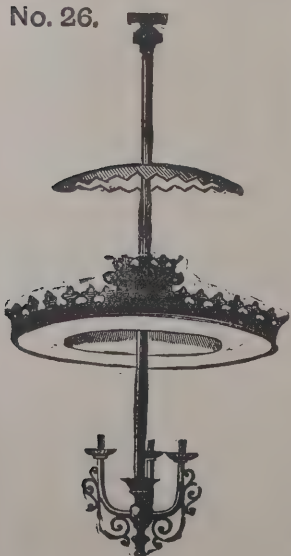
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J. C. HALLIDAY,
INVENTOR AND MANUFACTURER,

12 GRAINGER STREET,
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certain manufacturers that it is necessary to form an association of English Portland cement makers pledged to avoid all mixtures of less valuable ingredients with the cement after calcination. This step they affirm to be imperatively needed, because certain cement dealers in the London district are in the habit of cheapening their cement by grinding up with the "clinker" (the product as it comes from the kilns) a considerable percentage of Kentish ragstone—a hard, inert substance of comparatively trifling value. From statements made by those well acquainted with the trade the cost of making Portland cement is reduced by this practice as much as from 2s. 6d. to 3s. 6d. per ton, and this amount, therefore, goes into the pockets of the producers, for no proposal has been made hitherto to sell this mixed material at a lower price than genuine Portland cement.

The possibility of adulterating cement in this way is mainly due to the defective tests which suffice in this country to satisfy users of cement, but it is alleged also that we have no official and generally-recognised definition of the term "Portland cement." A well-known firm, which makes no secret of its use of ragstone, maintains indeed that "Portland cement is only the name for an article of admixture," and founds thereon an argument for the incorporation with the cement of "an ingredient whose beneficial action has only lately been discovered." I have long foreseen the probability of the events now taking place, and in a paper which I prepared in conjunction with the late Major-General Scott, C.B., and which was read before the Institution of Civil Engineers more than fourteen years ago, we stated that we trusted that "engineers would agree in declaring that the time had arrived when a uniform scheme for the testing of Portland cement could be drawn up and a standard scale of tests could be adopted throughout the country." In Germany, where the process of mixing cements with slag, powdered limestone, slaked lime, and other adulterants was at one time largely and skilfully practised, it has been found possible, by the adoption of standard tests and by the formation of a powerful association of manufacturers, to stamp out this vicious system. It was conclusively proved at that time, now about ten or twelve years ago, that all these substances, added to the cement subsequent to the calcination, had the effect of diminishing its value *qua* cement, and in those cases where small quantities of extraneous ingredients appeared to increase the tensile strength of the material it was shown that this apparent gain was really due either to defects in the method of testing the cement or else to imperfect grinding.

It is in both of these directions that our own system is at

fault. English cements at the present time are in the great majority of cases insufficiently ground, while the tests of neat cement which are still in general use fail to indicate the presence of large percentages of coarse unground particles, which are of no more use than an equal bulk of sand.

Careful tests have convinced me that none of the grains of cement which are retained on an 80-mesh sieve are of any cementitious value, whereas it is the common rule in England to specify not more than 10 per cent. of residue on a 50-mesh sieve. It is the presence of these coarse particles in most cements which enables manufacturers who grind their cement rather finer than do their neighbours to introduce considerable percentages of cheap inert substances without detracting from the quality of the product, as indicated by the tests in common use, while the absence of a definite understanding about the composition of Portland cement opens the door to what German manufacturers have stated to be "a fraud upon the consumer." Throughout Germany Portland cement is declared to be "a material resulting from an intimate admixture of lime and clay as its essential components, calcined to incipient vitrification and reduced to powder."

BUILDING IN ABERDEEN.

FROM its variety of industries Aberdeen was favoured with a marked degree of prosperity during the year. Some trades were less fortunate than others, but, taken all over, the general depression experienced in southern centres was not felt to the same degree in the Granite City. The condition of the building trade, says the *Scotsman*, may be taken as a fair criterion of the state of business in the city, and in this department of work the activity was of an unusually vigorous character. No fewer than 377 plans of new houses were sanctioned, representing a total value of 257,280/. In the previous year 251 houses were put up. The city has vastly extended in all directions. Handsome new thoroughfares are cropping up in the suburbs, and the large number of new public and private buildings which have recently made their appearance very greatly enhance the architectural aspect of the streets. Glancing at what has been overtaken during the year, the extension of Marischal College was pushed on, but the work of erecting the Mitchell Tower has been discontinued until spring. A new public school at Broomhill is approaching completion, at an expenditure of about 8,000/. or 9,000/., and improvements and extensions were carried out on a large

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number of other educational institutions. A new church was built for the Free Holburn congregation in Great Western Road, costing about 5,000*l*, and another church was erected for the Baptist congregation at Rosemount Viaduct. In course of construction is a new church for Bon-Accord Free Church, at a cost of about 5,500*l*, and an Established church at Cleave-the-Wind, at an expenditure of 2,500*l*. The extension of the Royal Lunatic Asylum has been in progress, and the work is estimated at 20,000*l*, while the City Hospital enlargement, estimated at 13,000*l*, is nearly completed. New police buildings in Lodge Walk, to supersede the old prison, are finished, and these will cost about 10,000*l*. A prominent structure at the east end of Castle Street (the Salvation Army Citadel), estimated at 13,500*l*, is well advanced. The extension of Trinity Hall, belonging to the Incorporated Trades, formed a notable feature of architectural rearrangement. In Union Terrace a handsome new savings bank is to be erected at an outlay of 10,000*l*. The Sailors' Institute in James Street has undergone large additions and alterations. A new public soup kitchen was opened in Loch Street the other day. In Guild Street the Great North of Scotland Railway Company occupied this year a large administrative block costing about 12,000*l*. A new hotel is in course of construction in King Street. In Rosemount, the Northern Co-operative Company are erecting a large block, the expenditure being 7,000*l*; and in the same vicinity, Rosemount Avenue, the Foresters are putting up an extensive block of dwelling-houses. The number of private dwelling-houses erected in the city during the year was quite phenomenal, the total being 252, or sixty-eight more than last year, the value increasing from 126,855*l* to 180,685*l*, a rise of 53,830*l*. Turning to a staple industry, the granite trade, operations were fairly active. Dulness was experienced in the monumental department on account of depression in the American exports. The larger firms were busy with contracts in the form of polished fronts for buildings, and this branch of the industry is reported to be steadily increasing. There is a demand among architects for polished granite fronts to large buildings, and many orders of this description were executed for cities in England and Ireland, besides the manufacture of polished counters and tables for restaurants and hotels. In the granite trade generally complaint is made of the "cut" prices and keen competition. The export trade with America shows that during the first nine months of last year the value of manufactured granite sent from Aberdeen amounted to about 69,000*l*, while during the same period in the present year it fell to

44,700*l*, a reduction of 24,300*l*. It is confidently anticipated, however, that business will take an improved turn, and already the orders booked for spring are on the increase. The reduced tariff may have something to do with this. A notable circumstance is the large decline in connection with the imports of foreign granite, particularly the Norwegian material, to Aberdeen, which is mainly worked into monuments for the American market. In 1893 as much as 13,700 tons were brought to the city, the harbour dues on this item alone bringing 285*l*, while during the past year the imports fell by more than 5,000 tons. The total imports came to 8,224 tons, the dues realising 171*l*, the decline in quantity and value respectively being 5,476 tons and 114*l* dues. The home quarries were affected to a certain extent by the dulness in the monumental trade, but the output was reported larger at most of the principal quarries. An unlimited supply of fine stone is available. Messrs. Alexander Macdonald & Co. executed several commissions for the Queen, both for Balmoral and Windsor, and are at present carrying out the contract for Crathie Church pulpit, which will be a chaste work of art composed of about a dozen different Scottish granites. The same firm did good business in quarrying and general manufactured work, the latter including several fountains, pedestals and memorials. Mr. James Hutcheon, Hill of Fare quarries, secured the contract for the granite work of the new bridge across the Kelvin at Glasgow. Mr. John Fyfe's quarries were fully and briskly employed. Messrs. Whitehead & Sons were busy with contracts for polished granite fronts and monumental work, and the same encouraging business was done at the other Peterhead quarries. The manufacture of the new material, adamant stone, by Messrs. A. & F. Manuelle, gives promising results.

THE LITIGATION OF THE LONDON COUNTY COUNCIL.

A CORRESPONDENT of the *Times*, who has justified the title he assumed, "One Who Knows," sends the following remarks on the litigious spirit of the London County Council:—

We are a patient people. But there is a point beyond which even the most stolid patience refuses to be pressed. What are the feelings of London ratepayers, as half-year by half-year they find the local rates growing in amount, and their attention drawn by the vestries to the fact that this increase is due to the London County Council? In my own case I pay

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now every half-year considerably more, much more, than I used to pay in the year, and my case must be that of every householder. Do I, as a citizen, reap in improvements and extra accommodation an adequate compensation for this extra and steadily-growing burden? I cannot find that I do, and most householders, I believe, will tell the same story.

It is a matter of course that a County Council mainly composed of faddists, who call themselves Progressives, should pay no heed to the expense involved in carrying out their views. It is not upon them that the burden falls; and it is delightful to be free to have a rating power at command for one's experiments on political economy and in legislation.

Take legislation as an example. Will any member have the courage to ask for a return of the number of Bills promoted by the London County Council during the last five years, of those that have been passed, of those that have been rejected in whole or in part, and of the costs the ratepayers have had to pay for their promotion? It will open a good many eyes to an abuse which it is high time to check; for the grievance does not merely lie in the money thrown away by the County Council, but quite as much in the enormous cost to which individuals and corporate bodies are put in defending their interests against invasion or encroachment. I deliberately say "enormous," having in my professional capacity had occasion to mourn over the ruinous expenses to which my own clients have been put in this way. My fellow-professional brethren can tell the same tale. They may have defeated the County Council, but at what an expense! The autocrats of Spring Gardens care nothing for this; indeed, as we professional men know, they conduct their Parliamentary campaigns as if it formed part of their tactics to cause as much delay as they can, and to weary out their opponents by aggravating the expense of a warfare which is always heavy at the best. The same policy governs their interference with the Bills promoted by other people. "No man's pie is free from their ambitious finger;" and demands are made for the insertion of absurd clauses in Bills which have to be fought out in committee, and generally defeated by the usual costly machinery of counsel and witnesses. Parliamentary Q.C.'s may rejoice at this, but what of the unhappy clients? It is of no use to say to them, "Swear not at all." In curses both loud and deep they denounce the hour that gave birth to the London County Council.

Nothing apparently delights that body more than to go on the war-path. They have slain the tramway companies; and

now the trumpet of defiance to the water companies, which they have blown so long, sounds a deadly charge against them, heralded by no fewer than eight separate Bills. If these ever reach committee, they will involve the ratepayers in costs which it is simply alarming to contemplate. If they succeed—a result certainly doubtful—the consequences to the community, it would not be difficult to show, will be still more alarming.

The County Council have hitherto failed to persuade Parliament that they should have the control of the water supply of London. A body more unfit for such an office could scarcely be imagined. When Mr. Cross introduced his Bill for the purchase of the water companies, after the most anxious deliberation, it was determined that to a public trust, in the hands of skilled men of high standing and responsibility to Parliament, could alone be confided a responsibility so great. Only then would the possibility be excluded of jobbing in patronage, and of the manipulation of votes which the employment of a vast number of officials and workmen would place in the hands of any other body. Before embarking in such a conflict with the water companies as that threatened by the County Council, surely the fitness of the Council for the trust should have been first debated. If affirmed, then they might with some grace have come to Parliament for powers to purchase. But until affirmed, what justification can there be for introducing eight different Bills to enable them to deal separately with the eight different companies?

One other important principle governed Mr. Cross and his advisers. It was this—that if any improvement in efficiency or economy was to result from buying up the water companies they must all be bought up. So the cost of separate boards and separate officials could be got rid of, and the powers of certain of the companies be interchangeably used to distribute the supplies more equally and at the smallest cost. If this were so in Mr. Cross's time, are things different now? Certainly not. Without having all the companies in one hand no adequate return can be hoped for the inevitable risk and cost which must be involved in taking over their eight separate undertakings. And now the County Council ask for powers in eight separate Bills to compel the companies to part with their undertakings.

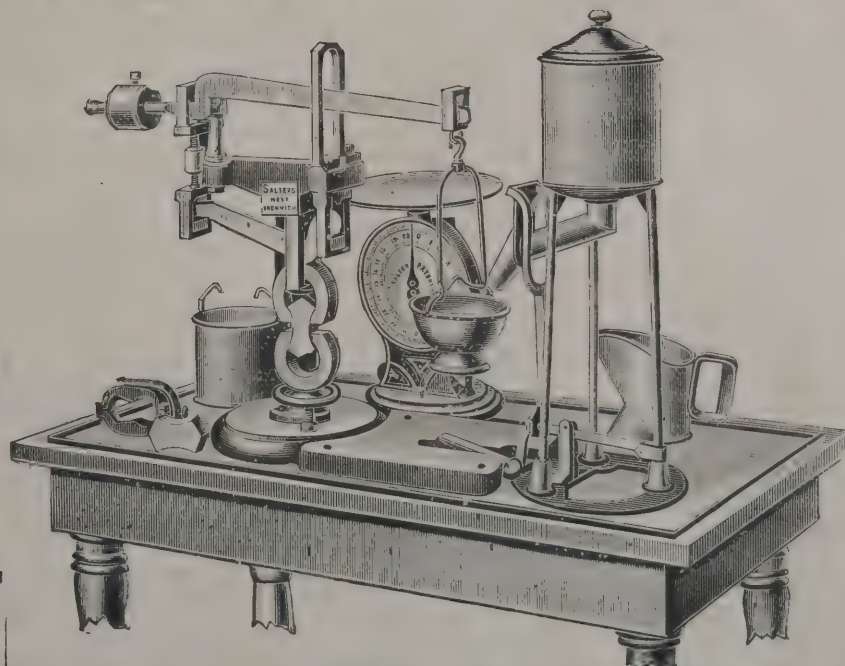
And on what terms are they to be bought? If no agreement is come to—and it requires no prophet to tell us that none will be come to—then the terms are to be settled by arbitration. Arbitration! Who that knows what arbitrations for compulsory purchase are but must shudder to think of the waste

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of time and money that will be spent over arbitrations where the property to be taken runs into a figure over thirty millions? Mr. Cross, being a man of business and strong common sense, knew well that to deal with the water companies in this way was hopeless. He therefore took the course of agreeing with them, after lengthened negotiations conducted on his behalf by the late Mr. Edmund Smith, a man not to be equalled now in capacity for so great an undertaking. Mr. Smith succeeded in obtaining terms which satisfied the companies, but which, unhappily, did not satisfy either the Corporation or the Metropolitan Board of Works, both of which bodies were furious at the prospect of the ambition being defeated which they had each long cherished, of getting the control of the water supply into their own hands. It is useless to recur to the melancholy tale of the use made by Sir William Harcourt and his party of the opportunities thus afforded them to strike a blow at Lord Beaconsfield's Government. The arrangement with the companies was negatived, but it soon afterwards became apparent that Mr. Smith was right in all his calculations. The prospective increase in revenue on which they were based was very quickly more than realised, and the community lost not only a large increase upon the market value of the purchase, but all the advantages which would have resulted since 1880 from concentration of management by a body of trustees, above selfish influence, with only the welfare of the Metropolis to consult. So was London sacrificed to party politics.

It is more than doubtful if what was then lost can ever be retrieved. At the same price I am convinced the undertakings can never be acquired, for their value has increased greatly since 1880. I observe from Mr. Beachcroft's letter in your paper of to-day, that he is much of the same mind; and, at any rate, he does not see where the money for the purchase is to come from. That essential was well considered and provided for in Mr. Cross's scheme. It would have imposed no appreciable burden upon the ratepayers. Indeed, under his scheme, had it been carried, there would by this time have been no burden at all on the ratepayers, and the price of water to the consumers would have been sensibly lowered.

Meanwhile, to those ratepayers who know what a fight with eight powerful companies means, the vista opened up by these eight Bills of the Council is anything but agreeable. The water companies, well drained already by the Parliamentary contests in which the County Council have involved them, can still afford to fight them without appreciably, perhaps, diminishing their means. But it will be a battle of the giants—and

who will suffer? Not the self-opinionated gentlemen who would place the Parliament of Spring Gardens above Queen, Lords and Commons, but we, the unhappy citizens, who find already our local rates more than we can bear. Let these things be remembered next March, when they will have an opportunity of returning men with a deeper sense of responsibility and more moderate ambition.

BUILDING LAND AT SALTLEY.

AN important arbitration case has been heard by Mr. Under-Sheriff Heath in Birmingham. The Trustees of the Hutton Estate claimed 25,000% from the Midland Railway Company for the compulsory taking of lands and for severing and injuriously affecting adjoining lands situate at Nechells and Saltley. The estate has an area of over eighty-nine acres, and is at present leased to the Tame and Rea Drainage Board, part of it being devoted to the purposes of the sewage farm. It was urged for the claimants that, owing to the isolated position of the estate, the preservation of a certain approach from Church Road, Saltley, was vital to its prospects as building land, and that, access from this point having been interrupted by the railway company, the value of the estate had suffered depreciation to the amount of 21,381%. One of the main questions for the jury was whether the estate had any prospective value as building land, and there were several minor points in dispute between the parties, apart from the legal considerations involved in the case. The estate was originally leased to the Birmingham Corporation in 1867 at 7% per acre per annum, and on the constitution of the Drainage Board it was transferred to that authority. The lease expired in 1889, but was renewed, the price being reduced to 5% 6s. per acre. Stress was laid on the fact that there were certain reservations in the leases as to the landlord resuming possession of a portion of the land for building purposes at short notice.

Mr. Lister Lea, surveyor to the estate, stated that the land was admirably adapted for the erection of warehouses and factories, the immediate contiguity of the railways and canal affording exceptional facilities for transit. He maintained, however, that the approach by road which the Midland Railway Company had blocked was essential to the development of the estate. He estimated the value of the estate for building purposes at 58,000%, and stated that it was in contemplation to offer the land for building sites when a favourable time arrived.

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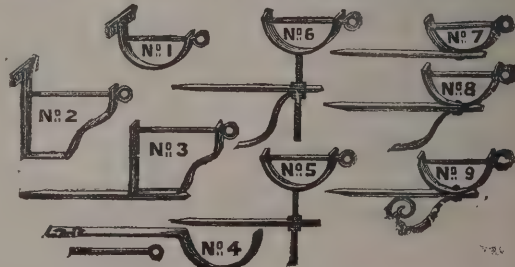
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An opportune occasion had not arisen for eight or nine years past, or the claimants would have availed themselves of it. Whilst recognising that the sewers on the estate would have to be dealt with before buildings could be erected, he did not anticipate any serious difficulty in that respect, nor did he think the fact that the land had been used for sewage-disposal would be prohibitive.

Mr. Mason (Messrs. Hedley, Mason & Hedley, surveyors) also agreed that the estate had a prospective value for building purposes, and expressed the opinion that it would be ripe for building in fifteen years if Birmingham continued to grow at the same rate as it had during the past fifteen years.

Mr. Christopher Oakley, a London surveyor, admitted that there were special difficulties in the way of developing the estate for building, but did not regard it as unadapted to the purpose. The approach through the 50-feet archway he considered all important.

Mr. T. S. Fallows (mayor of Birmingham) gave it as his opinion, as a surveyor of long experience, that when the present lease had expired the land in question would be fit for development as a general building estate. Anyone who knew the neighbourhood was well aware that houses and works had advanced quite close to the estate. He considered that in eighteen years the value of the land would be 800*l.* an acre—that was 2*d.* per yard leasehold, which he thought was a very low figure to put it at. The closing of the access at the south end would completely ruin the property for building purposes, and the blocking up of the archway would depreciate its value by two-thirds, or 533*l.* an acre. Evidence on behalf of the Midland Railway Company was then given.

Mr. William Martin (Messrs. Martin & Chamberlain, architects and surveyors, Birmingham) said he regarded the larger portion of the estate to the north of the London and North-Western Railway as purely agricultural, and as possessing no prospective building value. In cross-examination he admitted that some thirteen years ago he drew up a plan showing how that part of the estate within Saltley might be cut up for building purposes, but at the time he was unaware of the rights attached to some of the easements, and he had since found there were legal obstacles to the construction of a road on which the scheme hinged. The estate was divided into small plots by the sewers and watercourses which intersected it, and it was his conviction that it was no nearer development as a building estate now than it was twenty years ago.

Mr. George Matthews also gave evidence to the same

effect, and said the accommodation works proposed by the railway company were adequate for the estate as agricultural land. He had no doubt a plot of land here and there might be let for building, but what he questioned was whether, as a whole, it would be worth the expense involved in laying it out.

Mr. John Wilmot (Messrs. Wilmot, Fowler & Wilmot, surveyors) expressed a similar opinion.

Mr. John Macdonald (engineer-in-chief to the Midland Railway Company) explained that it had been found necessary to take a portion of the claimants' estate to the south of the London and North-Western Railway in consequence of the doubling of the lines between Derby and Birmingham and the abolition of the level crossing in use at Saltley. The railway company were prepared to make accommodation works providing adequate access to claimants' property. This completed the case.

Mr. Bidder, in addressing the jury, characterised the claim as being made up of reality and romance—the reality being measured by hundreds of pounds and the romance by tens or thousands. Although the Midland Railway Company had taken the strip of land across the mouth of the arch which claimants contended was the essential approach to the estate, it was obvious that their object was to continue the road under that arch; but the claimants had rejected all proposals with regard to accommodation works, and had insisted on getting their pound of flesh. He submitted that the land on the north of the London and North-Western had no prospective building value, and it was consecrated to the deposit of the sewage matter of Birmingham to all ages.

Mr. Jelf replied, urging that the great weight of evidence was in favour of the view that the estate was adapted for building purposes, that it was conclusively established that it had always been in contemplation to apply it to that purpose, and that the action of the railway company must indubitably have a very detrimental effect on its value.

The Under-Sheriff having summed up, the jury retired, and an hour and a quarter elapsed before they returned with a verdict. Their finding was that for the two pieces of land compulsorily taken the railway company should pay 33*l.* and 450*l.* respectively. They awarded 280*l.* as compensation for injury done to a strip of land on the south side of the London and North-Western Railway; and with regard to the larger question concerning the seventy-seven acres of land to the north of the railway, they found that it had a remote building value, and assessed the damage sustained by the claimants at 2,125*l.*

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THE STOCK EXCHANGE, BOSTON.

WE publish below an illustration of a stairway and hall in the Exchange Building of Boston, Peabody & Stearns, architects. This building was completed last December and is located in the financial centre of the city. It is the home of the Stock Exchange, several national banks and numerous brokerage firms. The stairway is in the centre of the grand hall which leads directly to the floor of the Stock Exchange. It is of Bardiglio marble, a greyish-white with veinings and mottlings of a dark grey, which has a very high polish. At the top of each newel post is a globe held from rolling off its perch by four clusters of honeysuckle beautifully carved in high relief. A skylight of enormous proportions illuminates the hall and stairway, and also becomes the illuminating ceiling of a large banking-room. It is of wrought and lattice-iron and copper framing, in which is set ground-glass panels five-eighths of an inch in thickness. It is painted white, and the walls, which are in plaster, are painted a yellowish buff, but the pilasters which support the arches are creamy in hue, and the archings over doors and windows are still lighter, making a colour gamut of delightful freshness, harmonising with the Bardiglio marble used for stairway and for the flooring and wainscoting. The doors and windows are of mahogany, which gives the positive accent needed.

THE GENERAL POST OFFICE NORTH.

THE new building in St. Martin's-le-Grand, which will be known as the General Post Office North, stands upon about an acre and a quarter of ground, the cost of which, exclusive of that part at the north-eastern end where stood the old Money Order Office, has been 326,200*l.*, while it is estimated that the building itself will cost altogether as much as 200,000*l.* On plan it is somewhat irregular, the eastern front, facing St. Martin's-le-Grand, being considerably larger than the western front, which faces King Edward Street. In both fronts are archways opening directly into a courtyard which runs right through the building, while the doors giving access to the interior open from each side of the archways. The St. Martin's-le-Grand entrance will be that mostly used both by

the officials and the general public. The building is five storeys in height, but the last is only partial, and will be devoted to kitchens and refreshment-rooms. There is also a large and well-lighted sub-ground floor available for clerical work, while below that there is a spacious basement extending under the whole building, including the courtyard, which is admirably adapted for storage. The interior of the new post office is effectively arranged. In the corridors the flooring is of stone mosaic, while wood parquet flooring is to be found in all the larger rooms. A feature of the internal arrangements to be noticed is the vast rooms on the third and fourth floors respectively. There are two such rooms, each measuring about 100 feet long by 45 feet wide, on each floor, lighted on the one side from the courtyard, and on the other from the street, and each room will accommodate, it is said, no less than one hundred clerks. Apartments have been set apart at the south-west corner of the building on the ground and first floors for the use of the Postmaster-General and the Secretary. It is calculated that altogether the new building will accommodate about 2,000 persons, comprising the Postmaster-General, the Secretary, the Solicitor, and the Receiver and Accountant-General, and their respective staffs, all more or less numerous, while the whole of the fourth floor is to be devoted to the female staff employed in the postal order branch, numbering over 300 persons.

The general arrangements of the interior of the new General Post Office are in every respect complete as regards the comfort and convenience of the staff. Not only are there several staircases, but the various floors will also be connected with lifts, of which we believe there are to be no less than four, thus securing a maximum of speed with a minimum of fatigue in the general intercommunication of the various branches of the Department therein located. The principal passenger lift, it should perhaps be remarked, will be worked on the hydraulic ram principle, the ram descending into a well 75 feet deep. A curious feature of the roof of the new building is a well marked tennis court, which is supposed to have its origin in a playful suggestion of one of the postal authorities that, being quite flat, the roof appeared well adapted to this popular summer game. The new Post Office has been designed by Mr. Henry Tanner, surveyor of Her Majesty's Office of Works.



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THE BLACKWALL TUNNEL.

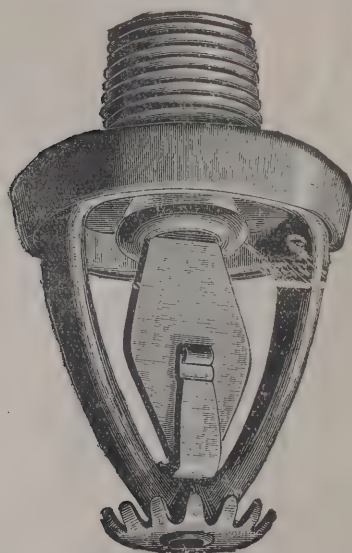
THE problem of joining the two banks of the Thames below London Bridge has occupied the attention of engineers for many years past. In the first year of this century (says the *Times*) an attempt was made in this direction by means of a tunnel, and twenty-four years later Brunel's great work was commenced. When the Thames Tunnel was built there was open country—meadows and marshes—as soon as Bow Bridge was crossed and the traveller had passed from Middlesex to Essex; indeed, fields and country lanes extended almost up to the confines of Whitechapel. Now Stratford, which for years later possessed the characteristics of an outlying country town, is the centre of a densely-populated district extending for miles in each direction; whilst further east still are whole colonies of suburban residences, closely packed, where, in Brunel's day, stood isolated villages surrounded by tracts of forest and meadow land. Much the same may be said of the Kentish side; and there are now continuous lines of factories, wharves and docks as far as Barking on the north and Woolwich on the south bank of the river. All this vast district, equal in area and population to two large towns, is, as Brunel left it, cleft in twain by the river. It is to link these two important eastern limbs of the Metropolis that the Blackwall Tunnel is now being constructed.

The site of the work is in the bight of the Thames formed by Blackwall and Charlton reaches. On the Middlesex side the northern approach connects directly with the East India Docks, close to the chief entrance, and on the Kentish side the tunnel leads to the desolate peninsula to the eastward of Greenwich. The total length of the tunnel and its approaches is 6,200 feet, of which 1,735 feet consist of open approaches. The roadway is 16 feet wide, with 3 feet side-walks, in addition to which extensive roads leading to it are being constructed. At the present time the work has been in progress somewhat under three years, and possibly it will take two more years before it is complete, although subaqueous work is always uncertain. The river tunnel will be approached by an inclined roadway on each side, partly open cutting and partly tunnel, up and down which the vehicular traffic will have to ascend and descend. The gradient averages 1 in 35, which is about the steepness of St. James's Street.

In carrying out the work there have been constructed four large vertical shafts, two on each side of the river. Two are of 98 feet, one of 75 feet, and the other of 76 feet deep. They are in

themselves, considered apart from the other work, important structures. At their lower ends they form points of departure for the tunnelling operations.

Water is, naturally, the great enemy of the subaqueous tunnel engineer, and in the case of the Blackwall Tunnel the difficulties encountered will be of more than ordinary magnitude. In order to meet these the engineers have had recourse to the Greathead shield, so-called after its inventor, the well-known engineer of that name. It may be briefly described as a strong cylinder or tube of steel, approximately of the diameter of the tunnel to be made. In the present case it is 27 feet 8 inches in diameter and 19 feet 6 inches long. About half-way in the length of the cylinder are placed two bulkheads or diaphragms made of stout steel plates, there being a distance of about 3 feet between them. The shield, having been erected beneath the surface at the depth required to commence the boring—the parts having been lowered down the vertical shafts previously excavated—the following method of working is followed. The cylindrical shield is of course on its side, that is to say, its axis is always parallel with the line of advance. The workmen pass through doors provided in the diaphragms and at once attack the face of earth exposed at the end of the cylindrical shield. It should be explained that the part of the cylinder forward of the diaphragm is divided up into twelve cells or working compartments, just as a house is divided by its rooms and storeys. This enables the workmen to reach the whole face at once. The earth is removed by ordinary means, and is passed through the diaphragm to be carried by trucks to the shaft, where it is carried to the surface. Whilst the excavation is going on in the fore part of the shield the tunnel itself is being erected in the tail part at the back of the diaphragm. The tunnel lining consists of massive segmental iron castings, which are bolted together. A suitable length of the tunnel lining thus being built up inside the shield—in the position it will occupy when the whole work is completed—and a corresponding length of ground having been excavated in front of the shield, it becomes necessary to move the shield forward. In order to do this there are twenty-eight hydraulic rams, which are fixed horizontally round the inner circumference of the shield. Their rams point to the rear of the shield, and when these are forced out, by the admission of water at pressure, they press against the completed ring of tunnel lining, the total pressure being 2,800 tons. In this way the whole shield is forced forward into the hole excavated, leaving the completed ring of the tunnel behind it—that is to say, the cylindrical



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shield is drawn off the tunnel lining just as the outer tube of a telescope slides off the smaller one within. It has been said that the shield slides forward into the space excavated to receive it; but, as a matter of fact, the forward edge or rim of the shield is made to form a cutting edge, and as the rams press the shield forward this edge is forced into the earth, thus making the hole exactly to the shape of the shield. The whole of the earth displaced has, however, to be removed to the back of the diaphragm by the workmen. When the shield has been moved forward the hydraulic rams are withdrawn into their cylinders again, and thus space is exposed for a fresh ring of lining to be erected, and the operations are thus continued by intermittent stages. Cement grout is forced through holes in the iron lining, and, when set, forms an outer coat to the lining, occupying the space vacated by the shield when it slid forward.

So far we have described the operations pursued when working in firm soil, but even in this case the shield offers great advantages, though its virtues are not so manifest as when difficult water-bearing strata are reached. It will be seen that in any case the workmen are protected by the shield from any fall of material, and for this reason the extensive timbering necessary to support the superincumbent weight of earth is avoided. The work on the Blackwall Tunnel will by no means all be of this rosy nature; indeed, the construction of the tunnel will, if successfully completed—as doubtless it will be under the present vigorous management—form one of the most notable feats of boring through watery soil in the annals of engineering practice. It will be seen that at the working face where the soil is exposed, water would be able to find its way into the shield were there any large quantity percolating through the strata operated upon. In constructing the tunnel the work will have to be carried for a considerable distance through a bed of loos gravel and sand, of which there will be no more than 7 feet between the crown of the working and the river bottom. Through this the water from the river, sometimes with a head of 47 feet, would pour in such copious streams that the workings would soon be drowned out were not special means taken to prevent it. Fortunately the practice of tunnelling in water-bearing soils has made great strides in recent years, and these means are at hand. They consist of forcing air at considerable pressure into the part of the shield where the excavators work in front of the diaphragm. In sinking the foundations of bridges, or other structures in loose soil with a head of water above, the use of compressed air is

not uncommon, but there the working is in a vertical direction, so that the method of operation is easily to be understood, the air being imprisoned as in a diving bell. In working horizontally, however, the same conditions do not apply. The air, of course, must be constantly escaping at the face, and in this way it partially blows back the water filling the interstices of the soil. A bed of clay, consisting of many thousands of tons, will be tipped into the bed of the river from barges, to obstruct further the ingress of water. The depth from high-water level to the bottom of the tunnel will be 80 feet, which is equivalent to an air-pressure of 35 lbs. to the square inch. Although this is high, it is not beyond the endurance of men suitably constituted for such work. We believe 48 lbs. to the square inch is the highest pressure at which men have been known to carry on operations of this nature, and in that case only two hours' work out of the twenty-four hours was possible.

On the whole, it will be seen that the work now being carried out upon the Blackwall Tunnel is of more than usual difficulty, and its prosecution will be followed with interest.

Mr. A. R. Binnie, the engineer to the London County Council, is chief engineer to the work, Messrs. David Hay and Maurice Fitzmaurice being resident engineers. Mr. J. H. Greathead is consulting engineer for the subaqueous and tunnelling work. Messrs. Pearson & Sons are the contractors, their tender amounting to 871,000*l*.

THE NEW ADMIRALTY OFFICES.

THE westerly block of the new Admiralty Offices has so far advanced towards completion that it will be ready for permanent occupation early in the new year, and plans for the eastward block are in hand. Along one side of the quadrangle, fronting the Horse Guards Parade, a double columnar stone screen will connect the new with the old building, forming a covered footway for the use of officials, while underneath will be a subway for internal communication. The design of the new building is a fenestrated type of Italian Classic architecture, three-quarter columns being introduced at salient points to afford appropriate relief. Careful consideration has been given to the skyline, with the result that, while adopting Classic detail, picturesque effect has been obtained, each feature of ornamentation being utilised for practical purposes, such as those of ventilators and water tanks.

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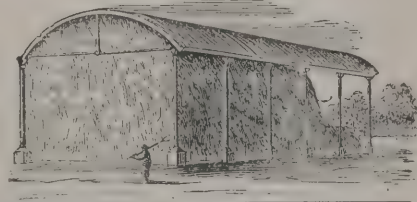
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The structure is placed in what may be termed a "dry dock," built up from the London clay in solid concrete, and encased with asphalt so as to insure perfect freedom from damp. This portion of the work was very difficult and necessarily costly, a sum of 23,000*l.* having to be expended before any portion of the building proper could be undertaken. The foundation is in marked contrast with that of the old building, the latter having a foundation of oak planking and sleepers, laid directly on the old river bed. The extra cost is not, however, wasted, as by the arrangement thus carried out two storeys of rooms, perfectly free from damp, have been obtained. The accommodation in the building is much larger than appears from the outside, no less than six storeys of office rooms, repositories, and strong rooms having been secured. One of the most noticeable features is the fine range of rooms on the attic floor level, all lighted from the internal court. By a novel construction of the roof, the space usually wasted has been utilised to the fullest extent, and rooms for draughtsmen and others have been provided.

The system of drainage is somewhat of a new departure in Government offices of this class, the whole of the piping, which is of iron, being in sight, so that any leakage can be at once detected. It was necessary to make provision against the effects of high tides and storms. Consequently, what may be described as four lines of defence have been laid—first, large automatic ball traps; second, sluice gates; third, a storm chamber beneath the Horse Guards Parade, the latter being sufficient to receive more than an inch of rainfall; and fourth, a sump at a lower level than the foundations.

Ample accommodation is provided throughout for the numerous departments. Overlooking the Horse Guards Parade is situate the First Lord's room, while facing the park, and overlooking the Horse Guards Parade, are the rooms for the various Naval Lords, Secretary's suite, and other principal officers. The cupola on the present new block will be duplicated at the south end of the old building, while in the centre of the connecting block still to be erected will be a fine dome. The connecting block is being planned on lines somewhat different from those in the first block. Therein will be imitated the "bank-parlour system," often advocated in the House of Commons, several of the rooms being of comparatively large proportions. This second block will house the extensive general library of the Admiralty. There will also be a subscription library, several committee-rooms, and ample provision for the caterer's department. The rooms for the latter purpose

will practically be isolated from the remainder of the building, and they will be self-contained, so that the catering may be done on the co-operative system.

These buildings have been erected from the designs of Messrs. Leeming & Leeming, of Westminster and Halifax.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 24565. Frederick John Burrell, for "Improvements in sash-fasteners."
- 24648. Heinrich Hoopman, for "Improvements in roofing tiles."
- 24664. Harry Francis, for "Improvements in appliances for holding windows and preventing rattling."
- 24670. Robert Youngh Ardagh and Charles John Moss, for "Improvements in connecting paving blocks for making suspended roadways, footways, flooring, bridging, stairways and for other like purposes."
- 24705. Joseph Hazelhurst and Peter Jackson, for "Improvements in chimney-tops or ventilating terminals, or the like."
- 24750. Israel Cartwright, for "An improved weather shield or draught-preventer for doors."
- 24757. John Green, William Rowland Green and Herbert Haguf, for "Improvements in ventilators."
- 24987. William Whitely, jun., for "Improvements in self-closing appliances for doors, windows, gates and the like."
- 24994. Johann Scheck, for "Improvements in building stones and bricks."

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SPECIAL NOTICE TO THE TRADE AND OTHERS.

[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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TENDERS, ETC.

* * As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

COMPETITIONS OPEN.

CARDIGAN.—Plans, &c., are Invited for the Building of an Intermediate School for Eighty Boys and Fifty Girls. Mr. James Stephens, 3 Green Street, Cardigan.

DURHAM.—March 25.—Competitive Schemes are Invited for the Sewage Disposal of the District. Premiums 100l. and 50l. for Two Best Schemes. Mr. F. Marshall, Town Clerk, Durham.

IPSWICH.—March 25.—Designs are Invited for the Building of a Workhouse and Infirmary, with Specifications and Estimate. Premiums 100l. and 50l. Mr. A. F. Vulliamy, Clerk to the Guardians.

LEEK.—March 4.—Designs are Invited for Proposed Covered Markets. Premiums 50l., 25l. and 10l. offered. Right reserved to carry out the Work by the Board's Architect. Mr. C. Henshaw, Clerk to the Improvement Commissioners, Leek.

CONTRACTS OPEN.

BAMBURGH.—Jan. 15.—For Building Pair of Houses. Mr. George Reavell, jun., Architect, Alnwick.

BELFAST.—Jan. 14.—For Building Manager's Residence, for Messrs. Bernard Hughes, Limited. Messrs. Macalister & Son, Architects, 5 May Street, Belfast.

BELFAST.—Jan. 17.—For Supply and Erection at the New Service Reservoir at Knockbracken of Cast-iron Standpipes, Valves, Outlet Mains of Steel and Cast-iron, and Sundry Ironwork; also Steel Lining for Outlet Tunnel, for the Belfast City and District Water Commissioners. Mr. R. Hamilton, Secretary, Waterworks Office, Belfast. Mr. L. L. Macassey, Engineer.

BISHOPSTONYMPTON.—Jan. 15.—For Building Cottages, Pigg-houses and w.c.s. Mr. J. A. Baker, 194 Upper Richmond Road, Putney.

BRADFORD.—Jan. 17.—For Building Warehouse, Clifton Street, Manningham. Messrs. Empsall & Clarkson, Architects, 65 Tyrrel Street, Bradford.

BRIGHOUSE.—Jan. 12.—For Sinking Fifty Shafts. Mr. A. M. Fowler, Engineer, 1 St. Peter's Square, Manchester.

BROCKLEY.—For Building Houses and Shops. Mr. E. Tompkins, Architect, Crofton Park, Brockley, S.E.

CARDIFF.—Jan. 22.—For Construction of Bridge under Railway. Mr. G. K. Mills, Secretary, Paddington Station, W.

CARRICK-ON-SUIR.—Jan. 12.—For Building Twenty-five Cottages. Mr. J. Mullins, Clerk to the Guardians.

CLONES.—Feb. 4.—For Carrying-out Waterworks. Mr. J. H. H. Swiney, Engineer, Avenue Chambers, Belfast.

COLNBROOK.—Jan. 21.—For Additions to School Buildings. Mr. Collier, Boys' School, Colnbrook, Bucks.

CHELSEA.—Jan. 14.—For Repairs, Painting, &c., at Embankment Gardens and Pimlico Shrubberies. The Architect's Department, County Hall, Spring Gardens, S.W.

DUNGARVAN.—Jan. 31.—For Works of Building, &c., at Bathing Place. Mr. Thomas McCarthy, Town Clerk.

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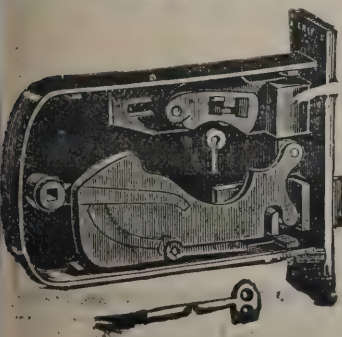
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FULHAM.—Jan. 15.—For Building Branch Free Library, Wandsworth Bridge Road. Messrs. Arthur Billing, Son & Rowley, Architects, Bank Chambers, Tooley Street, S.E.

GOLCAR.—Jan. 21.—For Additions to Board School and Building Infants' School. Mr. J. Barry, Architect, 9 Queen Street, Huddersfield.

GOOLE.—Jan. 14.—For Alterations to Steam Packet Tavern, George Street. Mr. W. B. Andrews, Architect, Boothferry Road, Goole.

HALIFAX.—Jan. 24.—For Building Sunday School and Parochial Room. Messrs. Horsfall & Williams, Architects, 15 George Street, Halifax.

HALIFAX.—Jan. 19.—For Building Twelve Houses. Mr. Medley Hall, Architect, 29 Northgate, Halifax.

HALIFAX.—Jan. 16.—For Pipe Sewer. Mr. Escott, Borough Engineer.

HASTINGS.—Jan. 29.—For Laying Sewers. Mr. A. R. Inskip, 11 Wellington Square, Hastings.

HASTINGS.—Jan. 14.—For Laying Patent and Ordinary Pipe Sewers. Mr. P. H. Palmer, Town Hall, Hastings.

HOLLOWAY.—Jan. 12.—For Building Laundry at Workhouse. Mr. Wm. Smith, Architect, 65 Chancery Lane, W.C.

KEGWORTH.—Jan. 19.—For Construction of Covered Reservoir of Capacity of 50,000 Gallons, and Providing and Laying 6 Miles of 4-inch and 3-inch Cast-iron Pipes, with Sluice Valves, Fire Hydrants, &c. Mr. George Hodson, Engineer, Bank Chambers, Loughborough.

LEEDS.—Jan. 12.—For Building Parcel and Superintendent's Offices. Mr. W. Bell, Architect, North-Eastern Railway, York.

LEITH.—Jan. 14.—For Bridge, Retaining Walls, &c., Seafield, for the Caledonian Railway Company. The Engineer's Office, Buchanan Street, Glasgow.

LEEDS.—Jan. 18.—For Alterations, Queen's Flour Mills. Mr. Albert E. Dixon, Architect, 8A Park Lane, Leeds.

LLANGATTOCK.—Feb. 4.—For Additions to Beaufort Hill Schools. Mr. W. S. Williams, Tredegar.

MADRID.—For Supply of Fire Extinction and Life Saving Appliances. The Spanish Consulate General, 23 Billiter Street, E.C.

MILDENHALL.—Jan. 19.—For Brick and Iron Girder Bridge. Mr. F. Whitmore, Architect, Chelmsford.

MOZERAH.—Jan. 28.—For Additions to Chapel House. Mr. Morgan Wm. David, Bryn, Rhydderch, Abergavenny.

MORLEY.—Jan. 15.—For Building Villa Residence. Mr. T. A. Buttery, Architect, Queen Street, Morley.

OXFORD.—Jan. 22.—For Footbridge over Railway. Mr. G. K. Mills, Secretary, Paddington Station, W.

PAIGNTON.—Jan. 31.—For Construction of Storage Reservoir, Two Filters and Works Connected, for the Local Board. Messrs. John Newton & Son, Engineers, 17 Cooper Street, Manchester.

PATELEY BRIDGE.—Jan. 15.—For Building Seven Houses and Shop. Mr. Thomas Wilkinson, Pateley Bridge.

PENZANCE.—Jan. 14.—For Building Day School for St. John's. Mr. Henry White, Architect, 1 Parade Passage, Penzance.

PERTH.—Jan. 12.—For Building Presbyterian Church. Mr. John B. Wilson, Architect, 112 Bath Street, Glasgow.

PETERBOROUGH.—For Pulling-down and Building New House and Shop. Mr. J. G. Stallebrass, Architect, North Street, Peterborough.

PONTYPRIDD.—Jan. 30.—For Construction of Tramroad 1 Mile 30 Chains in Length, Laying a 15-inch Cast-iron Conduit Main (1 Mile 55 Chains in Length), Construction of a Reservoir, Seven Filter-beds and Service Tank in Valley of Rhondda Fach River. Mr. Togarmah Rees, C.E., Corn Exchange Chambers, Newport, Mon.

PRESTON.—Jan. 16.—For Constructing Small Reservoir and Laying Water Pipes at Preston, near Linlithgow. Mr. James Strang, C.E., Falkirk.

RAINHILL.—Jan. 24.—For Additions, &c., to Infirmary Wards, Lancashire County Lunatic Asylum. Mr. R. C. Lewis, Clerk.

RIBCHESTER.—Jan. 12.—For Building Free Church. Mr. J. A. Seward, Architect, 16 Lune Street, Preston.

ROTHERHAM.—Feb. 4.—For Building Police Offices, Cells, Courts, &c. Mr. R. J. Lovell, Architect, 46 Queen Victoria Street, E.C.

SEVENOAKS.—Jan. 23.—For Five Fire-Escape Staircases, at Union Workhouse. Mr. Thomas Potter, Architect, 49 London Road, Sevenoaks.

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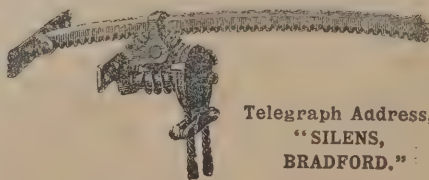
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SOUTH-EASTERN HOSPITAL.—Jan. 17.—For Drainage Works. Mr. T. W. Aldwinckle, Architect, 1 Victoria Street, Westminster.

STAINES.—Jan. 28.—For Works of Sewerage and Sewage Disposal. Mr. G. Maxwell Lawford, Engineer, 13 Victoria Street, Westminster.

STAMFORD.—Jan. 18.—For Building Post Office. The Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

STANLEY.—Jan. 12.—For Restoration of Church Hall. Mr. Thomas Raine, Architect, Peases West, Crook, Durham.

ST. GEORGE'S, HANOVER SQUARE.—Jan. 12.—For Works and Materials for One Year. Mr. G. Livingstone, 1 Pimlico Road, S.W.

STOCKPORT.—Jan. 16.—For Providing and Fixing Fuel Economiser, for the Corporation. Mr. A. M. Fowler, 1 St. Peter's Square, Manchester.

SWINDON.—Jan. 15.—For Building Wesleyan Chapel, Vestries, &c. Mr. Thomas S. Lansdown, Architect, Bath Road, Swindon.

TAUNTON.—Jan. 14.—For Building Lecture-room, Laboratory, Workroom and Storerooms for Boys' School, East Street. Mr. J. Houghton Spencer, Architect, 8 Hammet Street, Taunton.

TORQUAY.—Jan. 19.—For Building Church at Cockington. Mr. C. A. Nicholson, Architect, 11 Beaumont Street, W.

TREORKY.—Jan. 12.—For Extension of Board Schools. Mr. J. Rees, Architect, Hillside Cottage, Pentre, Rhondda.

UPPER BATLEY.—Jan. 11.—For Alterations to Elmwood House. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

WATFORD.—Jan. 25.—For Building Police Barracks, &c. Mr. Urban A. Smith, County Surveyor, 41 Parliament Street, S.W.

WHITEHAVEN.—Jan. 19.—For Building Sunday School, &c. Messrs. Moffat & Bentley, Architects, Whitehaven.

WIGTON.—Jan. 14.—For Building and Repairs at Workhouse. Mr. J. F. W. Ritson, Clerk.

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Voase & Owen, Beverley	£318 0 0
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J. Constable, Beverley	295 2 6
J. & W. Clark, Beverley	260 0 0
T. Bell, Beverley	255 16 6
R. Pape, Beverley	255 10 0
G. Pape, Beverley	248 10 0
J. RISPIN, Lockington (accepted)	225 4 6

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Batchelor & Son, Croydon	164 5 0
A. C. Ebbutt, Croydon	162 0 0
R. Bowman & Co., South Kensington	159 10 0
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H. W. Pearce, Croydon	151 6 6
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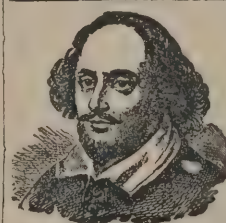
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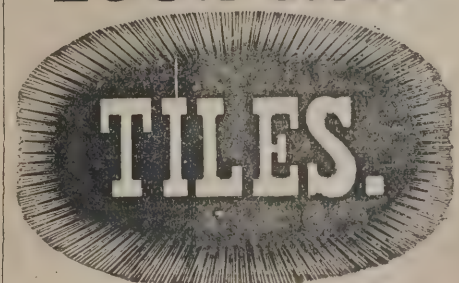
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Watson & Wilson, Blyth	1,069	14	0
T. Dodds, Bedlington	1,042	0	0
A. Gray, North Gosforth	1,030	0	0
English & Shotton, Forest Hall	1,023	5	0
W. Lowry, Byker	980	0	0
Dixon & Simmons, Cramlington	974	15	11
Phalp & Bird, Blyth	965	0	0
D. Spence, Amble	940	0	0
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Endean & Son, Cramlington	750	0	0

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T. LEITH & SONS, Dublin (accepted)	£277	2	5
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J. Jackson, Plaistow	960	0	0
H. Crane, Finchley, N.	897	0	0
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G. A. FRANKS, Guildford (accepted)	645	0	0

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A. N. Coles	548	1	11
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T. Shaddock	522	3	10

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E. Duke	349	10	2
T. Shaddock	322	3	10
A. N. Coles	321	10	1
Wakeham Bros.	320	0	4

St. Jude Road Lane West.

Tozer & Son	121	17	6
E. Duke	107	17	4
C. L. Duke	92	10	6
Wakeham Bros.	92	0	11
T. Shaddock	91	10	10

Oakfield Terrace.

Tozer & Son	282	1	3
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C. L. Duke	563	15	8
E. Duke	535	12	0
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For Battle Bridge Drainage Works, for the Corporation of Reigate. Mr. F. D. CLARK, Borough Surveyor.

Streeter Bros.	£1,151	16	0
Hudson, Streatham Hill	1,021	11	7
Porter, London	997	10	0
Steer, East Grinstead	945	7	0
Bell, London	935	11	0
Cunliffe, Kingston	914	0	0
Jackson, Plaistow	850	10	0
Rayner, Romford	786	17	0
Lee & Sons, High Wycombe	733	19	0
Faulkner, Reigate	663	9	4
Pickthall, London	387	0	0
Borough Surveyor's estimate	700	0	0

RUGBY.

For Building Shops, Warehouses and Two Houses in Cambridge Street, Rugby, for the Rugby Co-operative Society. Mr. J. T. FRANKLIN, Architect, 40 Bridge Street, Rugby. Quantities by Architect.

Linnell & Sons	£3,424	0	0
Parnell & Son	3,420	0	0
Hollowell	3,330	0	0
Harris	3,320	0	0
Foster & Dicksee	3,300	0	0
Satchell	3,019	0	0
J. YOUNG (accepted)	2,970	0	0

SALCOMBE.

For Water-supply of Salcombe, viz. the Construction of a Pumping-station and Providing and Fixing a 6 Horse-power Priestman Oil-engine and Pump, and Laying of 9-inch Stoneware Collecting Drains, Construction of a Covered Reservoir and Increasing the Size of the Present Reservoirs; also the Providing and Laying of Cast-iron Rising and Supply Mains of 4-inch and 3-inch Diameter, together with Hydrants, Valves and Other Works Connected, for the Salcombe Local Board. Mr. F. BEESLEY, Engineer, 11 Victoria Street, Westminster.

W. C. Shaddock, Plymouth	£3,827	0	0
W. Trevena, Plymouth	3,148	0	0
Ford Bros., Wandsworth Common	3,120	0	0
Garton & King, Exeter	2,988	0	0
R. R. Facey, Taunton	2,943	0	0
Rabbich & Brown, Paignton	2,735	0	0
Ellacott & Co, Plymouth	2,699	0	0
Hughes, Sutton & Digby, Highgate	2,697	0	0
J. Dickson, St. Albans	2,693	0	0
J. & A. Steer, Aveton Gifford	2,606	0	0
Hawkins & Best, Teignmouth	2,604	10	0
W. JENKINS & SON, Leamington (accepted)	2,295	0	0

TURRIFF.

For Building Epidemic Hospital and Enclosing Walls near Turriff, for the Burgh Commissioners and Turriff District Committee of Aberdeen County Council. Mr. JAMES DUNCAN, Architect, Turriff.

Masons.

J. Paterson & Son	£820	0	0
W. Duguid	766	0	0
A. Massie	760	0	0
P. CHRISTIE & SON (accepted)	752	10	0

Carpenters.

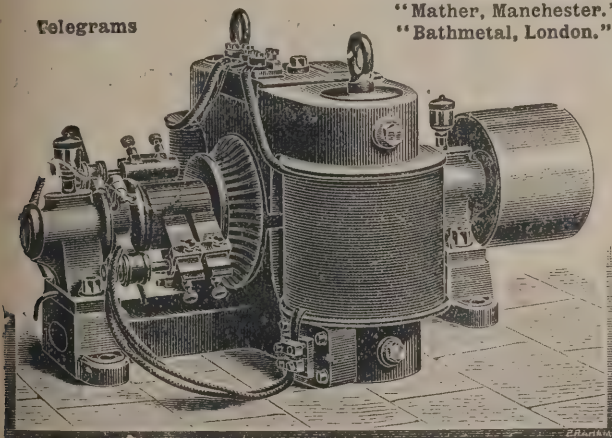
W. Fowlie	367	0	0
J. Shirran	359	10	0
W. Tennon	358	9	0
A. & W. HENDRY (accepted)	343	0	0

Plasterers.

J. Gibson	64	10	0
A. ROSS (accepted)	59	5	0

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Slaters.

S. Christie, jun.	£129	17	0
J. Gillespie	125	0	0
W. Liddell	123	0	0
J. Hutcheson	117	17	0
J. GAMMACK & Co. (accepted)	115	0	0

Plumbers.

S. Melvin	121	10	0
C. DUTHIE (accepted)	115	10	0

Painters.

A. Ingram	11	18	0
J. D. WATSON (accepted)	10	0	0

Architect's estimate, £1,370.

WELLINGBOROUGH.

For New Front and other Alterations to Shop in Market Street, Wellingborough, for Messrs. Finch & Denyer. Messrs. SHARMAN & ARCHER, Architects, Wellingborough.			
Hacksley Bros., Wellingborough	£209	0	0
J. Underwood, Wellingborough	182	0	0
R. Marriott, Wellingborough	180	0	0
E. Giles, Wellingborough	179	10	0
G. Henson, Wellingborough	174	0	0
W. STEVENS, Wellingborough (accepted)	159	0	0

WILLESDEN JUNCTION.

For First Section of Manufactory for the Rollason Wind Motor Company, Limited, Cumberland Park, Willesden Junction, Mr. W. H. FLETCHER, Architect, 13 Berners Street, W. Quantities by Mr. W. AUSTIN.

J. Allen & Sons	£585	0	0
A. Kellett	441	18	6
Hacche & Vovey	433	1	7
J. Easterbrook	431	10	0
J. Elkington	408	0	0
C. SIMMONS (accepted)	375	14	0

THE plans committee of Aberdeen Town Council have sanctioned plans of six large houses to be erected in Queen's Road South, the estimated cost being 10,000l. Plans of ten houses to be put up in Duthie Terrace were also passed, the cost of them being 5,000l.

TRADE NOTES.

WITH reference to the note last week on the new buildings to be known as the General Post Office North, the whole of the very handsome railing around which has been supplied by Messrs. Yates, Haywood & Co., of Rotherham and Upper Thames Street, London, E.C., we understand that the passenger lift in the main staircase, having a stroke of 62 feet, is a patent water-saving variable power lift made by Messrs. Easton, Anderson & Goolden, Limited, of 3 Whitehall Place, S.W., and Erith, who have also constructed three suspended lifts and two direct-acting goods lifts for that building. Similar lifts are being supplied by the above firm to the Royal Academy, Royal United Service Institution, the Commercial Union Assurance Company, Cornhill (two), Guardian Life Assurance (two), London and Midland Bank, Mr. J. Evitt Nash, Cadogan Square, S.W. (two); Mr. Bruce Clarke, M.D., Harley Street, W.; St. Pancras Vestry Electric Lighting Station, &c.; and their patent electric lifts to Messrs. Daw & Sons, Mr. McEwan, M.P., 16 Charles Street; the Eagle Insurance Company, Limited, Pall Mall, &c. They have also been instructed to provide the ten lifts and crane required for the new warehouses being erected for Messrs. Pawson & Leafs, Limited, St. Paul's Churchyard.

A SPECIAL exhibition of new designs and decorations for 1895 has been made by Messrs. F. Walton & Co., Limited, sole manufacturers of "Lincrusta-Walton," the Sunbury wall decoration.

WE hear that Messrs. William Godwin & Son, Lugwardine Works, near Hereford, encaustic and art tile manufacturers, have lately received orders for tiling the chancel and nave of St. Martin's Church, Hereford, and the chancel of Turner's Hill Church, Sussex; Hinton Church and Frocester Church, Gloucestershire. This firm particularly excel in the production of ecclesiastical designs and have taken great pains in reproducing ancient patterns, of which they have an admirable collection, and we have pleasure in stating that both in the excellence of manufacture and in the artistic quality their tiles are all that can be desired. We would like to mention that very fine pavements, the work of this firm, may be seen in St. David's Cathedral and Tewkesbury Abbey. Of the former, the late Dean, who took a great interest in the work, writes:—"Messrs. Godwin's tiles have been used extensively in restoring St. David's Cathedral. Messrs. Godwin were employed by Sir Gilbert Scott to copy the fifteenth-century tiles in the

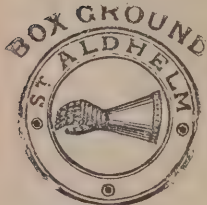
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presbytery and in the choir of the cathedral, and to reproduce them, which they have done most successfully. In fact, I am glad to be able to express my entire satisfaction both as regards the appearance and the wear of Messrs. Godwin's tiles."

MESSRS. GEORGE PRICE, LIMITED, Wolverhampton, write us in connection with their new bending machinery:—We have just completed our new hydraulic plant, and are now making all our safes with the top, bottom and sides bent solid at all corners out of a single steel plate from $\frac{1}{4}$ to 1 inch in thickness, according to the quality of the safe. We believe this machinery is the most powerful ever used in the safe trade, and there can be no doubt that the safes turned out by it are the most perfect ever introduced. We are also introducing new patterns in iron doors, and have put down plant specially for this branch of the trade, with which we hope to be able to take a large share of this work.

WE learn that the Incandescent Gas-Light Company, Limited, have received an order from the India Office to instal their system in all the departments there, this decision having been arrived at after a prolonged trial of a few burners.

WE hear that Messrs. E. H. Shorland & Brother, of Manchester, have just supplied some more of their patent Manchester stoves to the Clayton Hospital, Wakefield, those previously supplied having proved very satisfactory.

THE following, dated December 15, 1894, has been received by Messrs. George Price, Limited, from Mr. John Melior, of Manchester:—During the destructive fire at my warehouse or the 11th inst., two of your safes (one purchased from you thirty-five and the other twelve years ago) perfectly preserved the whole of their contents, consisting of books, deeds, papers, &c. The safe purchased from you thirty-five years ago is the one which successfully resisted an attack by burglars some time since.

A NEW illuminated Cambridge quarter clock has been fixed in the parish church, Monk Bretton, Barnsley, in memory of the late Mr. Thomas Marsden, by his nephew, Mr. James Marsden, of Sheffield, the whole having been made and erected by Messrs. Wm. Potts & Sons, of Leeds and Newcastle-on-Tyne.

PLANS have been prepared for the erection of a new public bath at Walsall, the cost of which is estimated at about 7,500*l*.

BUILDING AND BUILDERS.

At the meeting of the Golcar School Board the plans for proposed alterations and additions to the Knowl Board School and a proposed new infants' school and board-room adjoining were finally approved. The plans had already been approved by the Education Department. The schools, when completed, will provide accommodation for 407 children. It was also decided to advertise for tenders. Mr. J. Berry, 9 Queen Street, Huddersfield, is the architect.

THE Empire Theatre, Southend-on-Sea, has been destroyed by fire. Mr. F. Marlow, late of the Eastern Empire, Bow, purchased the property about a year ago, and spent a considerable sum in improving the building, which was insured for 4,000*l*.

THE sum of over 1,700*l*. has been received by Mr. W. Quarrier to build another cottage house in the national group of Orphan Homes of Scotland at Bridge of Weir, in memory of the late Mr. Ebenezer Dean.

THE death is announced of Mr. William Staple, builder, of Helston, in his sixty-fifth year.

SPEAKING of the church at Eccles-next-the-Sea, the *Norwich Mercury* says:—The old steeple had a rough time of it during the late gales. The sea has washed away large portions of sand, leaving the tower yet more isolated. At high tide the base has been submerged in 10 feet of water, the waves reaching at times half-way to the summit, and portions of the walls of the church adjoining the tower at the top of the arch being detached. Mr. G. Wilkinson, of the Castle Farm, with a view to its preservation, has caused the base of it to be cemented, especially those parts where the outer casing of faced flints has been removed. The beach has not been scoured so much as in some gales, but enough sand has been removed to allow some portions of the ruined nave and chancel to become visible.

THE County Clerk for Sutherland has received intimation that the Secretary for Scotland will recommend the Board of Trade to sanction the lengthening of the pier at Golspie, at present being constructed there, and in the event of the Board of Trade approving, the Treasury will be asked for 300*l*. of an additional grant.

THE Edinburgh Town Council have remitted to the Lord Provost's committee the question of cabling the tramway system of the city.



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THE Government have decided to erect a new fort at St. Anthony's Head, opposite Falmouth Harbour. It will be of a much more formidable character than the fort at Pendennis Castle, on the Falmouth side of the harbour, and contracts are already out for work involving an expenditure of 111,000*l*. Several acres of land have been marked off for the purpose. The construction of the new fort is expected to give employment to hundreds of men for a considerable period.

THE parish church of St. Columb Major, near Truro, was struck by lightning during the evening service. The tower was first struck, and the current travelled down the belfry and central aisle. The belfry was completely wrecked.

ELECTRICAL.

AT the meeting of the Manchester Society of Architects on Tuesday, the 8th inst, Mr. E. A. Claremont (F. H. Royce & Co., Limited) read a paper on the subject of electric lighting. He stated that the demand for electro motors would within the next few years in all probability increase enormously, owing to its having been lately demonstrated that in works where steam power is for driving purposes transmitted long distances and subdivided by the use of many small engines, considerable economy in coal can be effected, sometimes even to the extent of 50 per cent. By the use of electro motors not only is the great loss caused by condensation avoided, but the motors are so convenient to manipulate that they permit of the energy being absolutely cut off when necessary. The economy effected by such a system would be so great as in many instances to save the expenditure of the plant within a few years of purchasing.

THE Liverpool Corporation have under considered a proposal of a special committee that they should be authorised to try to arrange for the acquisition of the Liverpool Electric Supply Company's undertaking. The recommendation has been adopted.

THE electric-lighting committee of the Stafford Town Council having recommended that the tender of the Electric Storage Syndicate should be accepted for the construction of the accumulators at a cost of 822*l*.; also that one of 524*l*. 18*s*. from the Electric Construction Company (Wolverhampton) be accepted, the recommendation has been agreed to by the Council.

THE Aberdeen Municipal Buildings are to be lighted by electricity, and the tender of Messrs. New & Mayne, amounting to 200*l*., has been accepted. The Town Council also sanctioned the acceptance of the offer of Messrs. J. H. Holmes & Co., Newcastle-on-Tyne, for the supply of additional engines, dynamos, steam and exhaust pipes, &c., in connection with the electric-lighting station at Cotton Street. The cost of the new apparatus is 3,270*l*.

THE first of the Cantor Lectures at the Society of Arts will be delivered on Monday, the 14th inst, by Professor Silvanus P. Thompson, D.Sc., F.R.S., on the "Discovery of the Electric Arc Light, Early Experiments, the Physics of the Arc," &c.

AT the next meeting of the Walsall Town Council the following tenders will be submitted for acceptance for the carrying out of the electric-lighting scheme:—By Thomas Parker, Limited, Wolverhampton, for supplying plant (except mains) for the generating station, for the sum of 5,611*l*.; by the Callender Bitumen Telegraph and Waterproof Company, Limited, London, for supplying and laying down the electrical mains, for the sum of 4,000*l*.; and by Mr. H. Gough, Wolverhampton, for constructing a generating station at the Wolverhampton Street Gasworks, for the sum of 1,750*l*.

THE Surveyor of the Llanelly Local Board has just prepared a report upon the probable cost of electric light for the market in place of gas. He says that unless some of the tradesmen of the town also agree to go in for the new illuminant, a scheme for its introduction could not be carried out. Circulars have now been addressed to the principal tradesmen asking them whether they are prepared to adopt the change.

VARIETIES.

ON account of the success of the exhibition of artistic posters at the Royal Aquarium, Mr. Edward Bella, with the assistance of the honorary committee, has, by permission of the directors, increased it by about sixty additional posters, many of them by English artists. Examples are now shown by Sir James D. Linton, P.R.I., Chas. Green, R.I., Fredk. Barnard, Walter Crane, Linley Sambourne, Herbert Schmalz, Aubrey Beardsley, Mrs. Dearmer, A. Morrow, F. Simpson, Dudley Hardy and Professor Anning Bell. The famous original design for the poster of "The Woman in White," by the late Fredk. Walker, A.R.A., that has excited so much admiration in the foreign press, is still on view, and the numerous unpublished designs

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for posters by English artists only prove that for originality and boldness our countrymen are beginning to show to advantage, even when contrasted with some of the brilliant colourists of foreign schools.

THE scheme for putting Sheffield in direct communication with the sea at Goole by means of wide deep canals is taking practical shape.

AN inquiry has been held by the Local Government Board, at the Solihull Workhouse, into an application made by the local authority for powers to borrow 1,000*l.* for works of sewage at Olton.

THE Japanese Government have decided to construct a new railway, 110 miles long, from Hiroshima to Shimonoseki, with one or two branches, and are prepared to receive tenders for material and locomotives. These latter are to be of the leading bogie type, about 45 tons weight in working order. The cost of the line will be about three million dollars.

THE Great Northern Railway Company are testing a novel method of warning the public at level crossings by means of a neatly contrived piece of mechanism. When an approaching train is within a certain distance of the crossing the engine in passing causes the mechanical device to be operated, thus giving an instantaneous ringing of a bell affixed at the crossing. The method is now in use on a portion of the Hatfield and Dunstable branch, and so far seems to be working satisfactorily.

AT the meeting of the Institution of Civil Engineers of Ireland—Mr. James Price, president, in the chair—the president, in opening the proceedings, thanked the members of the Institution for electing him their chairman for the ensuing year. Papers were read on "Damage to a Three-inch Main by Electric Discharge," by Mr. H. C. Moore, C.E., communicated by Mr. Charles P. Cotton (past president), and "Distinctive Features and Advantages of American Bridge Practice," by Edward Barrington.

It has been decided to erect a chancel to Oldwindsford Church, Stourbridge. The cost of the work has been estimated by Mr. Chatwin, architect, of Birmingham, at about 3,000*l.*

THE medical officer of health for Stockport, Dr. Porter, refers in a report just presented to the Corporation to the sewerage works now in progress and to the means adopted for sewer ventilation. The scheme now being carried out under the supervision of Mr. A. M. Fowler, M.I.C.E., at a cost of about 100,000*l.*, provides for five main intercepting sewers,

which are to be ventilated by openings in the carriage-way and by shafts on buildings, away from windows.

THE first number of the *Staffordshire Advertiser* was published on Saturday, January 3, 1795. A facsimile of that number has just been presented to the subscribers of that paper on occasion of the centenary. There are no allusions to architectural or building matters. We find, however, the following paragraph:—"It is said that the experiments for draining land, on the principles of a Warwickshire farmer, respecting which a committee of the Board of Agriculture, consisting of the Duke of Bedford, Sir Joseph Banks, Mr. Fordyce, &c., met at Woburn, are likely to succeed in a manner that will much promote that great means of improvement."

AT Bridgnorth an inquiry has been held by the Local Government Board relative to an application of the Town Council to borrow 5,000*l.* for the purpose of erecting dwellings for the working classes, under the Housing of the Working Classes Act 1890, and for approval of the appropriation to the object of certain corporate land and funds.

AT the meeting of the Cardiff School Board, the recommendation of the sites and buildings committee for the purchase of the two houses adjoining the higher grade school for 2,500*l.*, that they might be utilised for Board offices, the leasehold and reversion to be purchased, and a pupil teachers' school, gymnasium and workshops erected at the back of the house, was adopted. The plans were approved, subject to modification hereafter, and Messrs. Jones, Richards & Budgen were appointed architects.

THE North Berwick Town Council and Police Commissioners have resolved to proceed at once with a scheme of alterations and improvements on the existing drainage system of the burgh, at an estimated cost of 1,300*l.*

AT the meeting of the members of the West Riding County Council, the general asylums committee was given power to purchase, if they thought fit, land at Burley-in-Wharfedale, on which to erect an asylum for private patients.

THE committee of the Walsall Town Council recommend an application to the Local Government Board for power to borrow when necessary a further sum of 50,000*l.* for the purpose of the gas undertaking, the present borrowing powers of the Corporation being nearly exhausted, and to approve of the laying of an independent gas main from the Pleck Gasworks to the Wolverhampton Street Gasworks, at an estimated cost of 792*l.*

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NOTES ON NOVELTIES.

WE are informed by Messrs. Marion & Co., Soho Square, that they have just issued a new form of hand camera, "The Persé." The use of celluloid films is largely on the increase, as for tourists it saves the weight and space of glass. The Persé film camera is designed to carry fifty to seventy sheets of the prepared celluloid film, of any make; and not only that, but the traveller who, having exhausted his stock of the correct size, yet having some of larger sizes, or even glass plates, may readily extemporise a new supply, which would be utterly impossible with the other forms. The few and simple mechanical operations required by the Persé are such that anyone with ordinary care can properly perform them; and the portability of the camera, from its light weight and small bulk, is such that it can be used anywhere. It is quite unnecessary for the operator to be acquainted with the chemical part of photography. The Persé is a well-seasoned mahogany case, covered with hard-grained black morocco, and having no other projections than those shown in illustration on the side—the finder being hinged so as to fold into a recess at the bottom, where it is held by a spring fastening. Inside it is fitted with light metal mechanism for holding before exposure and storing after exposure the thin sheets of celluloid film which carry the sensitive preparation. Behind each of these sensitive films is a "backing" sheet of a slightly different size. These are held by pressure springs in position for exposure against a series of catches operated from the outside by a lever, which, when raised, liberates a film, and on being lowered allows one of the backings to fall. This is automatically recorded by the visible index at the side. In the Persé any ordinary make of film can be used, which is an immense advantage over those cameras which require the edges to be specially notched, or in flimsy rolls. The Persé may be charged with one film at a time, or any number up to 70, and with-

drawn with equal ease in the same manner, or *en masse* as desired. If more than fifty are put in, then some must be removed from the receiver after exposure, for it will not hold more than fifty, but the top or reservoir part will take seventy. Letters showing on the outside indicate the inside conditions of certain parts. The Persé is fitted with an excellent rapid rectilinear lens with f.8 aperture and rotating stops. In front of this is a time and instantaneous shutter which always retains the same relative position to the lens. Both the lens and shutter are fixed on a "rising" and "cross" front. Focussing is done by moving an index lever over a graduated scale. After fixing the lens in the Persé the focus is tested for various measured distances from 6 feet to infinity, and the result obtained is marked on the scale referred to. By this means any object between 6 feet and infinity can be instantly focussed, which is impossible with lenses of fixed focus. The door at the front is hinged, and can be opened in a moment to alter the speed of shutter, diaphragms, or adjust the rising front. The lens aperture is covered with a square hinged lid which keeps out dust from the shutter and lens, and also gives the Persé a neater appearance. Sockets are sunk in the bottom and side of case to enable its being attached either vertically or horizontally by a screw to a tripod. A handbook on the Persé has been published by Messrs. Marion & Co., which gives very clearly full instructions on the use of the camera.

THE new window, which is the invention of Mr. Lanham, of Sawbridgeworth, Herts, presents some excellent features. In the first place it can be cleaned from the inside. The window is of swing form, the sash turning on a horizontal axis, and being capable of turning completely round, either face of the window can be situated at the inside. This complete reversal is a point of special importance. An automatic catch retains the sash in a closed position, and a further catch of special construction fixes it in any position, whether open or closed. This invention deserves consideration from architects and others.

THE plugs of washhand basins have been a great nuisance because they sometimes get mislaid, and they frequently fall into the basin and stop up the outlet, necessitating the user putting his hand into the soapy water to fish out the plug. The patent which we illustrate herewith gets over all this, and is very convenient in use as well. The engraving shows Winn's back-outlet "Washington," with patent chain, manufactured by Messrs. Charles Winn & Co., of Birmingham. It shows an

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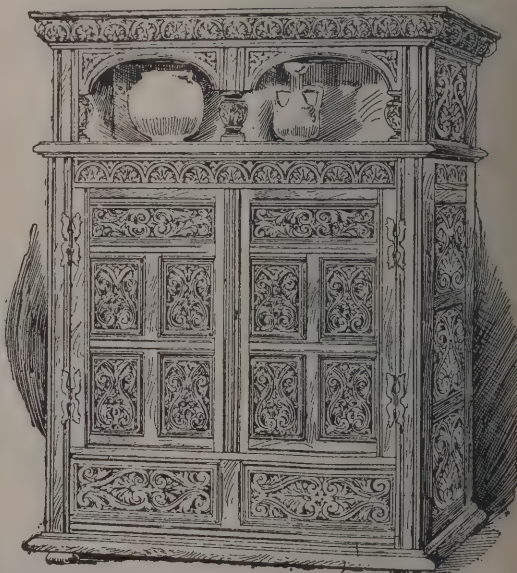
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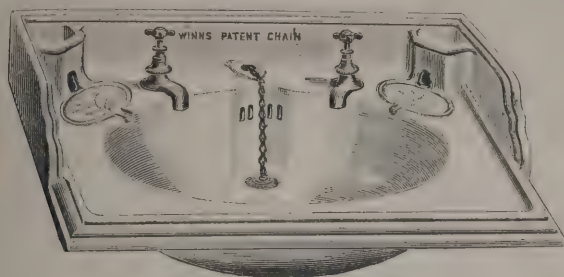
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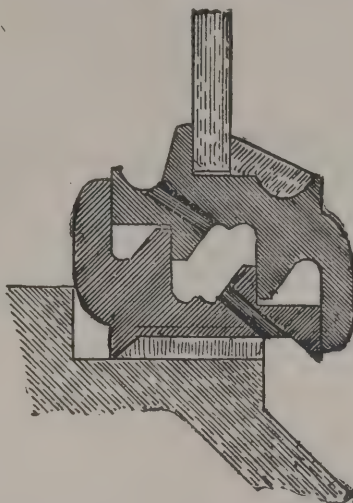
arrangement by which the chain is passed through a suitable hole in the flat part of the lavatory and is weighted at the end, the effect being that so soon as the rubber plug is released from its socket the chain passes through the hole out of sight, and the rubber plug is held on the top of the slab, thus preventing the annoyance of picking it out of the basin, where it frequently



falls in the ordinary way, stopping the free discharge of the water. The particular shape of the basin, which is vertical at the back, thus providing the greatest depth where most required and thereby economising water is another advantage, while the user has more space under his elbows than can be obtained in the ordinary form. The outlet and overflow being recessed into the back, the plug and chain are entirely out of the way of the hands. When the lavatories are required complete with cocks there is an extremely neat pattern of screw-down valve for hot and cold water (registered), having handsome spoke top and complete with fly-nut and union for connection to lead pipe, with a full way plug and washer complete (with patent chain), at a very reasonable addition to the price of the lavatory.

Impervious Casements and Frames. — A thoroughly waterproof and universally applicable section, known as the Impervious No. A1, for metal casements and frames of all kinds, has been patented by Mr. Arthur W. Adams. The convenient and neat form and simplicity of detail of the section will at once recommend itself, while it gives strength and rigidity. This Impervious section is suitable alike for casements or windows opening on hinges or centres in any direction, or for fanlights, ventilators, hoppers, &c, while for meeting casements or doors without a centre mullion it is invaluable. In regard to the fixing, it is worth noting that this section will

accommodate jambs of stone, wood, &c, of any detail; the grooves or plugs usually prepared in stone jambs for fixing may be dispensed with, in which case a series of gaps is provided along one of the projecting ridges of the fixed frame, so that cement or other suitable fixing material previously applied to the stone rebate will flow through and form a key behind the section when it is pressed into its place. This will also make a draught-proof fixing. In the Impervious No. A1 section there are four surfaces of contact, the true fitting of each one being insured by using the same detail for the sash as the frame. The



members serve materially to strengthen and stiffen the window, a most important consideration. A condensed water channel which collects and diverts interior moisture is provided, and a groove for affording a good hold for the putty. The Impervious section makes a splendid sill or water bar for wood casements opening in or out, or for weatherproofing bad joints. These superior casements, which have been highly spoken of and used for the best work, are made of the best material and well finished by Mr. Robert Adams, No. 67 Newington Causeway, London, S.E. The prices are kept quite moderate, to enable these casements to be adopted everywhere.

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SANITARY APPLIANCES.

WE recently paid a visit to the works of Mr. Milton Syer, of Rye Lane, Peckham, and a short account of a few of his excellent specialties will be of interest to our readers. The engravings No. 1 and No. 2 show the patent "Reliable" joint. This is a simple way of securing a reliable and effective joint without the rigidity of other methods, which are subject to breakage owing to settlement of the work or any slight strain. There is in the "Reliable" an

FIG. 1

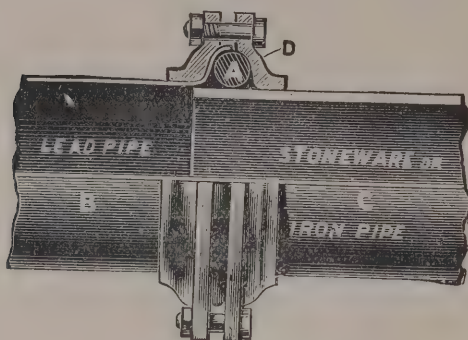
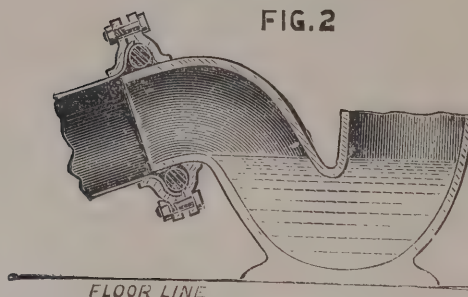


FIG. 2



amount of elasticity which gives a certain movement or play, thus counteracting any effect of settlement or strain, and unbreakable, and forming a perfect water and gas-tight joint. In

fixing the joint the *modus operandi* appears to be that one iron ring is passed over the trap, then the indiarubber ring is sprung on, and lastly a second iron ring is passed over the lead soil pipe, which is tafted so as to form a shoulder, the bolts are put in, and the whole screwed up tight together and the work is complete. Among other appliances manufactured at the Hanover Works are several kinds of cisterns, all excellent. Among them is the "Peckham" syphon cistern, some 80,000 of which have already been sold, and which received a medal at the Inventions Exhibition. It has great flushing power, and flushes well at a low head of water. The flush is certain whether the lever is held or not. Valves—excepting ball valve—rubbers, washers, &c., are entirely dispensed with, avoiding any chance of getting out of order. The patent "Hanover" is an improved syphon cistern, meeting the requirements of the water companies as a perfect water-waste preventer, and passed by the Kent Water Company. The inner flush pipe stands over the water-line and overflow. The syphon cannot be started unless the lever is pulled and allowed to fall again. The handle, if held down,

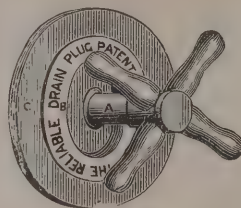


FIG. 3.

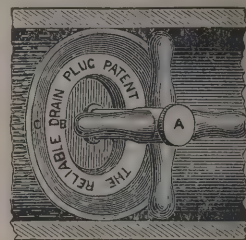


FIG. 4.

does not allow water to pass. It is claimed as one of the simplest and most efficient cisterns in the market. There are no seatings or valves, or anything to get out of order; also, the syphon is easy of access. The "Reliable" or electric flushing cistern is very simply put in action by pressing a button, for which no extra battery is required if electric bells are fitted in the building. Levers, chains, wires, &c., are dispensed with. There are no moving parts, and the action is perfectly silent. The "Peckham" is an automatic flushing tank for latrines, drains, urinals, &c., eminently adapted for public purposes. There is also the "Peckham" urinal flushing cistern,

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automatic in action. As a self-flushing cistern it is very excellent, and simply constructed with absence of all mechanism to get out of order. The flush can only be set going by use of the urinal, so it perfectly prevents all waste of water. The "Universal" is another excellent appliance as a syphon cistern. The engravings, Nos. 3 to 6 inclusive, show the "Reliable" drain or pipe stopper. All screwing and expanding of rubber rings is dispensed with. This plug pressed into the pipe becomes a fixture and perfect tight seal at once without any further attention; the greater the pressure exerted on it the tighter it will hold. To release it



FIG. 5.

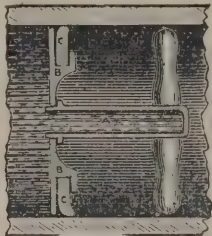


FIG. 6.

the capstan handle A must be unscrewed and withdrawn, when, after the water has been allowed to escape, then the plate B with rubber flange C can be withdrawn and the handle replaced, leaving it ready for the next test. Can be made in any size required to order. This plug will be found very useful for testing cast-iron pipes and stopping gas mains under repair. If desired, the capstan handle can be supplied with a screw-cap so that a tube can be attached to it. No. 3 shows an elevation of the "Reliable" plug, No. 4 represents the plug inside of drain-pipe, No. 5 shows the plug with capstan handle removed, No. 6 is the section of the plug inside a drain-pipe. A is capstan handle, B the double-flanged plate carrying the rubber flange C.

THE resuscitation of the Cheltenham Spa is proposed, and the borough surveyor has prepared a sketch-plan of a small pump-room and suitable adjuncts at the north corner of the Montpellier Gardens, the cost of which he estimates at about 3,500/.

PHILÆ AND THE LOW-LEVEL DAM.

A CORRESPONDENT of the *Times* in a communication to that journal writes:—

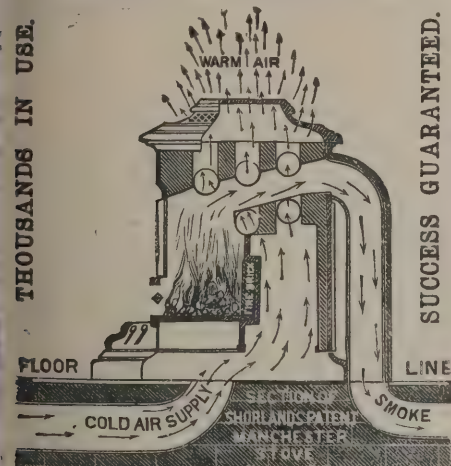
Sentiment prevails over utility so rarely in the present age that its triumph in the matter of Philæ calls for more than passing remark. The lay protests of artists, archæologists and amateurs of things beautiful have won the day, and the immediate construction of a storage basin, sufficient for the whole of Egypt, is renounced definitely out of regard to the monuments it would submerge. The final proposal of the Ministry of Public Works has reference only to a low-level dam to be constructed at the Assouan Cataract, with a view to holding up water sufficient for Middle Egypt in a bad year, and for part of Lower Egypt also in a season of high flood. A pious hope is expressed that this may be supplemented ere long by a second dam in the Northern Soudan; but nothing is contemplated definitely beyond the Assouan barrage, which will be 26 feet lower than the high-level one proposed originally, and, it is said, so constructed that all possibility of its being heightened at a subsequent period will be precluded.

The triumph of sentiment is the more remarkable since certain of the protests put forward last spring and summer on its behalf were weakened materially by insufficient knowledge on the part of the protesters. Those, for example, who pressed the claims of a dam at Kalabsheh against one at Assouan, on the ground of the very slight excess of its cost, spoke in ignorance that the International Commission of March last had declared the difference to be nearly one million sterling. And we learn now that the technical advisers of the Government insist that one at least of the storage reservoirs must be removed from the districts to be benefited not further than the cataract, in view of the immense waste of water by evaporation and infiltration which must be reckoned with were the distance greater. Wisely, however, the spirit of the protests has been regarded in Egypt rather than their expression. The technical advisers have changed their policy, perhaps with no great reluctance, for it is an open secret that many of those most concerned with the reservoir schemes were neither Philistine at heart nor anxious to put their hands and names to a deed which many would be found in all ages to regret.

The outcome is, of course, a compromise, and the out-and-out advocates of utility and sentiment are called upon to make mutual concessions. Certain details are undetermined as yet, and will be referred to expert opinion, but enough is settled for

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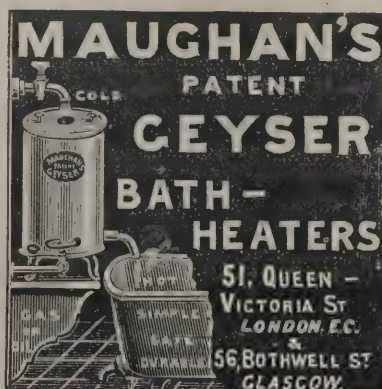
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it to be possible to judge how the "sentimental" outlook now stands. Two chief points are established: the Temple of Isis is to be touched in no part by the waters, and all the Nubian temples above Philæ will be well above the highest level of the new lake. The "sentimental" question, so far as one remains, concerns only the lower-lying buildings on the Philæ Island, and its general aspect (for no one would put forward the *graffiti* on isolated rocks as monuments of sufficient importance to be taken seriously into account). It now appears that, for rather less than two months of every year (March and April), the Temple of Isis will stand reflected in the surface of a lake, washing to within a very few feet of the base of its walls. To the south the colonnade will be dry, except, perhaps, at its extreme end, where the earliest of the Philæ builders, the magician Nectambo, erected a shrine to Hathor. Here a thin film of water will soak among the fallen blocks and over the top of the quay wall. North of the temple, most of the labyrinth of brick constructions will be submerged, and nothing will show conspicuously on the eastern side except the shafts, abaci and architraves of Pharaoh's Bed submerged nearly to the top of the intercolumnar screen. The whole northern and eastern quay will be deep under the surface, but at the south-eastern corner the rock rises and will preserve a group of brick buildings.

The full effect of the submersion of what is to be submerged cannot be estimated until submersion has taken place many times. There will remain, of course, every spring, a coating of slime, but it will be as easy to wash this away at Philæ as now at Luxor and Karnak. The brick structures, it is to be feared, will have vanished utterly wherever reached by the flood. Their value is rather scientific than artistic, and will be estimated very variously. What, however, of important stone structures like the quays and Pharaoh's Bed? On the safety of the south-western quay wall depends that of the western colonnade; it is rickety at present, but would be underpinned, clamped and strengthened in every possible way before the basin was filled for the first time. "Pharaoh's Bed" is too solid to be endangered by the mechanical action of the water; but, like the other structures, it may suffer seriously from chemical action. There would not be in it or in any other building paintings of much merit within reach of the highest level, or even of the damp, which, as at Karnak, would creep up some feet higher than the surface of the lake; but, unfortunately, Nile salts can disintegrate matter more solid than pigments. Their evil work, slow but sure, can be seen at Karnak, in the eroded bases of pillars and scaling of all surfaces below the flood mark. The Philæ

water would doubtless be less impregnated, being stiller, deeper and drawn off granite, and would do its work of destruction even more slowly than at Karnak; much, too, might be effected by judicious washing after the flood or coating the exposed surface with some transparent composition before the basin was filled.

The danger from salts has prompted an official suggestion that watertight walls should be built round the monuments lying below high water mark, or one such wall round the whole island. In this case prevention would seem worse than cure—worse even than disease. The lake will endure for a season, the wall always. The chief glory of the island, its general effect from the further bank of the Nile, would have been ruined for ever. Philæ would be no longer the Philæ of indelible memories of sunlit columns and towers set in a frame of leaning palms, dark waters and fantastic crags; it will have sunk to a dreary museum of antiquities. In any case, if no wall be built, a few more generations will be able to enjoy as of old one of the most matchless views in the world; then, if it must be, let the buildings crumble. The men of science will long ere this have unlocked all secrets and published all details. Why preserve for their sake what they will care little for by the destruction of all that made it worth preserving for the rest of the world?

In all this matter of the preservation of Philæ science has been considered too much and sentiment too little. The out-and-out archaeologist has really very little interest in the question. When he has planned, copied, drawn and photographed a building he wishes to pull it to pieces and dig in its foundations; like a botanist, he learns more by dissection and uprooting than by conservation. He would have gained, rather than lost, by the once proposed transportation of the Temple of Isis to the island of Bigeh; he will gain now by the justification afforded him for digging out the brick constructions down to the old level of the island more than he will lose by their eventual solution in the flood waters. The "sentimentalist" it is—he whose æsthetic and religious senses are developed strongly—who has the most real interest in the preservation of the monuments of Philæ, together with the general character of their natural setting. If no wall be built he will see the island still in December and January much as of old, and in February as it appears now at High Nile. Science can surely minimise the destructive power of the salts; at the worst, from time to time the rotting stones of the lower courses can be replaced by new, and even sculptures reproduced, as is done again and again on our own Mediæval monuments. The Ministry of Public Works professes its willingness to do

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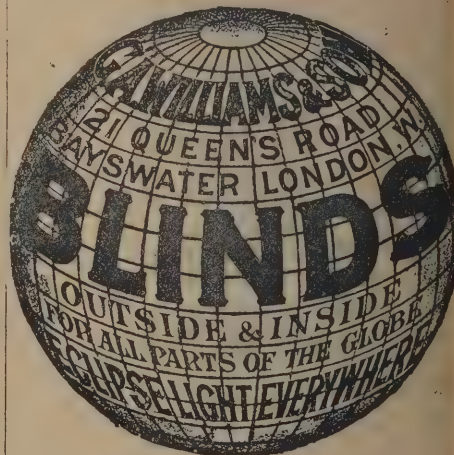
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all that is humanly possible; it is to be hoped that they will make provision for the up-keep of Philæ as well as for its present consolidation. If that be done it seems that archaeology and sentiment may be satisfied under a scheme which spares entirely the Isis Temple and colonnade and condemns to absolute destruction only the brick constructions, whose value, being wholly scientific, could be realised in full before their disappearance. In fact, the proposal of the Ministry includes so thorough a preliminary survey and exploration of the island that science proper will be able only to be grateful.

The further project of a survey of Nubia, announced lately, will result also in an incalculable gain to archaeological science, since exploration on all the ancient sites is put forward as an integral part of the scheme. It is devoutly to be wished that no *odium archaeologicum* may prevent all the best Egyptologists and explorers from responding to the generous invitation of the Government when it is formally made. But this scheme and the Philæ question are things wholly apart; the preservation of the monuments on the island is less the interest of archaeology than of sentiment; and the character of Philæ is so unique that it cannot be classed with any number of mere relics of antiquity. If its value is sufficient in itself to outweigh all the claims of present Egypt, neither would it be lessened nor the claims increased by the introduction into the balance of the Nubian temples. In connection with this and future schemes of water storage, a Nubian survey has become imperatively necessary, and its prosecution affords a singular opportunity for archaeological exploration *pari passu*; it is much to the credit of the Ministry of Public Works that it has recognised this fact so promptly and made so munificent an offer. Under the original scheme this proposition might have passed for a bribe to science; in view of the modified proposal it is a piece of laudable generosity.

IRISH HANDICRAFTS.

In the course of a paper in the *New Review*, the Earl of Mayo writes *à propos* of the forthcoming exhibition:—

A great deal of cabinet-maker's work is done in Dublin; in fact, I may say the trade flourishes, but the curse of Chippendale is over it all, or rather Chippendale, with extra Liffey Street inlaying. One's heart sinks when one sees year after year the same patterns produced and reproduced. Yet in

many cases the work is excellent and the carving good. One asks why this continual iteration, and one is told the public will have it; it is the fashion. I do not object to an adaptation of Chippendale, but I do object to Chippendale redecored. I have seen a beautiful piece of modern carving in Liffey Street, and have also seen small tables well and strongly made, adapted, it is true, from an old design. I have also seen a screen, with figures inlaid in the top of the panel, which showed a certain amount of originality. The secret of all this want of original design lies in the fact that designers of every sort are scarce in Ireland. If our country produces a good one he goes to England, as he would starve here.

Yet we have artists and amateurs who are able to design. I appeal to them to make a few original and simple designs for chairs, cabinets, and small tables. I am sure my old friends in and near Liffey Street will take pleasure in carrying out these designs. I hope the trade will not be offended by these remarks. I wish, in a humble way, to suggest the need for a large change. The Dublin cabinet-makers produce excellent work, which commands good prices, but their work is lacking in originality. People with taste can help them. Some do; I wish more would.

The next item on our schedule is cast-iron. One's thoughts are here instantly associated with kitchen ranges and sewer gratings. There are many foundries in Dublin, and although the possibility of artistic work in cast-iron seems small, let me point out that firebacks of bold design, strong, simple, effective railings and gates, and even fire-dogs can be produced in cast-iron. An exhibition might be overwhelmed with productions of cast-iron; but I trust my suggestions here will produce something worthy of the Dublin foundries.

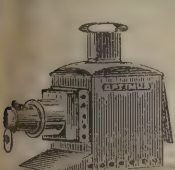
Embossed leather I dismiss with these words, in this country it is entirely amateurs' work. There is just one gentleman in Dublin who is an adept in the craft. Germany is the country where this work is produced in perfection.

Next comes embroidery, lay and ecclesiastical, on silk, linen, or any other material. Here we are more at home, as Ireland produces some fine embroidery. Let me instance the ecclesiastical embroidery done in the Convent of Poor Clares, Kenmare, and especially their adoption of old Celtic designs for modern needlework. There is a school of art needlework in Dublin (Clare Street), which does good work, and the school is making money; also I may mention a centre of needleworkers at Strabane, celebrated for white embroidery on linen. In this, as in other arts and crafts in Ireland, a lack of good

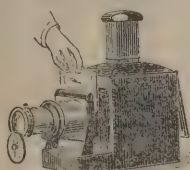
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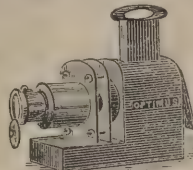
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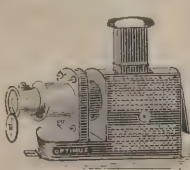
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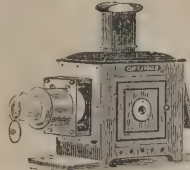
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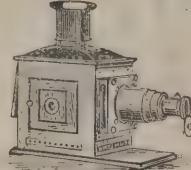
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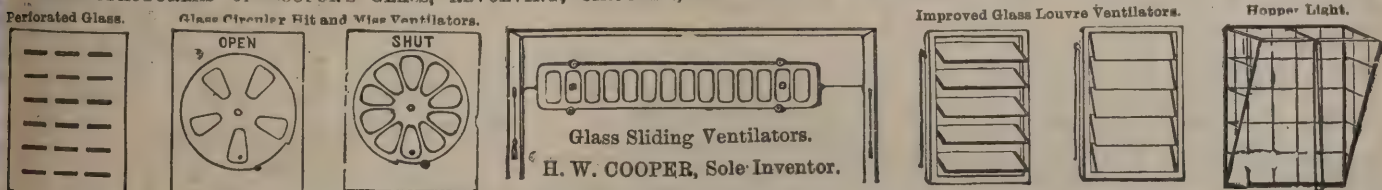
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designers is felt, especially in those conventional designs so suitable for hangings and curtains, which are seen in their best form on old Italian embroideries. One becomes a little tired of the shamrock—as an emblem excellent, but combined in a design decidedly wearisome. I feel that at our exhibition we shall have an excellent and brave show of embroideries of all kinds.

Next is engraving, lithography, and the various processes for book illustration. Here the workman is in touch with the artist, as wood-engraving gives every opportunity for the best work. There is one wood-engraver I know of in Dublin. As for the other processes, we shall expect a fine exhibit of this from Marcus Ward, of Belfast.

Zincotype work is well done in Dublin. Here again the connection of art with industry is observable; the better the drawing the better will the process do justice to it. In gesso, stucco and sgraffito work, at present only stucco work is done in Dublin. I am promised good designs, and one of our Dublin firms have said they will carry out these designs. The schools of art throughout Ireland should give us some stucco work, either finished or in design.

We have next gold and silversmiths' work. Here visions of old Irish plate rise up, perhaps to taunt one, epergnes, cups, and the rest, all beautiful, graceful and of excellent finish. Is there, then, no good plate made in Ireland? Yes; but the good and defunct Queen Anne must lend the style to our modern silversmiths. In plate she is the fashion, and so our silver workers go on copying. If an original design is produced it is over-decorated. Some of the presentation pieces of plate one sees in the shop windows in Dublin add a new terror to the recipients' attempts at making a speech on being presented with them. The workmanship is excellent, well finished and well carried out, but the same article can be seen in the London shop windows. When remonstrated with the maker will say, "People will have their money's worth. If we do not put in plenty of chasing they think they are not getting full value."

Instead of centre-pieces, football cups, and bicycle racing cups, I hope we may see at our exhibition some useful pieces of plate. They can be made, and made artistically—salt-cellars, coffee-pots, tea-pots, sugar bowls of simple design, one or two not over-elaborated epergnes, a good plateau, and a well-designed racing cup. I am perfectly certain that these, if not exhibiting vulgarity in detail, would be sold the first day the exhibition opened.

Hammered Ironwork.—There is no fear of a want of good

exhibits in this craft. There are two excellent workers in hammered iron in Dublin. I need only mention that the gates of the courtyard of the Science and Art Buildings were made in Dublin, and at a very moderate cost. In fact, we may feel proud of this craft as carried out in our capital.

Lace-Making.—Irish lace is known all over the world, and of late years has been commanding good prices, owing largely to the better designs introduced into this art by the efforts of Mr. Alan Cole, of the South Kensington Museum, who was sent over by the Treasury to visit the different centres, and to criticise and advise. He was equipped with examples of the finest old lace from South Kensington. This good work was continued by Mr. James Brenan, of the Metropolitan School of Art, Dublin. The Irish Industries Association are at present introducing new designs, especially in Carrickmacross laces. In this exhibit, which is sure to be excellent, will be seen the effect of good design, without which the craftsman may toil in vain.

Poplin.—Irish poplins bring visions of beauty adorned with richest grace of drapery. There are many poplins now made in Ireland with effective designs, which we trust will be forthcoming at our exhibition. Poplin has lately been made lighter, so as to drape in more graceful folds.

Porcelain and pottery come next on our list. As for the former, Belleek produces good china; but here, again, good designs are wanting. Those shell-like tea cups are no doubt delicate and almost pretty, but they are not useful or artistic. The Belleek glaze has a wonderful lustre, and would be effective if applied to designs and articles to which it is suitable. In the Dublin shop windows one perhaps only sees the plainer, merely pretty, products of Belleek. I know of two pieces in our museum which are artistic and worthy of a place in any exhibition as examples of ceramic art. I trust we may see some more in 1895.

Printing comes next. Artistic printing, in the true sense of the word, is not produced in Dublin. Perhaps one might often call what takes its place fantastical printing. The printing done in Dublin during the last century by Grierson was excellent. Good plain printing can be done in Dublin, and is done. A defect of Dublin printing, however, is that the types are of a very thin nature, and therefore will not take the ink properly. Very often the ink might be better. Like everything else, if you give a little time and attention to the matter, you can get good work. Choose a good bold type, and see that the spacing is properly arranged. A good paper is a great help to good

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printing. We shall have a good exhibit of printing, but it will not be modern artistic work.

Repoussé Work.—This is entirely in the hands of amateurs. There is a school of metal work in co. Tyrone.

Seal-Cutting.—One is surprised to find that this craft is excellently represented in Dublin. I know myself of one good seal-cutter, and have no doubt our exhibition will produce more.

Wall-Paper Designs.—Here we have an opportunity for any young designer to make himself or herself known. In fact this is one of the objects of the forthcoming exhibition. I can assure anyone exhibiting good and original designs that it will not be long before some large firm seek the designer out and secure his services. Good designers are scarce. It may be an encouragement to say that one of the best, if not the best designer in the United Kingdom, is an Irishman, and head of the City and Guilds School, London.

Wood-Carving.—In this craft there are several schools in Ireland. I have not seen much of the work, but what I have seen shows a tendency to over-elaboration. There is one distinct feature of Irish wood-carving—it is bold and rough; perhaps a little too rough. In this, also, good design is wanting; if a good design is secured let the carver carry it out and not try to improve on it. Several Irish ladies foster and take the greatest interest in schools of wood-carving. Irish boys are apt pupils and take most kindly to this craft.

I hope those who read this article will not think I have been too severe on some of our crafts. I write to draw attention to the fact that good work can be done in Ireland. A beginning has, at any rate, been made; fresh ground has been broken, and we have here a work in which all parties in our party-loving country can join and help one another. Arts and crafts may be the means of leading us to a peaceful and friendly understanding of one another.

At the meeting of the Mersey Docks Board a scheme was submitted for the construction at the Pierhead of a railway station in connection with the North-Western line, as well as for lengthening the Prince's landing-stage and for additional dredging. The improvements, estimated to cost 36,800*l.*, have been suggested with the object of facilitating the Atlantic passenger traffic.

A YEAR'S BUILDING IN BIRMINGHAM.

MR. F. W. LLOYD, building surveyor, has forwarded us his annual report of new buildings, &c., for which plans were approved during the year 1894, along with a comparative statement of the three previous years. The total last year was 2,540; in 1893, 2,294; in 1892, 2,151; and in 1891, 1,541. These figures are made up as follows:—

	Houses and Shops.	Business Premises.	Warehouse and Shopping.	Miscellaneous.	Alterations and Additions.	Churches.	Chapels.	Schools.
1894	1,790	30	117	353	242	1	4	3
1893	1,058	26	149	291	163	2	3	3
1892	1,491	22	199	230	203	1	2	3
1891	966	36	183	214	139	0	0	3

As will be seen by the foregoing table one church has been erected, viz. St. Patrick's R.C., which is situate at Dudley Road and is in lieu of the temporary iron mission chapel. The following are the chapels:—Baptist, Arthur Road, Salliey; Working Men's, Lodge Road; Gospel Mission Hall, Ladypool Road; Christian Meeting Room, Mary Street, Balsall Heath. Amongst the miscellaneous buildings are included a temporary iron mission room, Camden Street, and another in Musgrave Road (Church of England). Other miscellaneous buildings are the City Meat Market, Bradford Street and Cheapside; extension of Church of England Girls' Friendly Society's premises, Barwick Street; extension of Eye Hospital, Edmund Street; Heath Green Road Sunday School; extension of Villiers Street School and mission room, and extension of Washwood Heath Church; additions to St. George's Mission Room, Smith Street; New Mission Room, Farm Street; and Mission Room, Norton Street, Balsall Heath. The new schools are:—Baptist, Arthur Road, Salliey; Board Schools, City Road; and Baptist Schools, Harborne. Additions to schools are:—Lavatories, Dixon Road Board Schools; classrooms, Foundry Road Board Schools, St. James's Schools, Parish Schools, Ampton Road; classrooms, Board School, Montgomery Street; Oratory Schools, Edgbaston; St. Chad's Cathedral School, Shadwell Street and Loveday Street; St. Peter's R.C. Schools, Broad Street, Wesleyan Schools, St. Martin's Street. Notices have been forwarded to property

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owners and others in reference to dangerous buildings, &c., to the number of 740, and 247 factories have been visited re exits, &c., under the Factory and Workshops Act 1891, 223 of which have been dealt with in accordance with the requirements of the Act. Forty-five square yards of ground have been given up by property owners and others setting back projections, &c.

THE BY-LAWS IN WIMBLEDON.

In a letter to the *Times* Mr. T. G. Jackson, A.R.A., writes:—

Among other duties, the new district councils will inherit from their predecessors the administration of the Building Act. I venture to suggest that advantage be taken of this new departure to make a general inquiry into the rules by which their procedure will be governed, to revise them where needful, and, further, to provide some machinery for securing that the by-laws shall be fairly and justly enforced.

For instance, in this town there is a by-law prescribing a certain amount of open space behind every new building. Notwithstanding this, a local builder has intruded a large building into a confined backyard to the danger and annoyance of his neighbours, and in defiance of the conditions of open space.

Remonstrance with him only produced a threat to raise the offending building a storey higher.

A remonstrance addressed to the Local Board elicited at the end of a month the astounding declaration that, as the new building adjoined an old one, it was not a new building at all, and therefore was exempt from the by-laws.

It appears, therefore, that anybody in Wimbledon possessing an old cottage may add a mansion to it without any interference on the part of the local authority. I am informed by its officials that they could not prevent him from building his addition of wood and covering it with thatch in the midst of a thickly-crowded neighbourhood, nor make him build the walls of sufficient thickness for strength, or frame the floors and roofs of timbers stout enough for safety. Nor is there anything to prevent him from covering his site with building, leaving no air-space for himself and too little for his neighbours.

I venture to think the Local Board and its officers have wrongly understood their duties. The Metropolitan Building Act lays down the rule that every addition to an old building shall be treated as a new one, and there is nothing in the Wimbledon by-laws to justify this exemption. But the point

to which I wish to draw public attention through your columns is that if the Board is wrong, as I believe, there exists no machinery for making it do right. An appeal to the Local Government Board, which was delivered by hand at their office a month ago, has not yet been honoured by the usual official acknowledgment.

In this defect of any ready method of appeal I venture to think there is something that needs remedy. The parish councils may be an admirable device theoretically for the protection of the inhabitants; but one cannot help asking *Quis custodiet ipsos custodes?*

The reply of the Clerk to the Local Board is as follows:—

The Local Board of Wimbledon, which is about to become a district council, has, by virtue of the Public Health Acts and of by-laws made under those Acts and sanctioned by the Local Government Board, a certain control over "new buildings," and Mr. Jackson is astounded to hear that this control does not extend to additions to old buildings.

Mr. Jackson, as I understand, contends that an addition to an old building is, in fact, a new building. But any one connected with local government law knows very well that this is not so. The leading authority on the subject, if authority be needed, is "Shiel v. the Mayor of Sunderland," decided more than thirty years ago by Lord Chief Baron Pollock and Barons Martin and Bramwell, which shows that very extensive work may be done by way of addition to old buildings without any control by the local authority. Since then other cases of the kind have come before the Courts, the question usually being whether the work in dispute was a new building or an addition to an old building, and this is held to be a question not of law, but of fact, to be decided upon a consideration of all the circumstances of the case. Nobody, so far as I know (except Mr. Jackson), has ventured to contend that an addition to an old building is a new building. His reference to the Metropolitan Building Act is against his own view rather than in favour of it, since it shows that where the Legislature intends to give control over additions it gives it in express terms.

Mr. Jackson's suggestion that if additions are not subject to the by-laws anybody possessing an old cottage may add a mansion to it without interference by the local authority is, I think, fallacious, because the Court would probably hold that the mansion was not an addition in the proper sense of the word.

I need not discuss the question whether it is desirable that urban authorities should have control over additions to old

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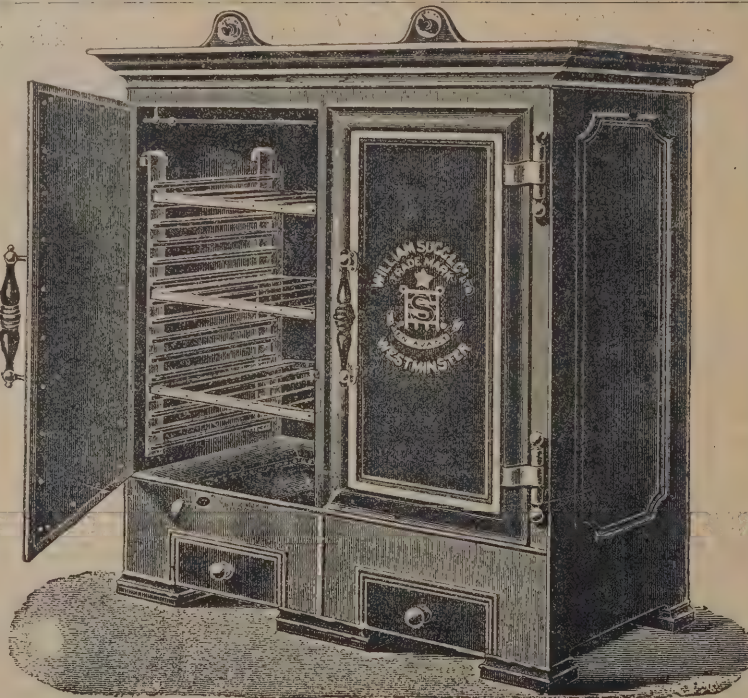
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buildings. Personally, I should agree with Mr. Jackson that it is; but my only object in troubling you is to show that in the present state of the law urban authorities have no such control, and that the officials of the Wimbledon Local Board do not (as Mr. Jackson suggests they do) wrongly understand their duties in the matter.

Mr. Jackson, in reply, says:—The letter of the clerk to the Wimbledon Local Board reaffirms the statement that any owner of an old building at Wimbledon may make additions to it of insecure construction, combustible materials, such as wood or thatch, with insufficient air space indoors, and none at all of its own out of doors if he pleases to cover the whole of his site. Contiguous owners whose light and air and safety are compromised need not look to the Board for protection, as he says that body has no power of interfering.

I find it difficult to reconcile this with the fact that the building to which I referred in my former letter was submitted to the approval of the Board in the way usual with new buildings. The plans were deposited and passed, subject to certain alterations in thickness of walls, and copies of them were retained and filed by the surveyor. The building has, in fact, been treated as a new one, and has passed the ordeal of the Board, although it violates the by-laws with regard to the retention of open space.

There is another opening, according to the showing of the clerk to the Wimbledon Board, in which the Board can intervene. He says my suggestion that anybody possessing an old cottage can add a mansion to it without obeying the by-laws is fallacious, because that would not be regarded as an addition in the proper sense of the word. By what rule, then, does the Board decide when an addition ceases to be an addition and becomes a new building? Is it an addition so long as it remains less than the old building, and, if so, how much less? May it be as large? May it be larger, and, if so, how much larger? Here is obviously room for great latitude of interpretation, which ought not to be left to a body such as local boards are, and with practically no appeal from their judgment. For most men will submit to a substantial injustice rather than attempt to right themselves in a court of law.

Practically it seems to me that different local boards enforce their by-laws pretty much according to their different ideas of interpretation. Since my letter appeared in print a correspondent tells me of one rural board, at all events, which treats all additions as new buildings, just as they are treated under the Metropolitan Building Act. It is not to be desired

that the by-laws should be identical in all places; that would be a misfortune; but it is surely time that all places should be agreed as to the cases in which the local by-laws shall be enforced. The case would be met if Section 209 of the Metropolitan Building Act were extended to all places where the Public Health Acts are in operation.

There ought also, I repeat, to be some easy and inexpensive mode of appeal to which those who think their local board has decided wrongly might resort.

BUILDING IN EDINBURGH.

THE year just closed has been an active one in the building trade of Edinburgh. Taking the returns of the Dean of Guild Court, we find, says the *Glasgow Herald*, that during the twelve months ended in September the number of warrants granted was 633, a figure far in excess of any in recent years. It is true that 186 of these were for minor alterations and improvements, but even these count for something when, as was the case, the demand for larger classes of work was considerably over the average. According to Dean of Guild Miller, the warrants for house property granted authorised the construction of 72 first-class houses and villa residences and 753 tenement dwellings. Of this latter number, 224 were two-roomed houses, 284 houses of three rooms, and the remainder dwellings of four rooms and upwards. There is reason for belief, too, that notwithstanding this activity in providing for the housing of a rapidly-growing population, public requirements have not yet been fully met. According to Mr. Dowell's annual report on the state of the Edinburgh property market, the proportion of unlet property to the city rental, 2.45 per cent, is the lowest on record. Builders may, therefore, be expected to do as well in the incoming year as in the past, so far at least as dwelling accommodation is concerned. Many important works, however, on a more ambitious scale, have either been completed during the year or are rapidly nearing completion. One of these is the hall adjoining the new university buildings, which is at once an ornament to the city and a magnificent monument to the wisdom and liberality of Mr. M'Ewan, M.P. Thanks to the City Improvement Scheme, the old tenements which confronted the new hall and entirely hid from view the respectable edifice of the Students' Union have been removed, and a visitor to the city can now view both buildings without the necessity for odious comparisons being forced upon him. The open space

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created by the scheme has not yet been utilised, but the propriety of placing on it a statue of one or other of the city's benefactors has been suggested. Another building which only needs internal fittings to complete it is the National Observatory on Blackford Hill. Standing on the ridge of the hill's eastern slope, the observatory is a prominent feature in the landscape, while for the astronomer's purpose its situation contrasts most favourably with that occupied so long on the Calton Hill. Other buildings that have also left the contractors' hands are the New Craig House Asylum for the Insane—a large edifice in the French Renaissance style which stands at the western extremity of the city—and the Morningside Free Church, a handsome building which has been built almost opposite its smaller predecessor, to meet the wants of the Free Church community in one of the most rapidly increasing portions of the city. In Princes Street the new structure which Messrs. Jenner have reared on the ruins of the old buildings destroyed by the great fire two years ago will not long remain unfinished. A few yards away Messrs. Cranston & Elliot, who have surrendered their present premises to the necessities of the North British Railway Company, are reconstructing the Edinburgh Hotel, and it may be hoped that, like Messrs. Jenner, they will add another notable feature to the amenity of the "finest street in Europe." The Roman Catholic community have begun a fine Gothic church in Slateford Road, and it will not be long before the reconstruction and extension of the pro-Cathedral in Broughton Street will be undertaken. The School Board promises to have one or two important works on hand during the present year; but one which is now in the builders' hands, and has already reached an advanced stage, is the school at Montpelier, one of the largest, and in its equipments perhaps the finest, for which the ratepayers have had to find the money. Another school for the St. Cuthbert and Dean Board has been erected in the Murrayfield and Coltbridge district. Of a different class is the work which has been going on for some time at the Haymarket Station, while the North British Railway Company are also providing for the convenience of travellers by erecting a new station at Broughton Road. The reconstruction of the North Bridge and the proposed re-erection of the Waverley Bridge are not undertakings which can greatly benefit builders, but they will at any rate provide some work for masons and members of one or two of the allied trades. House extension has taken place in the south, west, and north-west districts of the city. Little has been done in the Newington suburb, but, as in previous years, a good deal of feuing has

gone on in Morningside. The easy access which golfers have to the Braid Hills courses makes this suburb one of the most popular in the city to those who can command a fair amount of leisure. In Bruntsfield, Merchiston and Dalry villas and tenements have also been run up, and in these districts, as in Morningside, the feuing spaces within the municipal boundary are being rapidly overtaken.

As indicated already, there has been plenty of employment in the building trades during the year, and in every branch, with the single exception of the bricklayers, an advance has been conceded and maintained.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C. from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

25021. Samuel Naylor, for "Improvements in water-heating and circulating apparatus for domestic fireplaces."
 25065. Carl Wicke, for "Improvements in roofing tiles or slabs."
 25118. Lewis Cass Miller, for "Improvements in sash fasteners."
 25167. Lambert Mulkay and Joseph Mulkay, for "Improvements in and relating to flushing apparatus."
 25253. William Fowler, for "A new sash-cord fastener."
 25269. Otto Ferdinand Jonath, for "Improvements in the construction of ceilings."
 25282. Josiah Weldon, for "Improved device for retaining window-sashes in any position."
 25291. Hugo John, for "Improvements in and connected with chimney-cowls."
 25229. Thomas Sumner, for "Improvements in window-blind fittings."
 25364. Edwin Oliver Read, for "Improvements in window-catches."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. KAYNER & CO., Patent Agents, 37 Chancery Lane, London, W.C.



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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

TENDERS, ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

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DURHAM.—March 25.—Competitive Schemes are Invited for the Sewage Disposal of the District. Premiums 100l. and 50l. for Two Best Schemes. Mr. F. Marshall, Town Clerk, Durham.

IPSWICH.—March 25.—Designs are Invited for the Building of a Workhouse and Infirmary, with Specifications and Estimate. Premiums 100l. and 50l. Mr. A. F. Vulliamy, Clerk to the Guardians.

LEEK.—March 4.—Designs are Invited for Proposed Covered Markets. Premiums 50l., 25l. and 10l. offered. Right reserved to carry out the Work by the Board's Architect. Mr. C. Henshaw, Clerk to the Improvement Commissioners, Leek.

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ABER.—For Building Four Shops and Houses. Mr. Charles Taylor, Architect, 22 Duke Street, Cardiff.

BAGSTONE.—Jan. 21.—For Building Small Board School. Mr. W. L. Bernard, Architect, 3 St. Stephen's Chambers, Baldwin Street, Bristol.

BANGOR.—Feb. 2.—For Building Baptist Chapel at Glanadda. Mr. R. Glynne Davies, Architect, 220 High Street, Bangor.

BARNSELY.—Jan. 23.—For Building Four Houses and Shops. Messrs. Wade & Turner, Architects, 10 Pitt Street, Barnsley.

BARNSELY.—Jan. 19.—For Additions to Imperial Cabinet Works. Messrs. Wade & Turner, Architects.

BARNSTAPLE.—Jan. 24.—For Additions to Wesleyan Day Schools. Rev S. Cox, Hills View, Barnstaple.

BEAUMARIS.—Jan. 29.—For Additions to County School Premises. Mr. Evan Thomas, Borough Surveyor, Beaumaris.

BELFAST.—Jan. 25.—For Stabling at Musgrave Street Constabulary Barracks. Mr. P. J. Tuohy, Secretary, Office of Public Works, Dublin.

BLACKPOOL.—Jan. 23.—For Extension of Railway Goods Warehouse, Talbot Road. The Engineer, Hunt's Bank, Manchester.

BLAENAVON.—Jan. 18.—For Additions to Premises. Mr. E. A. Lansdowne, Architect, Commercial Street, Newport, Mon.

BRADFORD.—Jan. 23.—For Office-fittings for Premises of Industrial Society. Messrs. Rycroft & Firth, Architects, Bank Buildings, Manchester Road, Bradford.

CARDIFF.—Jan. 22.—For Construction of Bridge under Railway. Mr. G. K. Mills, Secretary, Paddington Station, W.

CARDIFF.—Jan. 23.—For Improvement of County Bridges. The County Surveyor, Town Hall, Bridgend.

CARDIFF.—For Schoolroom for Congregational Chapel. Mr. Edwin Seward, Architect, Queen's Chambers, Cardiff.

CHESTER-LE-STREET.—Jan. 19.—For Building Court-house and Additions to Police Station. Mr. W. Crozier, County Architect, Shire Hall, Durham.

CITY OF LONDON.—Jan. 25.—For Construction of Sewer Subway, &c., in Sandy's Row. Engineer, Sewers Offices, Guildhall.

CLONES.—Feb. 4.—For Carrying-out Waterworks. Mr. J. H. H. Swiney, Engineer, Avenue Chambers, Belfast.

COLNBROOK.—Jan. 21.—For Additions to School Buildings. Mr. Collier, Boys' School, Colnbrook, Bucks.

CROYDON.—Jan. 28.—For Erection of Boundary Walls at the Infirmary in Mayday Road. Mr. Frederick West, 23 Coombe Road, Croydon.

DEPTFORD.—Jan. 23.—For Paving Footways of Barnes Terrace with Tooled York Stone and Guernsey Granite Kerb, Paving Channels with Guernsey Granite Cubes and Making-up Roadway with Broken Guernsey Granite. Mr. J. Spencer, Clerk of Board of Works, Greenwich.

DINAS POWIS.—For Building Detached Villa. Mr. W. H. Dashwood Caple, Architect, 1 St. John's Square, Cardiff.

DUNGARVAN.—Jan. 31.—For Works of Building, &c., at Bathing Place. Mr. Thomas McCarthy, Town Clerk.

ENFIELD LOCK.—Jan. 23.—For Sinking Well, Erection of Tank House, Cast-iron Tank and Boundary Wall at Public Baths. Mr. W. Ketteringham, Engineer, Court House, Enfield.

FARNHAM.—Jan. 28.—For Erection of Board Schools and Teachers' Residences. Mr. J. Alfred Eggar, Architect, Farnham.

GOLCAR.—Jan. 21.—For Additions to Board School and Building Infants' School. Mr. J. Barry, Architect, 9 Queen Street, Huddersfield.

GREAT NORTHERN RAILWAY.—Jan. 24.—For Extensions of the Leen Valley Railway. Mr. Richard Johnson, C.E., Company's Engineer, King's Cross.

HALIFAX.—Jan. 24.—For Building Sunday School and Parochial Room. Messrs. Horsfall & Williams, Architects, 15 George Street, Halifax.

HALIFAX.—Jan. 19.—For Building Twelve Houses. Mr. Medley Hall, Architect, 29 Northgate, Halifax.

HASTINGS.—Jan. 29.—For Laying Sewers. Mr. A. R. Inskip, 11 Wellington Square, Hastings.

HAVANT.—Jan. 30.—For Building Classroom and Offices at Board School, Bedhampton. Mr. G. C. Vernon Inkpen, Architect, 6 King's Road, Southsea.

HOMERTON.—Jan. 23.—For Erection of a Postmen's Sorting Office. Mr. H. W. Primrose, H.M. Office of Works, Whitehall Place, S.W.

HUDDERSFIELD.—Jan. 31.—For Additions to Meltham Hall. Messrs. John Kirk & Sons, Architects, Huddersfield.

ISLINGTON.—Jan. 28.—For Paving with Wood Blocks the Carriage-way in Highbury Grove. Mr. J. Patten Barber, Vestry Hall, Upper Street, N.

KEGWORTH.—Jan. 19.—For Construction of Covered Reservoir of Capacity of 50,000 Gallons, and Providing and Laying 6 Miles of 4-inch and 3-inch Cast-iron Pipes, with Sluice Valves, Fire Hydrants, &c. Mr. George Hodson, Engineer, Bank Chambers, Loughborough.

LEEDS.—Jan. 18.—For Alterations, Queen's Flour Mills. Mr. Albert E. Dixon, Architect, 8A Park Lane, Leeds.

LLANGATTOCK.—Feb. 4.—For Additions to Beaufort Hill Schools. Mr. W. S. Williams, Tredegar.

LONGFORD.—Feb. 5.—For Building Methodist Church. Rev. G. W. Rea, Rose Lawn, Longford, Ireland.

MAIDENHEAD.—Jan. 21.—For the Supply of Pink Terracotta Required in the Erection of a Building. Mr. E. J. Shrewsbury, A.R.I.B.A., Queen Street Chambers, Maidenhead.

MILDENHALL.—Jan. 19.—For Brick and Iron Girder Bridge. Mr. F. Whitmore, Architect, Chelmsford.

MOZERAH.—Jan. 28.—For Additions to Chapel House. Mr. Morgan Wm. David, Bryn, Rhydderch, Abergavenny.

NEEPSSEND.—Jan. 26.—For Removing and Raising Roof and Building Additional Storey with Oxide Floor at the Sheffield Gas Company's Works. Mr. Fletcher W. Stevenson, Engineer.

NEWBRIDGE.—Jan. 28.—For Building Public Hall of Corrugated Iron. Mr. Wm. Price, Beehive Stores, Newbridge, Mon.

NEWBRIDGE.—Jan. 28.—For Building Mixed School. Mrs. George Rosser, Architect, Victoria Buildings, Abercarn.

NORTH-EASTERN RAILWAY.—Feb. 6.—For Erection of Passenger Stations, Goods Warehouse, Weigh Office, Stable, &c. Mr. Wm. Bell, Architect, Central Station, Newcastle-on-Tyne.

OLDHAM.—Jan. 22.—For New Bridge over Railway. The Engineer, Hunt's Bank, Manchester.

OXFORD.—Jan. 22.—For Footbridge over Railway. Mr. G. K. Mills, Secretary, Paddington Station, W.

PAIGNTON.—Jan. 31.—For Construction of Storage Reservoir, Two Filters and Works Connected, for the Local Board. Messrs. John Newton & Son, Engineers, 17 Cooper Street, Manchester.

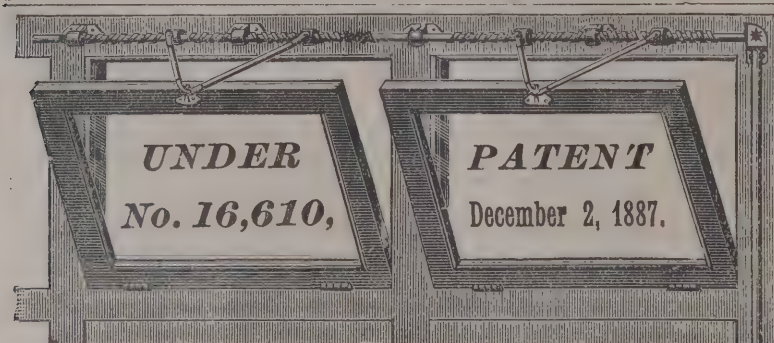
PONTYPRIDD.—Jan. 30.—For Construction of Tramroad 1 Mile 30 Chains in Length, Laying a 15-inch Cast-iron Conduit Main (1 Mile 55 Chains in Length), Construction of a Reservoir, Seven Filter-beds and Service Tank in Valley of Rhondda Fach River. Mr. Togarmah Rees, C.E., Corn Exchange Chambers, Newport, Mon.

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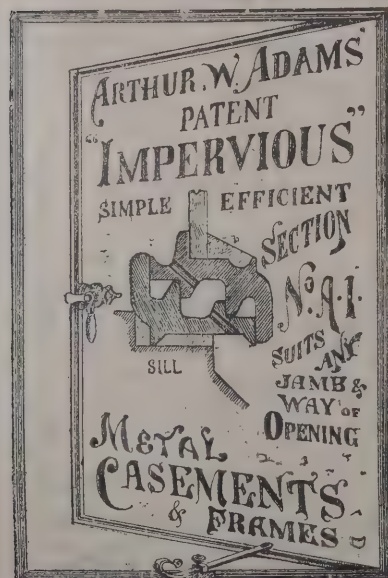
RAINHILL.—Jan. 24.—For Additions, &c., to Infirmary Wards, Lancashire County Lunatic Asylum. Mr. R. C. Lewis, Clerk.

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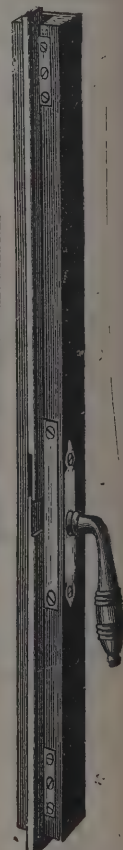
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STAMFORD.—Jan. 18.—For Building Post Office. The Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

SWANSEA.—Jan. 18.—For Building Day Room at Training College. Mr. H. C. Portsmouth, Architect, Fisher Street, Swansea.

TORQUAY.—Jan. 19.—For Building Church at Cockington. Mr. C. A. Nicholson, Architect, 11 Beaumont Street, W.

TROWBRIDGE.—Jan. 31.—For Erection of Buildings for the North Wilts Dairy Company. Mr. W. H. Stanley, Architect, Town Hall Chambers, Trowbridge.

WALTHAMSTOW.—Jan. 22.—For the Erection of Board Schools in Coppermill Road. Mr. W. A. Longmore, A.R.I.B.A., 7 Great Alie Street, Whitechapel.

WATFORD.—Jan. 25.—For Building Police Barracks, &c. Mr. Urban A. Smith, County Surveyor, 41 Parliament Street, S.W.

WHITEHAVEN.—Jan. 19.—For Building Sunday School, &c. Messrs. Moffat & Bentley, Architects, Whitehaven.

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Wells & Son, Thame	559	18	0
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J. Smith, Belfast	8,143	0	0
T. C. Raynor, Bangor	7,902	17	9
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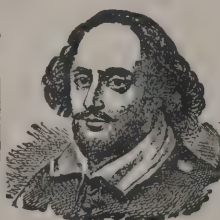
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J. H. Cooke, Southsea	2,370	0	0	33	0	0
A. Tennant, Farnborough	2,878	0	0	28	0	0
G. Kemp, Aldershot	2,717	0	0	31	0	0
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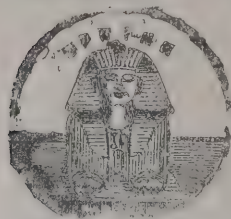
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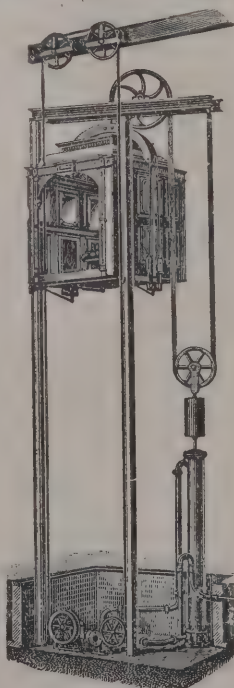
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F. Ashley, Cardiff	2,436	18	7
J. E. Rich, Cardiff	2,329	15	8
J. Brock, Cadoxton	2,278	2	6
J. Rees, Ely, Cardiff	2,168	1	0
E. Williams, Whitchurch	2,116	4	0
Barnes, Chaplin & Co., Rhondda	2,100	4	9
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Wilkinson Bros.	1,495	0	0
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G. Wimpey & Co., The Grove, Hammersmith	412	5	2
M. L. Ketteringham, Enfield	363	18	8
J. Jackson & Sons, Enfield	350	1	0
J. C. Trueman, Swanley	342	11	5
H. Lee, Southall	335	9	0
Fry Bros., Greenwich	335	4	7
F. Dupont, Southend	319	15	11
T. Adams, Wood Green	300	18	5
E. Iles, Mitcham	294	14	8
W. BUXTON, Prittlewell (accepted)	257	11	2

Back of Park Road and Park Street.

Kent Road Maintenance and Stone Supply Co.	308	19	2
Fry Bros.	304	17	6
G. Wimpey & Co.	297	8	2
J. Broderick & Co.	284	2	6
W. Buxton	275	5	10
J. Jackson & Sons	255	5	9
M. L. Ketteringham	247	8	9
F. Dupont	238	17	5
J. C. Trueman	236	19	9
H. Lee	235	2	10
T. Adams	231	10	0
E. ILES (accepted)	190	15	10

Gordon Road.

Kent Road Maintenance and Stone Supply Co.	493	4	2
G. Wimpey & Co.	469	14	8
J. Broderick & Co.	413	5	0
J. Jackson & Sons	371	16	5
H. Lee	357	6	6
M. L. Ketteringham	355	17	3
Fry Bros.	353	2	4
J. C. Trueman	349	13	2
F. Dupont	344	12	8
T. Adams	326	4	8
W. Buxton	302	16	8
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J. Broderick & Co.	386	11	0
M. L. Ketteringham	379	13	0
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Fisher & Le Fann, Collooney.	£28,723	13	0
J. Cunningham, Dublin	25,766	3	8
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E. Manisty, Dundalk	23,940	9	0
G. LAWSON, Ruthlergen (accepted)	22,500	0	0
Workman & Co., Belfast	19,215	0	0
R. W. Johnson, Cork	17,647	0	0
Engineer's estimate	22,576	0	0

AMERICAN NOTES.

THE *Southern Lumberman* gives the following solution of fire from steam pipes:—Neither ordinary live steam nor "superheated" steam will heat a pipe thick and strong enough to convey it to a degree sufficient to produce a fire on wood, however dry. It will not even set charcoal aglow or in a blaze. But dry charcoal, when the heat is removed from it, being nearly pure carbon, will absorb oxygen from the air under favourable conditions so rapidly as to produce active combustion, that is, a glow or a blaze. The process of the origin of a fire from a steam pipe is:—The heat from a steam pipe will in the course of time char or, as the chemists say, carbonise wood in contact or close to it. When this charring process extends to any depth in the wood it presents a surface full of fissures and cracks, thus exposing a large section to the action of the air. This process of charring drives the oxygen out of the charred portion and keeps it out while the heat is kept up. When the heat is removed the charcoal reabsorbs oxygen from the air, and if this action is rapid enough in a dry atmosphere combustion is the result. This explains why fires in steam plants and buildings heated by steam that originate from steam pipes always occur after the pipes have cooled, generally during the night.

A SERIES of tests have, the *Railway World*, Philadelphia, says, been recently made on the Philadelphia, Newtown and New York Railway, a division of the Philadelphia and Reading Railroad, about eight miles of which are equipped with the block system of the Audible Electrical Block Signal Company, of Philadelphia. This system enables the engineer, by the ringing of the bell in the cab of the engine, to know when entering a block that the block is or is not clear of obstruction. The system is arranged by equipping the road in the following manner:—Two plates of iron, about 6 inches wide and 30 feet long, are fastened to the ties between the rails a sufficient distance apart to avoid contact with the water-scoop of the locomotive. In a double-track road there would be four of these plates, two to each track. Two of these plates are placed at the end and two at the beginning of each block, with about 100 yards between the blocks. They are connected with a wire, which is buried about 4 feet below ground to remove it from damage by section bands in placing or tamping ties. This wire reaches to the nearest telegraph pole, and is connected to the line wire by a similar plate at the end of the block, and from that block connects

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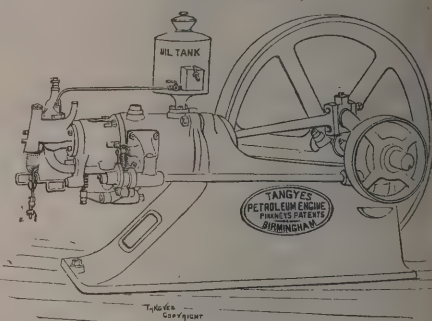
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with the rail of the section ahead, each section being insulated by wooden fishplate and insulation. The engine is equipped, just behind and underneath the cow-catcher, with two copper brushes, so arranged as to come in contact with the plates in passing over them. These brushes are connected by insulated wires to two batteries on each side and underneath the cab, and these batteries are connected to the gong inside of the cab. The battery underneath the engineer's side of the cab is the active battery. The one under the fireman's side of the cab is the reserve battery, used only, in case of neglect, if the active battery should be exhausted. These batteries are the only electric force used in the system, and are in use only when an alarm is given. The engineer, on hearing the signal, knows that the block ahead of him is obstructed, and remains there until the bell ceases ringing, showing that the block is clear, or proceeds with caution, as may be decided by orders given by the superintendent of the road. Any metallic connection between the rails of a block so equipped, such as would be given by the two wheels and axle of a car on the block, a wire stretched across the two rails, or any other metallic connection, in case of emergency, will give a signal of danger to an approaching train by ringing the gong in the cab. Precautions are also taken against the opening of switches or the overhanging of a train in entering or leaving a siding. The system of signalling only becomes dumb by the absolute severance or parting of the line wire between blocks, and this is guarded against by a ground wire, which is placed between the iron plates on leaving and entering a block. The merits of tests of visible and audible danger signals in the block system are receiving a good deal of attention from the operating departments of our railroads, and if an audible signal is a desirable one, the company controlling this system seem to have reached great perfection and simplicity in their method. While visible signals cannot be seen during fog, snowstorms, or other unfavourable weather, the audible signal can be relied on, irrespective of atmospheric conditions. It is well adapted to tunnels, curves and cuts.

A RATHER interesting view on the consumption of timber by railways is that of the *Lumber Trade Journal*, which says:—"To one who is familiar with the tracts of timber tributary to the railroad, it is surprising how fast they are being cut back. Where but a short time since the line of forest closely crowded the iron track, it has now vanished with a celerity that to one not on the ground seems somewhat akin to magic. This is making it necessary to build logging roads farther back into

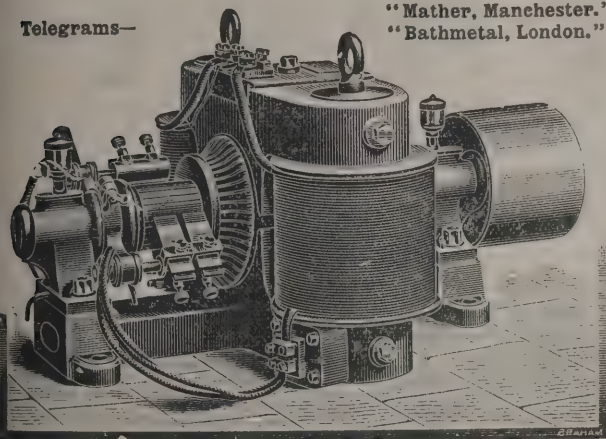
the country, until, in some instances, these unpretending spurs begin to assume the dignity of railroads, in so far as mileage is concerned, at least. This ceaseless slaughter of timber is not caused by prospective gain or a desire for the accumulation of wealth. In many cases it is the effort of necessity. Those who are inclined to blame millmen—and they are many—for this apparently ruthless slaughter of standing timber are in the wrong. The man who prefers to cut down his trees to going into liquidation and perhaps bankruptcy is not to be blamed."

INSTITUTION OF ELECTRICAL ENGINEERS.

THE ordinary general meeting of this body took place, under the presidency of Mr. Alex. Siemens, at the Institution of Civil Engineers, Great George Street, Westminster. Following the presentation of awards to Mr. Wilkinson for his paper on "Electric Tramways in the United States and Canada," to Mr. Allingham (student) for a paper on "Electric Batteries," Mr. Hoadley obtaining the Salomans scholarship, a vote of thanks to Mr. Siemens, the retiring president, was accorded on the motion of Professor Ayrton, seconded by Sir David Salomans. Mr. R. E. Compton, the newly elected president, then took the chair, and delivered an inaugural address, speaking mainly from a mechanical engineering point of view. He expressed his belief that the great development of modern electrical engineering dated from the time when the mechanical engineer first took in hand the design and construction of dynamo-electric machinery. Still, much was due to the impulse given to the progress of electrical engineering by the invention of the incandescent lamp by Swan, Stern and others. In the course of his address the president said that quite recently the attention, not only of electrical engineers, but also of the general public, had been directed by several accidents to the dangers attached to electrical conductors laid in the streets. In many cases these dangers were not properly attributed to the electric conductors themselves, but to the presence of gas in the soil through which those conductors passed. Wherever any space existed into which this gas could infiltrate; an explosive mixture might be formed which might be fired either by an electric spark from the conductors themselves, or by contact with a match dropped by a smoker. He, however, did not think that there was any reason for the public to unnecessarily alarm itself. In the vast majority of cases, where the system of conductors was continuously inspected for traces of gas, no accidents of any kind had occurred.

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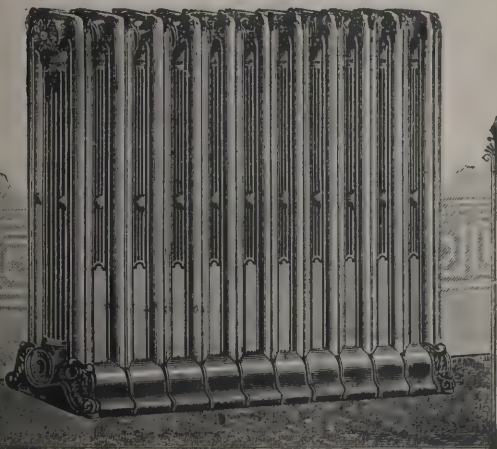
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VARIETIES.

At the meeting of the Glasgow Philosophical Society Professor A. H. Sexton, Glasgow and West of Scotland Technical College, read a paper on "Aluminium." Aluminium, he said, might be regarded as a very valuable addition to our meagre list of useful metals, and one of which increasing use would be made as time goes on; aluminium would certainly not supersede iron and steel for constructive purposes on a large scale. It would, however, be largely used for lighter articles where strength was not so important, and where lightness or resistance to corrosion would be valuable. It was likely to be very largely used for domestic purposes. It was enormously cheaper than silver, little, if any, dearer than nickel or German silver, and therefore it was likely to be much used for ornamental purposes. There was no doubt that the use of the metal had a very promising future.

The Dumfries Council has decided to consult an engineer to be named by Sir William Arrol regarding the condition of the Suspension Bridge, which was severely shaken by the recent storm.

At Macclesfield a Local Government Board inquiry has been held regarding the proposal of the Macclesfield Corporation to borrow 60,000*l.* for the purpose of a main drainage scheme.

The death has taken place of Mr. William Vawdrey, C.E., engineer to the South Staffordshire Waterworks Company, at his residence, 18 Chad Road, Edgbaston. The deceased was the second son of the late Rev. A. A. Vawdrey, many years vicar of St. Agnes, Cornwall, and he served his apprenticeship in practical engineering with the firm of Harvey & Co., of Hayle, Cornwall. After leaving Hayle Mr. Vawdrey was for two years in the Royal Navy, which he quitted on obtaining the appointment of engineer to the South Staffordshire Waterworks Company, a post which he held up to the time of his decease, a period of thirty years.

The *Manchester Guardian* says a piece of a section of one of the giant trees of the mountains of Fresno County, California, has lately been sent to the Museum of Owens College by the South Kensington authorities. At the distance of 8 feet from the ground the trunk measured 62 feet in circumference, and at the ground the tape line showed 90 feet girth. The height was close to 300 feet, the branches commencing more than 200 feet from the earth. It was estimated that the trunk would yield 400,000 feet of lumber. The group of

sequoias from which the tree was cut, situated in the locality known as the Converse Basin, contains, it is calculated, sufficient timber to keep the local saw-mills running for fifty years at a daily output of 130,000 feet during the summer months. A section of the same tree, which was shown at the Chicago Exhibition, and has lately been removed to the New York Museum of Natural History, weighs over 30 tons. It is 4½ feet in thickness.

At the meeting of the Manchester Association of Students of the Institution of Civil Engineers, Mr. A. Ross, C.E., in the chair, Mr. R. H. Clayton read a paper on "Mortars and Cements as applied to Structures." It was a matter of regret, the author said, that no concise and thorough information existed as to the classification and locality of good limestones in this country. Methods of distinguishing the nature of limes by their behaviour under certain tests were described, and instances cited where mortar composed of unslacked lime had seriously injured works by forcing masses of masonry entirely off their beds. Specifications of limes, cements and aggregates for mortars were given, with the results of various tests referring to the same. The qualities of Portland cement were briefly discussed, and the paper concluded with some remarks on the danger arising from the presence of "free lime" in Portland cements.

The course of lectures at the Royal Botanic Gardens, Edinburgh, organised by Professor Bayley Balfour, Regius Professor of Botany, for young practical foresters and gardeners, have proved, according to the *Scotsman*, of a very successful character. They are now in their third session. The first of a series of lectures on the valuation of woodlands and the disposal of their produce, with its transport, conversion, qualities, and uses, has been given by Mr. Andrew Slater, Haystoun, Peebles, a well-known authority on the subject, and among other lectures arranged for this session are short courses on draining and fencing, on landscape gardening and on decorative gardening. The branch of the subject dealt with by Mr. Slater was the measurement of rough timber, the valuation of growing woods at different stages of their existence, and the disposal of wind-blown timber.

SERIOUS damage has been done at Lossiemouth. Through the force of the tide two breaches, from 30 to 40 yards wide, were made in the sea-wall lately built by the Great North Company, as also a smaller one. The south pier of the harbour has also been considerably damaged. The damage to the sea-wall, the harbour and the boats is estimated at 3,000*l.*

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THE Local Government Board have granted permission to the Ipswich Town Council to borrow 18,500*l.* for the purchase and laying out of Christchurch Park, which is beautifully situated in the heart of the town, as a public recreation ground.

At the meeting of the Port Glasgow Town Council a letter was submitted from Mr. Joseph Russell, shipbuilder, accompanied by a cheque for 600*l.* to put the baths and wash-houses in good working order. Mr. Russell originally gave 5,000*l.* to the Town Council for the purpose of erecting the public baths and wash-houses, but the total cost of erection and equipment has turned out to be 5,485*l.*

A CORRESPONDENT of the *Parish, District, and Town Councils Gazette* (which promises to be a useful addition to the municipal journals) points out that the object of section 46 of the Parish Councils Act "is to prevent a parish councillor from obtaining any personal pecuniary advantage by holding office, and as in certain cases, at any rate, that object might be defeated if councillors supplied goods to trustees appointed by the Council, tradesmen would be well advised if they either resigned their seats or declined the orders. A parish councillor should be above suspicion."

MR. HALDANE puts the prairie value of London at 16,000*l.* a year. The actual rent paid for the bare soil of London is, however, almost exactly 16,000,000*l.*—or a thousand times as much.

It is stated that Sir Algernon West has intimated to his neighbours at Wanborough, Guildford, that he intends to erect a Working Men's Institute in the village as a memorial to the late Lady West.

At Middlesbrough fifty-five applications have been received for the post of borough surveyor. The following six names have been selected for consideration:—Mr. T. D. Cooper, assistant borough surveyor, Middlesbrough; Mr. T. W. Stainthorpe, surveyor to the Eston Urban Council; Mr. Frank Baker, city surveyor, Canterbury; Mr. S. E. Burgess, borough surveyor, Stoke Newington; Mr. M. Scott, borough engineer, Thornaby; and Mr. J. E. Stafford, Blackburn.

At the conversazione of the Midland Institute, Birmingham, just held, among other exhibits was a portion of the collection drawings and plans of ancient British and Roman camps

recently presented to the Archæological Section by Miss Lines, of Worcester, in memory of her father, the late Mr. H. H. Lines, by whom the drawings were made. These drawings are of extreme antiquarian interest, and it is believed that there is no similar collection in existence.

At the meeting of the Glasgow University Court, Lord Provost Bell moved—"That in view of the erection of art gallery and museum buildings by the Association for the Promotion of Art and Music in the City of Glasgow, it be remitted to the museums committee to consider if it is advisable to arrange therein for accommodation of the Hunterian Museum or any portion of it." The motion was adopted.

At the meeting of the Coventry City Council, on the recommendation of the electric-light committee, it was decided to accept the tender of Messrs. Chamberlain & Hookham, Birmingham, for the supply of meters, each meter to be certified as efficient by the Electrical Standardising and Testing Institution, the specification for the meters having been prepared by Mr. R. Hammond, the consulting electrical engineer to the Corporation.

GREAT inconvenience has been caused to vehicular traffic in the neighbourhood of Preston by the partial collapse of both sides of one end of the bridge over the Ribble at Walton-le-Dale. In connection with some extensive sewerage works for that village, tunnelling has been carried on under the bridge. The recent frost and subsequent rapid thaw caused the bridge to subside, leaving only just room for a horse and trap or other light carriage to pass over in the middle of the roadway. Even that is in such a dangerous state that heavy traffic is prohibited. The bridge was built in 1779-81, and cost 4,000*l.*

At the meeting of the Paisley Police Commissioners, Provost Mackenzie stated that the arrangements in connection with the formal handing over of the baths in Storie Street as a gift to the community had now been completed, and he moved that they forward to Mr. Dunn, writer, agent for the donors, a vote of thanks recognising their kindness. In addition to the baths, Mr. James Coats and those associated with him, he might add, had also handed over a sum of 850*l.* Ex-Bailie Smith seconded the motion, which was supported by ex-Provost Clark, and unanimously adopted.

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TRADE NOTES.

THE patent folding partitions, of which Messrs. Peace & Norquoy are the sole makers, have been adopted by the Rochdale School Board in the new Spotland Schools, under the superintendence of Mr. T. Townsend, architect, Rochdale.

THE city authorities of Carlisle have placed a new illuminated turret clock, showing the time upon four external dials 5 feet 4 inches each in diameter, in the tower of the "Tullie House" Fine Art Gallery. The clock is made from the designs and plans of Lord Grimthorpe and has all the latest improvements inserted by Messrs. W. Potts & Sons, clock manufacturers, of 13 Guildford Street, Leeds, and 22 Collingwood Street, Newcastle-on-Tyne—makers of the Corporation Markets and North-Eastern Railway Company's illuminated clocks, Carlisle—from instructions received by them from the city surveyor, Mr. W. Howard-Smith, C.E.

THE Tilehurst Board Schools, Reading, are being warmed and ventilated by means of Shorland's patent Manchester grates and patent Manchester stoves, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

WE are informed that Mr. Swaine Bourne, of Birmingham and London, artist in stained glass, has taken into partnership his son, Mr. Kendrick Swaine Bourne, and the firm will be known as Swaine, Bourne & Son, henceforth. Mr. Kendrick Swaine Bourne is already known for his artistic abilities, and that is a guarantee for the continued success of the firm in producing art works of the highest excellence.

THE business and undertaking, including stock and plant, of Elliot's Patent Stove Company, Limited, were sold by auction at the company's premises, Rye Harbour, Sussex, as a going concern, for 4,000*l.*, by Mr. Wm. Thos. Smith, auctioneer and surveyor, Rye and Tenterden, on Tuesday, the 15th inst.

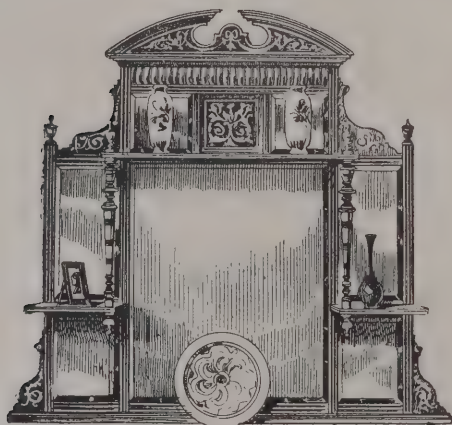
IN consequence of Messrs. J. & P. Coats, thread manufacturers, Paisley, having conveyed to the trustees of the Peter Brough Bequest Fund the site and buildings in George Street formerly occupied by them as dyeworks, together with the sum of 3,000*l.*, for the purposes of a technical school, it has been decided to hand over the whole property, funds and effects of the Paisley Government School of Art to the governing body of the Technical School.

THE Paisley Police Commissioners have resolved to proceed with the extension of the public baths. The estimated cost of the extension, according to the plans, is 4,500*l.*

WE find that Mr. W. C. Bryant, of Main Street, Birmingham, is exhibiting some splendid marble chimneypieces at the Yorkshire Trades Exhibition at Sheffield suitable for drawing-rooms, in statuary Pavenazzo and Languedoc, Rose Castille and Rose Vif; and dining-room chimneypieces in Griotte St. Remy, Rouge Royal, St. Annes, and Irish green. Mr. Bryant holds the largest stock of marble chimneypieces in the United Kingdom, and is the representative of the well-known firm of Devillers & Co., of Belgium, France and Italy, whose finish and quality of marble are superior to any other marble house in the world. Mr. Bryant gives special attention to architects' designs, and does a large business in marble work for public buildings, &c.; also in enamelled slatework of every description. We lately had the opportunity of seeing some of the chimneypieces in Birmingham.

TECHNICAL TRAINING.

THE annual meeting and distribution of prizes in connection with the Manchester Municipal Technical and Art Schools was held on Tuesday evening in the Town Hall, under the presidency of Mr. Alderman Hoy (chairman of the technical instruction committee of the City Council). The principal prizes awarded to students as the result of recent examinations were distributed by the Bishop of Manchester. Sir Henry Roscoe, M.P., in a letter excusing his attendance, stated:—"All friends of technical education must be gratified by the progress which has been made throughout the country, and we in Manchester may well be proud of the position which our school has won for itself—a position which I do not hesitate to say is a unique one in the country." Letters regretting inability to be present had also been received from Mr. R. D.



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The report, which was read by Mr. Reynolds, secretary, stated that the results of the examinations for the session 1893-4 compared, on the whole, favourably with those of the previous session. In May 1893, 717 individual students were examined in science, and 743 certificates were gained; in 1894, 693 students examined gained 780 certificates; in 1893, six first-class honours, thirteen second-class honours, eighty-seven first-class advanced, 279 second-class advanced, 322 elementary pass, as compared with nine first-class honours, ten second-class honours, eighty-eight first-class advanced, 225 second-class advanced, and 402 elementary pass, showing an increase of three first-class honours, one first-class advanced, and eighty pass for first-class elementary, with a decrease of three second-class honours, fifty-four second-class advanced. Two Queen's medals in the honours stage had been awarded, being the same as in 1893, and one Queen's Prize, against two in 1893. One Royal Exhibition of 50*l.* per annum for three years had been awarded, against two in the previous year. The results of the examinations conducted under the auspices of the City and Guilds of London Institute had again proved highly satisfactory, the school retaining the position it has held for so many years—in fact, since the establishment of these examinations—as the first in the kingdom alike in respect of the number enrolled in the technological classes, the number of subjects taught, the number of students examined and successful, and in the number of medals awarded. In 1894, five silver and thirteen bronze medals were obtained and 23*l.* in prizes; in 1893, ten silver and seven bronze medals, with 27*l.* 10*s.* in prizes. The following were the successful medallists:—F. W. Acheson, cotton weaving; S. B. Bennett, plumbers' work; S. E. Burrows, dressmaking; W. H. Cockcroft, carpentry and joinery; E. A. Coups, lithography; A. Crabtree, cotton spinning; A. E. Follows, cotton dyeing; W. H. Hopwood, coal-tar products; J. Mottram, carpentry and joinery; A. Ramsden, cotton dyeing; F. Riley, calico and linen printing; H. F. Robinson, coal-tar products; E. F. Roby, coal-tar products; H. Stoddard, cotton weaving. At the commercial examinations of the Society of Arts held in March, 1894, ninety-four students were examined, of whom eighty-six received certificates. The number of students examined by the Union of Lancashire and Cheshire Institutes in 1894 was 361, who were awarded 343 certificates. J. H. Harrison, a day student, gained a Lancashire County Council

scholarship, value 60*l.* per annum for three years, tenable at the Owens College, and H. Ingram, W. J. Mitchell, and T. C. Elliott gained Lancashire County Council evening exhibitions of 10*l.* for one year. The following students of the school gained Manchester County Council scholarships, value 30*l.* per annum for three years, tenable at the Municipal Technical School:—J. L. Bowers, E. Crompton, A. Goodbehere, F. Nasmith, W. H. Omblor, N. Roberts, J. Rundbaken, and J. D'Ewart, T. C. Elliott, W. B. Green, evening exhibitions, value 10*l.* per annum for two years. W. Spensley gained a Manchester County Council evening exhibition, value 10*l.* per annum for two years, tenable at the Owens College. The local prizes were awarded as follows:—Mechanical engineering department: First year's course, 1, J. C. Wilson; 2, H. Pier-son; 3, A. Holden. Electrical engineering department: Second year's course, F. O. L. Chorlton; third year's course, J. Landstein. Chemical department: First year's course, 1, R. E. Grayson; 2, Margaret A. Pepper; second year's course, 1, A. Ramsden; 2, L. Anderson; 3, J. E. Doodson. Spinning and weaving department: First year's course, 1, A. Crabtree; 2, G. W. Phillips; 3, W. Slater; second year's course, 1, F. Collier; 2, W. G. Warburton. Home work prizes were also awarded to A. Crabtree and W. G. Warburton. The free scholarship, value 6*l.* for one year, in the Manual and Commercial School was awarded to C. H. Sankey, and prizes for efficiency were granted to R. Lord, W. Warmisham, H. Rowland, T. Weir, A. C. Brock, P. E. Omblor, A. K. Swain, C. W. Moore, and J. J. Edmondson. Forty-four students had gained forty-nine prizes in the advanced and honours stages, and 164 students 188 prizes in the elementary and ordinary stages of science and technology, having obtained first-class certificates and made twenty-five attendances during the session ending May, 1894. The Heywood local exhibition of 50*l.* for one year (due to the generosity of Mr Charles J. Heywood) had been gained by W. C. Laidler, who elected to hold it at the Owens College. J. H. Hardy, who gained the exhibition in 1893, had succeeded in gaining a Royal exhibition value 50*l.* for two years, tenable at the Royal College of Science, Dublin; he had also gained the second prize in theoretical and practical physics at that college.

The Chairman said they were privileged to have the Bishop of Manchester to distribute the prizes.

The Bishop, before distributing the prizes, delivered a short address. We all knew, he said, that technical instruction was a commercial necessity of our position. England could not

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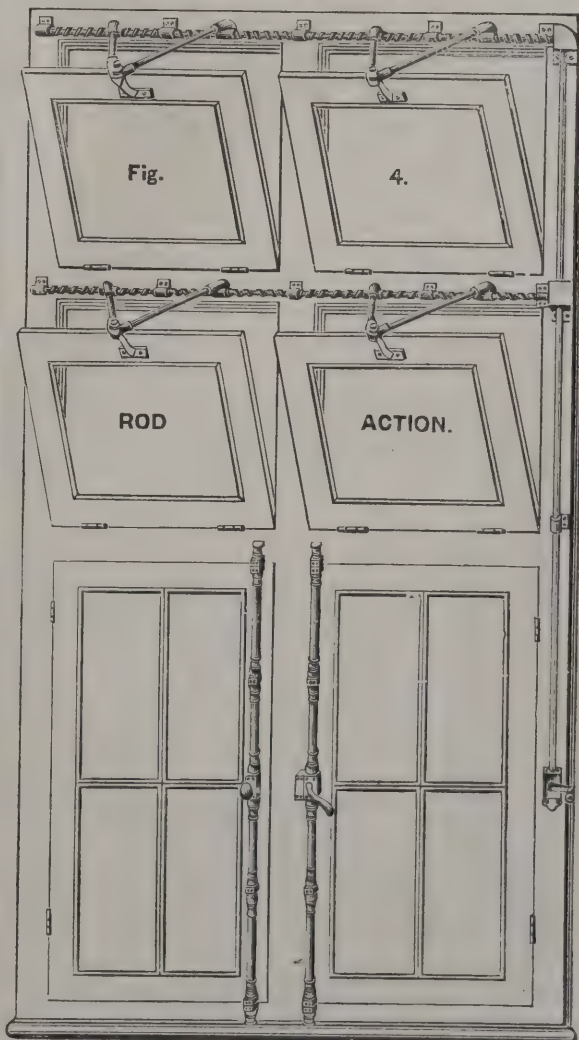
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feed herself unless she maintained her present commercial and industrial supremacy, and she could not maintain that supremacy unless she was able to compete with the well-instructed inhabitants of Continental states, and she would never be able to do that unless our young men possessed a large store of technical knowledge and skill. But technical instruction was not only necessary to our commercial position: it was also of the highest advantage to the individual students. There was nothing more dreary and uninteresting than the mechanical repetition of processes which we did not understand. As he made an inspection of the various Church schools of the Manchester diocese he found that the only children who gave him bright answers in vulgar fractions were those to whom their masters had explained the reasons for the rules which they applied. Now he was told that it was the main aim of these technical schools to teach people the scientific principles which regulated all the processes of their industry. When the students understood those principles, they would be interested in their work; they would have an added dignity in their work, and by the suggestion of improvements in their processes they would become a distinct advantage both to the students and to the community which was happy enough to possess them. Just think of the number of hours all of them had to spend in their daily work. They could easily see what an enormous advantage it was, how valuable, almost beyond computation, was the power in the hands of our young people of making that daily work an improvement and a delight. Then not only would a man make better work, but, what was of far more importance, the work would educate and delight the man. Then he dared say there were certain indirect advantages of technical instruction which might not have suggested themselves to many of his hearers. They knew that one of the most important and interesting of the movements of modern times was the attempt to increase the wages of manual labourers. He believed that many of the movements which were now popular would not tend to attain that end, but he had no doubt at all that the increase of technical instruction would promote it greatly. In the first place, it would tend to make labour more efficient by the improvement of the labourer, and by the improvement of the processes of work, so that we should be able to compete on easier terms with those less instructed races who were satisfied with lower wages and longer hours of work. Then, in the next place, we should be able by increased technical instruction to cheapen the cost of managing our great industrial concerns. How did they think, the standard of industrial proficiency being the same,

they could cheapen anything? By simply increasing its quantity. Why was it that during the last thirty or forty years the price we paid for the use of money had been declining? Why was it, for instance, that the interest upon municipal bonds had diminished from 5 per cent. to 3 per cent.? How was it that Government, which used to be obliged to pay $3\frac{1}{2}$ per cent. for Consols, was now enabled to borrow money at $2\frac{1}{4}$ per cent., speedily to be reduced to $2\frac{1}{2}$ per cent.? It was owing to the amount of capital competing for investment. So they saw just in proportion to the increase of thrift was the diminution of the price people paid for money, and therefore when capital was cheap and men paid less for its use there was a certain margin of profit which might be added to the wages of the labourer. Well, it was just the same with industrial instruction. A little time ago he was speaking to a large body of people who had confederated themselves together for the promotion of co-operative production, and he had to say to them: "Gentlemen, you have constantly failed in your attempts to make this a means of improving the position of the working-class, and I believe one of the main reasons why you fail is that you have not got sufficiently skilled management, and the reason that you have not got it is that you won't pay the market price for it." Now, the market price at present happened to be rather high, because there were but few skilled managers of large concerns. Now if by technical instruction they enabled young men to apply their natural ability to the management of great concerns, there would be more skilled managers in the market competing for employment, and their price would go down, the cost of management would be less, and if that was less it might be possible to add what was saved to the wages of the labourer. So if one class lost something, the class to which many of his hearers belonged gained a great deal. Probably some of those who intended to be managers did not like the prospect of a reduction of the price. To them he had one or two things to say. First of all, it was far more important to have a large number of persons moderately well paid than a small number of persons extravagantly paid. No doubt there would be fewer prizes for persons who were blessed with splendid genius, but then we were not all of us possessed of splendid genius. The majority of us were persons of very moderate talent, who were doing the best we could to improve our talent. Well, if by the cheapening of the cost of management a larger number of co-operative productive societies could be made successful, there would be many more managers wanted, and therefore a con-

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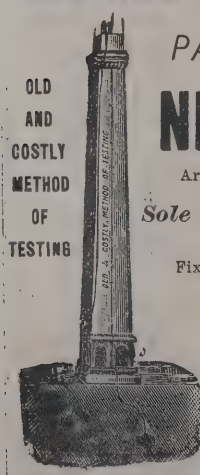
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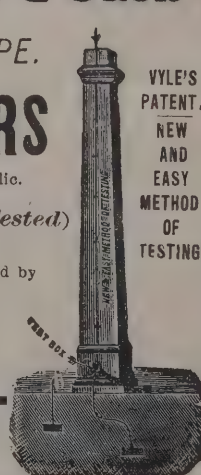
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siderable number of the students might look forward in the future to positions of great honour which would be fairly remunerative. Another thing he had to say was this. He trusted that our education was not only intellectual, but even more—that it was ethical. Now, if it be so, they would know that the noblest man was not the man who earned the greatest sum of money, but the man who blesses the largest number of his fellow-creatures. If they wanted to have their lives great lives, if they wanted to do as much good to others as possible and to gain as high an amount of happiness for themselves as possible, if they wanted to make this poor world better for the work they had done in it, then they would adopt as the principle of their lives this great principle—that the highest reward of a man's life is the reward of doing good to the greatest number of his fellow-creatures. Now it was because he believed that technical instruction would put into their hands the means of doing this, far more than for any other reason, that he heartily wished success to these most promising institutions. The prizes were then distributed.

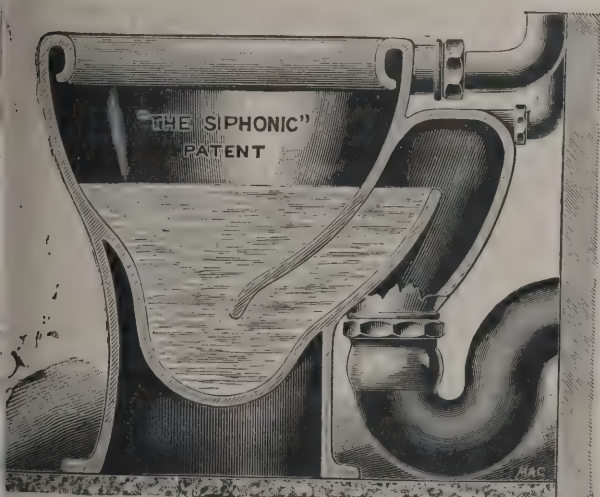
ACQUIRING LAND FOR PUBLIC PURPOSES IN NEW SOUTH WALES.

THE following case, which has been tried in the Supreme Court of New South Wales, indicates that the Corporation of Manchester is not the only public body that is expected to pay an extravagant price for land. The action in question was brought by Mr. Alexander Amos, railway contractor, against the railway commissioners of New South Wales, to recover the sum of 209,800*l.* for the resumption of a little over twelve acres of land in the district of Bowral. The land in question, which was resumed by the Government for the purpose of quarrying stone and ballast for railway construction, was situated at a place called The Gib, between Mittagong and Bowral, and not far from the railway line. The plaintiff claimed that this land or quarry contained some of the best building stone in the colony, and that there were 15,000,000 tons of more or less valuable stone down to the railway line. The land included a hill which rose to a height of 200 feet. For the first part it had a gentle incline, then there was an abrupt ascent for a distance of 50 feet, then another gradual ascent, terminating with another precipitous face. This hill contained some of the best building stone known, and which was rapidly supplanting Victorian bluestone, owing to its superior strength and

durability. It was also capable of receiving a high polish, and its contiguity to the railway line made the property still more valuable, as a tramway could easily be constructed to it for the purpose of removing the stone. The plaintiff's estimate of the value of the property to him was arrived at by taking a datum point level with the railway line and making a valuation of the first-class stone available above that point. One engineer had computed the quantity of this stone in the hill at 2,921,000 cubic yards, and another at 3,875,000 cubic yards, and as 2½ cubic yards of this stone went to the ton, that would give between 8,000 and 9,000 tons of stone above the datum point, without estimating the stone below. The defendants pleaded that they had valued the property at 1,500*l.*, which had been tendered to plaintiff and refused.

Mr. G. Allen Mansfield, architect, stated that he knew The Gib, where a quantity of trachyte stone existed, and he had used that stone since 1888. It was used in the Australia Hotel, principally in the foundations for the columns. Trachyte was very much harder than Pymont sandstone, and even than granite, and it took a high polish. If a person desired to erect a building of Pymont sandstone at a cost of 20,000*l.*, and he afterwards determined to use trachyte instead, it would cost about 45,000*l.* George M'Crae, city architect, said that trachyte was used to the extent of 4,000 cubic feet in the bases of the Belmore market. It was also used for the portico of the new portion of the town hall and the new markets in George Street, from the ground to the shop floors. He believed it was also extensively used by the Municipal Council for kerbing and guttering. Although expensive to work, trachyte being very durable, was largely used for base-courses and rough work. It was harder and more durable than sandstone or Melbourne bluestone. The first cost of trachyte was greater, but it was cheaper in the end, as it was comparatively indestructible. A building of trachyte would cost about double one of sandstone, but it would last very much longer. In the Centennial Hall, which was finished nine or ten years ago, the sandstone cornices were fretting away, whereas trachyte would not exhibit that defect perhaps for hundreds of years.

William Henry Warren, Challis Professor of Engineering in the Sydney University, said he had tested a block of trachyte, and found it much more durable than sandstone or bluestone. It appeared to be impervious to water, and was not liable to wear away rapidly by friction. For that reason it was the best stone that could be used for ballast purposes on the railways.



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The City Surveyor stated that since 1889 trachyte had superseded bluestone for kerbing and guttering and paving for municipal purposes. In 1889 5,991 lineal feet were used, at a cost of 860*l.* 7*s.* 1*d.*; 1890, 4,721 lineal feet, at a cost of 690*l.* 12*s.*; 1891, 13,401 lineal feet, at a cost of 1,943*l.* 2*s.* 7*d.*; 1892, 15,388 lineal feet, 2,626*l.* 11*s.* 2*d.*; 1893, 27,469 lineal feet of kerbing and guttering, 4,367*l.* 11*s.* 10*d.*; and up to September 1894, 7,700 square yards of paving, at 5,186*l.* 10*s.* 8*d.* Evidence was also given of the rent paid to owners of quarries in the same locality as "The Gib," and the value of the stone per cubic yard delivered in Sydney. One witness stated that there was sufficient trachyte in the Bowral district to last for hundreds of years; in fact, it was practically inexhaustible, as it extended over about two miles of country.

John Young said that 150,000 tons per year was a proper output for the plaintiff's property, which should return a royalty of about 16,000*l.* per annum, calculated on the following basis:—6*s.* per ton for first-class stone, 1*s.* 6*d.* per ton for second-class stone, and 6*d.* per ton for spalls or metal, which would give 12,000*l.* for first-class stone, 3,000*l.* for second-class stone, and 1,000*l.* for spalls.

Plaintiff was also examined, and said that he obtained the quarry in 1881, and he knew of the value of the stone when he bought the property. Mr. Richard Teece, manager and actuary of the Australian Mutual Provident Society, was called, and asked to capitalise the present value of a property which would yield 16,000*l.* per annum for fifty years; but the question was objected to, and at four o'clock further argument was adjourned till the following day.

On the second day the question of the advisability of actuarial evidence tendered on the previous day to prove the capitalised value of the property on an estimated income of 16,000*l.* per annum for fifty years was concluded, and the evidence was rejected. Plaintiff's case then closed.

His Honour Justice Innes suggested that the property be given back to the plaintiff and an account taken of the value of the stone removed by the defendants. Payment of the amount could then be made to the plaintiff. On the other hand, if plaintiff upon resuming possession of the land derived any benefit from the tram-line and other works constructed by the defendants, he should allow them compensation for that benefit; if he derived no benefit, plaintiff need allow nothing for it. The adoption of this suggestion would save enormous expense in protracted and most costly litigation—no less than seven

counsel of eminence being in it—and would really be a very fair test of the bona-fides of both parties. Here was a case where a plaintiff was claiming 209,800*l.* for a property which the Government said was not worth 1,500*l.* On the one hand, the Government had no right to take away an inch of the plaintiff's land or an ounce of the stone upon it without making him full compensation for the property of which he was deprived. On the other hand, the public—the taxpayers—might be called upon to pay a sum altogether extravagant and out of all proportion to the value of the property resumed. Now, if this property really was so valuable as the plaintiff alleged, he should either have it back or be compensated for it. It could not be essential to the Government to retain it. It was not like the case of land resumed for some special public purpose, as, for instance, the contemplated enlargement of an already existing public building, where the Government must have the particular piece of land in question for the purpose; and full justice might be done by adopting the suggestion he threw out. The public might then derive some benefit from it eventually by Mr. Amos paying an income tax on 16,000*l.* per annum, or a property tax upon the capital value of property worth, as he alleged, over 200,000*l.* His Honour added that he had often thought that there should be a right, if the Government considered that an extravagant or dishonest claim had been made, to return the property rather than submit the in many cases undoubtedly difficult question of compensation to a jury. This was somewhat analogous to the right which existed in the Customs officers if an importer, in their opinion, dishonestly valued property imported at very considerably less than its real value, to take the commodity and pay the importer the value so fixed by himself. This would in many cases act as a salutary check on attempted imposition upon the public. He must not be misunderstood as suggesting for one moment that the claim of the plaintiff in this case was either extravagant or dishonest. That was not in any way for him to determine or pronounce upon.

Afterwards the judge held a consultation with counsel, and on returning to Court, informed the jury that he had every reason to hope that the matter was in fair train for settlement upon the basis of the main arrangement suggested by him—namely, the restitution of the land. Of course, this was an important matter, and required to be carefully considered. One matter of detail had already been arranged, and he hoped that another detail would also be arranged satisfactorily, so as

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to put an end to the necessity of protracted and costly litigation, or of going to a verdict which possibly might not be satisfactory to one side or the other. He said this without in any way disparaging the jury, because the case was a difficult one to decide. Under all the circumstances of the case, he had no difficulty in acceding to the request of counsel for the plaintiff to adjourn until to-morrow, as the interval might be much more profitably utilised in arranging the necessary details of the settlement than in taking further evidence.

The hearing of the case was resumed on the following day, and after a conference between leading counsel for the parties and a reference to His Honour on some material point at issue, the following agreement was arrived at:—"Plaintiff to take back the resumed land. Dr. Sly to take evidence and determine the amount of stone taken from the twelve acres, and allow for same at a fair royalty in view of the value of the stone taken. Defendants to pay amount of such royalty less value of work done by defendants to the quarry which has had the effect of improving the same for quarrying purposes. Costs of action as between party and party to be paid by defendants, and each party to pay their own costs of further inquiry before Dr. Sly."

His Honour said he thought the jury would agree with him that the arrangement was a fair and equitable one, which saved them a good deal of troublesome discussion. Whatever they might have felt in regard to the case, there was always a possibility of injustice being done if it were fought out, whereas, under the arrangement arrived at, no real injustice could happen either to claimant or to the public, who would have to pay the compensation. He was sure that the settlement was a proper one in the interests of both parties.

The foreman mentioned that the jurors were satisfied with the arrangement arrived at.

A juror was then withdrawn and the case terminated.

THE MANCHESTER SHIP CANAL.

A MEETING of the Manchester Association of Engineers was held on Saturday night, when there was a large attendance of members.

Sir E. Leader Williams, the president, after thanking the members for the honour they had conferred upon him by electing him to the chair for the ensuing year, proceeded to

deliver the annual address. He said it had to some extent been customary on these occasions to review the improvements in engineering science since the last address; but on this occasion he should confine himself to the branch of their profession in which he had been most closely engaged. The early history of canals was a matter of some interest. The advantages of inland navigation were obviously so great that the Royal Canal in China was constructed as early as the year 980. Its length was upwards of 825 miles, and with many branches in addition to the main canal. It occupied 30,000 men forty-three years in construction. The Suez and the Corinth Canals almost traversed the same ground that was occupied by early canals of smaller size. In England the Romans constructed canals, one of which—the Foss Dyke Navigation—still was used. It connected the river Witham at Lincoln with the river Trent at Torksey. The introduction of locks enabled canals to be constructed through a country requiring different levels, thus saving great cost in excavation. There was some doubt as to the date of their introduction. Flushes in rivers were used before locks were invented, which appeared to have been in Italy in the fifteenth century. In the year 1481 two brothers of Viterbo, named Domenico, watchmakers, designed a chamber with a double pair of gates for canals, and it was adopted in the Canal della Martesana. No waterway is more important to commerce than the Suez Canal, which was the complete fulfilment of the early canals made across the same isthmus so far back as the reign of Darius. The Suez Canal was the only ship canal of one uniform level without locks, but the failure of the Panama Canal was largely due to M. de Lesseps' attempt to apply this system where it was not properly applicable. During M. de Lesseps' last visit to Manchester he (Sir E. Leader Williams) had several conversations with him in reference to the Panama Canal. The capital had not then been raised for the works of the Manchester Ship Canal, but they were overlooking the site of the canal and docks at Manchester. Discussing the question of locks in ship canals, M. de Lesseps said his success on the Suez Canal was such as to prove that the Panama Canal could be constructed and worked without locks. He (Sir Leader Williams) replied the two cases were not similar. M. de Lesseps' answer was that the English engineers were wrong as to the Suez Canal, and locks were not necessary at Panama. In 1888, however, the original plans of the Panama Canal had to be altered, and eight locks were designed to reduce the amount of the great Culebra excavation. This alteration was too late to save the canal. M. de Lesseps

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did not dispute the advantage of locks on the Manchester Ship Canal, as the raising of the water to a level which admitted of shipping lying on the canal alongside wharves or works at a suitable height above the canal for loading or discharging was, he considered, a great advantage in a canal which was virtually an elongated dock. Sir Leader Williams went on to deal with the construction of the Manchester Ship Canal. The work, he said, was one with which his name was identified, but he should ever remember that the successful completion of the canal was due to the combined energy of men who had given much time and money to the undertaking, and also to the way in which the staff of the company had worked together from first to last. In the course of his description of the canal he pointed out that from Latchford to Manchester (a distance of 14½ miles) the canal was filled with the waters of the rivers Mersey, Irwell, Bollin and Glazebrook. The canal being designed to take the place of the rivers Irwell and Mersey from Manchester to Latchford, it thus became a canalised river, continuing to be the main drain for Lancashire and Cheshire, large sluices being provided at each set of locks to deal with land floods and surplus water. Owing to the sewage of Manchester, Salford and all other towns on the rivers Irwell and Mersey and their tributaries being allowed to flow into the rivers without purification, the state of the water had become very bad. Salford had now completed a system of intercepting sewers, and was about to purify the sewage at works constructed at Mode Wheel. Sewage works were now being constructed by Manchester, and as the turning of crude sewage into rivers or streams was contrary to the law as well as injurious to health, the other towns above Manchester must take immediate steps to prevent their sewage polluting the canal. Some of them had now got this necessary work in hand. He reminded the meeting that when he read a paper on the Ship Canal before the Fourth International Congress of Inland Navigation, held at Manchester in 1890, he said steamers would be able to navigate day or night, using the electric light. This had proved to be correct, even where vessels had not on board the electric light, which was provided as fixed light at the docks and locks. He, however, named ten hours as the time steamers would take to traverse the canal; the result was that time was seldom taken, the passage generally occupying seven to eight hours, passenger steamers even taking considerably less time. Messrs. Burns's steamers working between Manchester and Glasgow had averaged, on 236 passages made during the year 1894, only 6 hours 33 minutes; 117 passages were made at night. He

added that he could see no reason why Lancashire, so famed for its machine-shops, its boiler-makers, and its artisans, could not establish on the banks of the Ship Canal works which should be able to compete with other districts for ship-building. Much had been said and written with regard to the estimates of the canal, and as usual in such cases, the strongest statements had been made by those who were least acquainted with the facts. The original capital of the company was 10,000,000*l.* The Parliamentary estimate for works and land was 7,292,972*l.*; to this must be added 1,780,000*l.*, the cost of the Bridgewater Canal and Mersey and Irwell Navigations, including conveyancing and additional works. The balance had to meet the cost of obtaining the Act, which was very heavy after several years' contests, cost of raising the capital, and the payment of interest during portion of the construction. The works were let to responsible contractors well within the Parliamentary estimate of 1885, but, most unfortunately, the plans had to be approved by numerous public bodies and companies who were affected by them. Alterations of the most serious character had to be carried out, involving great additional expense, some of which were entirely unnecessary, as events had since proved. Great improvements were made in enlarging the area of the docks and putting in locks at Mode Wheel, additional Parliamentary powers being obtained in 1888. Large three-storey transit sheds had been constructed at the docks, and many other works had been ordered that were not in the original plans. Large quantities of land had been purchased in excess of the land estimate, which was a valuable asset, if not immediately available. Owing to the unfortunate death of the contractor, Mr. Walker, the company took over the contracts and the plant, involving a sum of 860,000*l.* that had been advanced upon it, and which by the contract would have been deducted from the payments to the contractor if he had completed the work. The contractor had no floods during the period he was working, but the company had to bear the loss of several floods of the most serious character. The cost of repairing damages to works and plant, pumping out water, and heavy delay to the work, was very large. The last step was to re-let the works to other contractors, and it was obvious that to complete a work under such circumstances enhanced prices had to be paid. If the original plans could have been adhered to, as they would have been if outsiders had not had so much control of them and Mr. Walker had had time to complete his contract, the result to the company would have been very different. The delay caused by his death entailed the payment of additional interest to the

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debenture-holders. The works in the estuary, and indeed at all points, involved considerable contingencies, and there could be no doubt that the ordinary amount of 10 per cent. which was added to the estimate for contingencies had proved to be too small; but no engineer could have contemplated that his plans would be so altered, or that the contractor, after doing the part of the work that was most easy, would unfortunately pass away, leaving such a legacy of trouble behind him. Still, the canal was completed; the results of the first year had been to prove its efficient working, and he had not lost his faith in its future. Rome was not built in a day, and it could not reasonably be expected that, amid the severe competition that had to be encountered, even the energetic management that was now dealing with traffic matters could all at once force from hostile or lukewarm traders the business which must ultimately come to the canal, because no large waterway leading to a great manufacturing district could fail ultimately to obtain the traffic which was due to the advantages it offered.

Mr. T. Daniels proposed a vote of thanks to the President for his address, and said there could be no doubt that, had the Ship Canal been constructed forty or fifty years ago, the district between Manchester and Warrington would have presented a very different appearance to-day. He had every confidence that although they would now have to wait for a result which might already have been achieved had there been more enterprise in the past, yet that result would ultimately be forthcoming.

Mr. T. Ashbury seconded the resolution, which was adopted unanimously.

MODEL TENDERING.

THERE cannot be too little secrecy in tendering. In the first place, when full information is given it becomes evident whether dishonest or inadequate prices are accepted. It is constantly said that totals are far too low, and there is consequently a common opinion that the mean between the highest and lowest tenders is usually the fairest, and has the best right to be accepted. When some clue to details is given it can be inferred whether a contractor has special facilities for dealing with a particular class of work. The publication of ample information is also a boon to contractors as well as to architects and engineers. The following announcement of the tenders received by Messrs. Potter & Folwell, engineers, New

York, on December 20, for drainage work at West Pittston, Pa., is a model of above-board dealing:—

General conditions.—Character of digging:—Loam, average depth 6 feet, underlaid with gravel. No rock boulders or quicksand. Vitrified pipe, single strength up to 20-inch, remainder double strength. Brick sewers 8-inch work, inner ring to springing line laid in Portland cement. Concrete bottom in egg-shaped sewers. Right reserved to omit construction of any portion of the work. Monthly payments 85 per cent. Time of completion, July 1, 1895. McGarry & McGowan, Akron, O., \$36,459.72; Acocck & Son, Trenton, N. J., \$39,266.17; Ryan & Avery, Watertown, N. Y., \$39,553.17; A. Emonson, Carlisle, Ark., \$39,602.61; Headley & Christie, Newark, N. J., \$42,320.11; T. H. Ryan, North Tonawanda, N. Y., \$42,376.65; Corcoran & Connell, Pittsburg, Pa., \$43,022.47; W. Franklin, Buffalo, N. Y., \$43,319.63; A. W. Bryne, West Medford, Mass., \$44,531.35; Henry M. Dowd & Co., Orange, N. J., \$45,481.50; P. J. Cleary, Shenandoah, Pa., \$45,780.3; James McCloud & Co., Williamsport, Pa., \$46,160.90; Coon, Mooney & Co., Kingston, Pa., \$46,268; Sanders & Houston, Pittsburg, Pa., \$46,462.74; Lindsay & Van Loon, Plymouth, Pa., \$47,672.94; Dunn Brothers, Scranton, Pa., \$47,915.79; Hart & Gibbons, Wilkesbarre, Pa., \$51,152.46; Batton & Van Bussum, New York City, \$51,372.57; Brodhead & McConville, Scranton, Pa., \$54,350.3; R. C. Mitchell, Plains, Pa., \$54,929.17; Frederick Hurdler, Wilkesbarre, Pa., \$56,670.93; T. M. Leshner & Son, Easton, Pa., \$62,064.3; Sullivan Brothers, Philadelphia, Pa., \$68,999.9.

The lowest detail figures were:—

Lowest bidder for tile-sewer, Acocck & Son, Trenton, N. J.—6,685 feet of 8-inch pipe in trench under 8 feet deep, 33 cents per foot; 3,992 feet of 8-inch pipe 8 to 10 feet deep, 38 cents per foot; 635 feet of 8-inch pipe, 10 to 12 feet deep, 43 cents per foot; 1,225 feet of 8-inch pipe, 12 to 14 feet deep, 48 cents per foot; 330 feet of 8-inch pipe, 14 to 16 feet deep, 53 cents per foot; 250 feet of 8-inch pipe, 16 to 18 feet deep, 58 cents per foot; 455 feet of 8-inch pipe, 18 to 20 feet deep, 63 cents per foot; 180 feet of 12-inch pipe, under 8 feet deep, 43 cents per foot; 750 feet of 12-inch pipe, 8 to 10 feet deep, 48 cents per foot; 4,332 feet of 15-inch pipe, 7 to 12 feet deep, 52½ cents per foot; 565 feet of 18-inch pipe, under 8 feet deep, 63 cents per foot; 950 feet of 18-inch pipe, 8 to 12 feet deep, 68 cents per foot; 600 feet of 20-inch pipe under 8 feet deep, 75 cents per foot; 1,260 feet of 20-inch pipe, 8 to 12 feet deep, 80 cents per foot; 350 feet of 22-inch pipe, under 8 feet deep, 86 cents per



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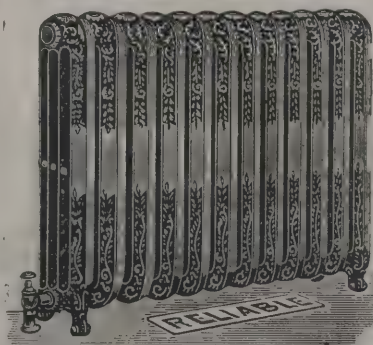
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Lowest bidder for brick sewers, McGarry & McGowan, Akron, O.—260 feet of 2 feet 4 inches by 3 feet 6 inches 12 to 16 feet deep, \$2.45 per foot; 410 feet of 2 feet 4 inches by 3 feet 6 inches 16 to 20 feet deep, \$2.75; 1,205 feet of 2 feet 6 inches by 3 feet 9 inches 10 to 16 feet deep, \$2.40; 485 feet of 2 feet 10 inches by 4 feet 3 inches under 8 feet deep, \$2.50; 325 feet of 2 feet 10 inches by 4 feet 3 inches 8 to 12 feet deep, \$2.60; 363 feet of 3 feet 4 inches by 5 feet under 8 feet deep, \$2.90; 375 feet of 3 feet 4 inches by 5 feet 8 to 10 feet deep, \$2.95; 150 feet of 36 inches 10 to 6 feet deep, \$2.50; 257 feet of 50 inches 8 to 13 feet deep, \$3—total, \$10,018.95.

Lowest bidder for appurtenances, Acock & Son, Trenton, N.J.—Eight flush tanks, \$30 each; 37 manholes under 10 feet deep, \$25 each; manholes over 10 feet deep, per foot extra, \$3 each; 18 intersecting manholes, \$30 each; drop manholes, per foot of drop, \$3; 85 deep-cut connections, 400 feet at 25 cents per foot; two lampholes, \$12 each; 44 catch-basins, \$50 each; 38,600 lbs. cast-iron covers for manholes, &c., 2 cents per lb; 1,000 feet, board measure, oak timber in foundations, \$30 per M.; 5,000 feet, board measure, hemlock sheathing, \$15 per M.—total, \$4,906.

CALCULATION OF WEIGHT OF IRON.*

BEAR in mind that a cubic foot of iron weighs 480 lbs., therefore an inch thick and foot square is 40 lbs., or one-twelfth of the cube foot. Therefore, also, half an inch equals 20 lbs., one-quarter inch equals 10 lbs., one-eighth inch equals 5 lbs., one-

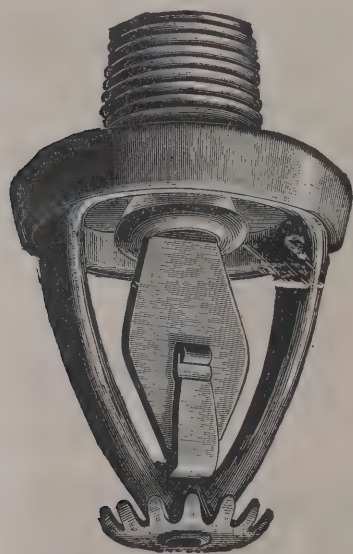
sixteenth inch equals 2½ lbs., one-thirty-second inch equals 1½ lbs. You need not try to remember these, as by a quick mental process you can start with the foot or inch and in less time than it requires to write this, halve the inch, then halve the half inch, then the quarter and so on.

Now if your scantling be 3 inches by 1 inch, and as 1 inch a foot square is 40 lbs., the 3 inch bar will be one-quarter of 40 lbs., or 10 lbs. If your bar is 4 inches wide, or one-third of a foot, you will have one-third of 40 lbs., or 13½ lbs. For one-half inch bar, or one-quarter inch, or one-eighth inch, &c., the same process holds goods. For instance, a bar one-quarter inch thick and 2 inches wide will be the sixth part of a square foot, or the sixth part of 5 lbs., or five-sixths of a lb, since 5 lbs. by six thirty-sixths and thirty sixths divided by six gives five, or five-sixths lb., as just stated. Three inches by one-quarter inch will be one-quarter of 5 lbs., or 1¼ lbs., and so on.

Now take a bar 1 inch square, and since a foot inch is 40 lbs., the 1 inch bar will be one-twelfth of 40 lbs., or 3½ lbs., to the lineal foot. If the bar be 1 inch by 1½ inch, and as 1½ inch is one-eighth of a foot, the bar will weigh one-eighth of 40 lbs., or 5 lbs., since 8 into 40 gives 5 times. And if the bar be one-half inch by 1½ inch, it will be one-eighth of 20 lbs., or 2½ lbs. If the bar be 3 inches by one-quarter inch it will be one-quarter of 10 lbs., or 2½ lbs., and if one-eighth inch by 3 inches, 1¼ lbs., or the quarter of 5 lbs.

Say now your bar is seven-eighths inch square, and as an attempt to divide 12 inches or a foot by seven-eighths inch would lead to a more difficult or lengthy process, do it this way. Spread it over mentally into eighths of an inch. Thus seven times seven-eighths = 49 eighths, or 6½ inches in width of one-eighth inch thick iron. Now take for 6 inches (half a foot) the half of 5 lbs., or 2½ lbs., but there is still one-eighth inch by one-eighth unaccounted for, which, being only 1-48th of the 2½ lbs., may either be disregarded as a very small fraction of about 2 per cent.; or, if we wish to be more exact, and as it is mentally difficult, or even with pen or pencil, to get at the 48th part of 2½ lbs., reduce your 2½ lbs. to ounces, giving 40 ozs., and now you see that to the 2½ lbs. arrived at as above you have to add 0.83 of an ounce, or say four-fifths of an ounce, or even a whole ounce, as, except for hundreds or thousands of lineal feet, the neglected fraction of an ounce would hardly cover the trouble of exact computation.

Apply now the process to iron 1¼ inch square; reduce the bar in imagination to quarter-inch iron, when it will be 1¼ inches



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by five times, or twenty-five quarters of an inch in width, or $6\frac{1}{4}$ inches, or half a foot plus one twenty-fourth of half a foot, and as quarter-inch iron weighs 10 lbs. to the foot, the 6-inch in width will give 5 lbs., and as 5 lbs. = 80 oz., and as the twenty-fourth part of 80 oz. is $3\frac{1}{2}$ (since three times 24 = 72 and 80 or $\frac{1}{4}$ oz. over), therefore to the aforesaid 5 lbs. add $3\frac{1}{2}$ oz., and the exact weight of the $1\frac{1}{4}$ -inch square bar per lineal foot is 5 lbs. $3\frac{1}{2}$ oz.

Again, if the square bar be $1\frac{1}{8}$ inch or 9-8 inch, and as nine times 9-8 = 81 eighths or $10\frac{1}{8}$ inch, and as 10 inches is the five-sixths of twelve, therefore the bar will weigh per lineal foot the five-sixths or 5 lbs. or of 80 oz. or 66 $\frac{2}{3}$ oz., but there still remains one-eighth inch to be accounted for, which just gives five-sixths oz. more, forming together 67 $\frac{1}{2}$ oz. or 4 lbs. $3\frac{1}{2}$ oz., say 4 $\frac{1}{4}$ lbs. nearly.

This last example may be more easily and quickly computed by taking the bar as so much of a foot of iron $1\frac{1}{8}$ inch thick, or 45 lbs. to the foot, when we get for 1 inch of it one-twelfth of 45 lbs., or $3\frac{3}{4}$ lbs., and for the one-eighth over add one-eighth of $3\frac{3}{4}$ lbs., or one-eighth of 60 oz. = 7 $\frac{1}{2}$ oz., together as before 4 lbs. $3\frac{1}{2}$ oz., or 4 $\frac{1}{4}$ lbs., nearly $3\frac{3}{4}$ lbs.

For computing the weight of sound bar-iron or of solid posts or columns of circular section, the simplest way is to compute as square and then reduce. Well, geometry teaches that the area of a circle is .7854 of its circumference scribing square, or that the area of any square is to be reduced to that of its inscribed circle by a multiplication of said area by the decimal fraction .7854, which is the area of a square of which the diameter is equal to one or unity. These figures .7854 will be better understood as a percentage. Thus, the area of the circle is very slightly in excess of 78 $\frac{1}{2}$ per cent. of its corresponding square. Now, since decimal 76 is equivalent to three-quarters, we therefore have to take, to begin with, three-quarters of the weight of our square bar, which is best and quickest done by taking half of it and then half of that, or a quarter of the whole. Now there still remain to be added 3 $\frac{1}{2}$ per cent. to get at the full weight required. This 3 $\frac{1}{2}$ per cent., or more, correctly $3\frac{5}{100}$ per cent., being multiplied by 7, we get (354 × 7) 2,478, or very nearly 25; therefore the remaining figures 354 of the .7854 are almost exactly equal to one-seventh of 25; therefore, by dividing the weight set opposite to the 25 per cent., or one-quarter of the weight of the square bar or scantling, we get the fraction to be added to the 75 per cent. already obtained to arrive at the comparative weight of the round scantling. Thus then we make unto our-

selves the rule:—To compute weight of round iron calculate it as square, and then take one-half, plus one-quarter, plus one-seventh of one-quarter of weight of square bar, this process being far shorter or more concise than that of multiplying by .7854, which would further require a reduction of the ounces or fractional portions of the weight to a decimal to allow of such multiplication.

Example.

Suppose the weight of one lineal foot of a bar of square iron to be 5 $\frac{1}{2}$ lbs. Thereby the rule, the corresponding weight of the round bar, or weight of a round bar of same size, will be the half of 5 $\frac{1}{2}$ plus the one-seventh of this last, or one-eighth × one-sixteenth or three-sixteenth lbs., together 4 $\frac{1}{10}$ lbs., or 2 $\frac{3}{4}$ lbs., plus the half of this or quarter of the whole, equal 1 $\frac{3}{8}$ lbs. or 4 lbs. 5 oz.

Otherwise, reducing the one-half lbs. to a decimal, we get 5.5 lbs. or reducing again the $\frac{1}{4}$ of which 2.75 " fraction of a lb. to decimals $\frac{1}{2}$ of this 1.375 " 5.5 lbs., and multiplying $\frac{1}{2}$ of this 0.1964 " by 7854

4.3214	39270
	39270
	431970

or 432 very nearly,

which shows that the fraction one-seventh for the remaining decimal 354 of the .7854 differs from it by little more than one-thousandth of a pound.

Now for cast-iron it is true the weight of a cubic foot is only 450 lbs. instead of 480 lbs. for wrought-iron; but as it is always safe in estimating in advance to be on the safe side to make up for any omitted trifling items, I generally use same figures as for wrought-iron; also because when contracted for by weight the tendency is to give the casting as great a weight as possible, and even when the thickness asked for is not exceeded there is generally a slight allowance to be made for so much of the sand or core adhering forcibly to the casting and hard of removal.

Therefore for any straight work or rectangular, as for a girder, column or stanchion of square, rectangular, crucial or cruciform or box-like cross section; estimating the elemental components and putting them together will give the weight or a lineal foot, which into the length or height of the column of girder will give its total weight.

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With regard to circular work, as of a cast-iron column, the inner diameter added to the thickness gives the mean diameter, and this taken $3\frac{1}{7}$ times gives the mean circumference or girth, which into the weight of a lineal foot of the column under consideration, and this last into the length in feet, will be the total weight of the column.

For example, say we have to compute the weight of a column of which the outer diameter is to be 8 inches and the metal $\frac{7}{8}$ inches thick, therefore the inner diameter or base will be $6\frac{1}{4}$ inches and the mean diameter $6\frac{1}{4}$ inches plus $\frac{7}{8}$ inches, or $7\frac{1}{8}$ inches (or which is the same thing, the mean diameter is similarly arrived at as the outer diameter, 8 inches, less the thickness of $\frac{7}{8}$ inch, equal $7\frac{1}{8}$ inches).

Now, diameter $7\frac{1}{8}$ inches by $3\frac{1}{7}$ gives 21 inches three-eighths by one-seventh of $7\frac{1}{8}$ inches, or say 1 inch; therefore mean circumference equals $22\frac{3}{8}$ inches, say $22\frac{1}{2}$ inches, or $1\frac{1}{4}$ feet superficial. Now, iron $\frac{3}{8}$ inch thick equals seven-eighths of 40 lbs. equals 35 lbs (or iron $\frac{1}{8}$ inch thick equals 5 lbs. and seven times 5 lbs. equals 35), and 35 lbs. into $1\frac{1}{4}$ times gives 65 lbs. for foot lineal.

If it be required to weigh any irregular form, such as a statue or piece of carving or scrollwork, of which the cubical contents are unknown, the latter may easily be had by immersion of the object in sand or water in a cylindrical or rectangular box or tub of quick and easy computation, and a mere comparison of the height when just covered by the sand or water with the height or depth of the auxiliary material after removal of the object. Thus, if the box be a foot square in cross section and the filling stand 3 feet high or deep with the object in it, and 2 feet 9 inches after the object is removed, the cubical contents arrived at are a foot square and 3 inches in height, or one-quarter of a cubic foot, or 120 lbs. If the object be hollow, it must of course be inverted in the bath, so the sand or water may fill the hollow space.

Or the weight of an object to be cast of any metal may be made known in advance by weighing the model of it in wood or any other material and by simple rule of three comparing their specific gravities. And in like manner, when the weight is known of any object, its cubic contents may be arrived at by a mere inversion of the terms of their proportion.

Thus of a shapeless piece of stone or wood or metal, the ratio of its cubical contents to those of a cubic foot of the material, from a table of specific gravities, will be the same as that of the weight of a cubic foot of the material to that of the piece to be computed.

In the foregoing mode of obtaining the cubical contents of an irregular figure by immersion in a vessel, if the vessel, instead of being cylindrical or rectangular, has tapering or splayed side, or be the frustum of a cone or pyramid, the contents must of course be computed by the prismoidal formula, which consists in adding to the sum of the areas of the upper and lower bases of the tub or vat four times the middle area (of which the factors are arithmetic means between those of the end areas), and multiplying the result by one-sixth part of the depth or height.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

54. George Chisholme, jun., for "Improvements in and relating to sanitary pipes."

85. Edward Prew, for "Improved system and appliance for utilising the heat resulting from combustion which ascends the chimneys of buildings."

159. John Jones, Frederick Templar Farrer and William Walters Brown, for "Improvements in or relating to water waste preventers or flushing apparatus."

166. Frank Pullen Candy, for "Improvements in and in apparatus for use in or in connection with the purification of sewage or impure waters."

186. George Craig Brown, for "Improvements in and connected with windows."

205. Henry Baxter Worsey, for "Improvements in door-latches and latches for door-locks."

232. William Easun, for "Soil-pipe exhaust to draw the sewer-gas out of ventilating-pipe from drains and diffuse it."

233. George Burgum and George Burgum, jun., for "Window and casement-fastener."

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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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TENDERS, ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

COMPETITIONS OPEN.

DURHAM.—March 25.—Competitive Schemes are Invited for the Sewage Disposal of the District. Premiums 100l. and 50l. for Two Best Schemes. Mr. F. Marshall, Town Clerk, Durham.

IPSWICH.—March 25.—Designs are Invited for the Building of a Workhouse and Infirmary, with Specifications and Estimate. Premiums 100l. and 50l. Mr. A. F. Vulliamy, Clerk to the Guardians.

LEEK.—March 4.—Designs are Invited for Proposed Covered Markets. Premiums 50l., 25l. and 10l. offered. Right reserved to carry out the Work by the Board's Architect. Mr. C. Henshaw, Clerk to the Improvement Commissioners, Leek.

CONTRACTS OPEN.

ASTON-CUM-AUGHTON.—Feb. 5.—For Building Teacher's Residence at Board School. Mr. F. Leonard Sorby, Architect, Todwick, near Sheffield.

BANDON.—Jan. 30.—For Additional Works for Water Supply. Mr. A. Haynes, Executive Sanitary Officer, Bandon, Ireland.

BANGOR.—Feb. 2.—For Building Baptist Chapel at Glanadda. Mr. R. Glynne Davies, Architect, 220 High Street, Bangor.

BATH.—Jan. 26.—For Additions to Lyncombe Schools. Mr. C. Bryan Oliver, Alfred Street, Bath.

BATLEY.—Jan. 28.—For Building Six Terrace Houses, Outbuildings and Boundary Walls. Mr. J. H. Brearley, Architect, Commercial Street, Batley.

BEAUMARIS.—Jan. 29.—For Additions to County School Premises. Mr. Evan Thomas, Borough Surveyor, Beaumaris.

BELFAST.—Jan. 25.—For Stabling at Musgrave Street Constabulary Barracks. Mr. P. J. Tuohy, Secretary, Office of Public Works, Dublin.

BEXLEY.—Jan. 30.—For Supply of Materials for One Year from March 25. Mr. Z. Reeve Boulter, Council Offices, Bexley.

BIDEFORD.—Jan. 31.—For Building Premises for Messrs. Tattersill & Snow. Mr. R. T. Hookway, Architect, Bridgeland Street, Bideford.

BILSTON.—Feb. 9.—For the Construction of Engine-house, Boiler-house, Well-house, Workshop, Coal Shed, Chimney Shaft, Entrance Gates, Fencing, Road-making, &c. Mr. Baldwin Latham, M.I.C.E., 13 Victoria Street, S.W.

BOOTLE.—Jan. 29.—For Steps with Balusters and Retaining-Walls for Terrace in the New Park. The Borough Surveyor.

BROMLEY ST. LEONARD.—Jan. 28.—For Converting Church Institute into Branch Public Library. (Firms in Bromley, Bow or Poplar to tender.) Mr. C. Stanley Peach, Architect, 8 John Street, Adelphi.

BOURNEMOUTH.—Feb. 9.—For Erection of Show Building and Works in Connection with the Royal Counties Agricultural Society. Mr. Charles Simmons, Basingstoke.

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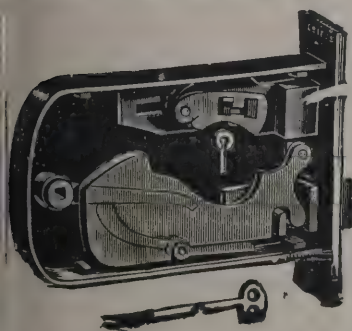
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BRIDGEND.—Jan. 31.—For Building Detached Villa. Messrs. Lambert & Rees, Architects, Bridgend.

BRYMBO.—Feb. 7.—For Additions to the Vron Schools. Mr. W. Moss, Architect, Belgrave Cottage, New Broughton.

CANTERBURY.—Feb. 2.—For Pulling-down Old Premises, St. Radigund's Street, and Building Four Cottages. Mr. W. J. Jennings, Architect, 4 St. Margaret Street, Canterbury.

CARLISLE.—Feb. 11.—For Building House for Private Patients at the Lunatic Asylum. Mr. G. D. Oliver, Architect, Carlisle.

CHELSEA.—Jan. 31.—For the Supply and Execution of Various Articles and Works for a Period of One Year. Mr. T. W. E. Higgins, Surveyor, Town Hall, King's Road, S.W.

CITY OF LONDON.—Jan. 25.—For Construction of Sewer Subway, &c., in Sandy's Row. Engineer, Sewers Offices, Guildhall.

CLONES.—Feb. 4.—For Carrying-out Waterworks. Mr. J. H. H. Swiney, Engineer, Avenue Chambers, Belfast.

COSHAM, HANTS.—Jan. 29.—For the Execution of Outfall Sewage Works. Mr. Graham Whitlock, 97 West Street, Fareham.

CROYDON.—Jan. 28.—For Erection of Boundary Walls at the Infirmary in Mayday Road. Mr. Frederick West, 23 Coombe Road, Croydon.

DEWSBURY.—Jan. 28.—For Rebuilding the George Hotel. Mr. W. H. D. Hersfall, Architect, 9 Harrison Road, Halifax.

DOWNTON.—For Building Board Schools, Board Room and Boundary Walls. Messrs. John Harding & Sons, Architects, 51 Canal, Salisbury.

DUNGARVAN.—Jan. 31.—For Works of Building, &c., at Bathing Place. Mr. Thomas M'Carthy, Town Clerk.

FARNHAM.—Jan. 28.—For Erection of Board Schools and Teachers' Residences. Mr. J. Alfred Eggar, Architect, Farnham.

FARNHAM.—Feb. 5.—For Additions to Wrecchlesham Schools. Mr. W. J. Wells, Architect, West Street, Farnham.

FULHAM.—Jan. 30.—For Making-up and Paving Bedford Place. Mr. Chas. Botterill, Town Hall, Walham Green, S.W.

GODALMING.—Feb. 14.—For Building Cemetery Chapels, Lodge and other Works. Messrs. Welman & Street, Church Street, Godalming.

HARROGATE.—For Building Board School. Mr. T. Edward Marshall, Architect, Prince's Street, Harrogate.

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HASTINGS.—Jan. 29.—For Laying Sewers. Mr. A. R. Inskip, 11 Wellington Square, Hastings.

HAVANT.—Jan. 30.—For Building Classroom and Offices at Board School, Bedhampton. Mr. G. C. Vernon Inkpen, Architect, 6 King's Road, Southsea.

HUDDERSFIELD.—Jan. 31.—For Additions to Meltham Hall. Messrs. John Kirk & Sons, Architects, Huddersfield.

HULL.—Jan. 29.—For Building Shops, Houses, &c. Mr. H. W. Ward, Recorder Office, Beverley.

ISLINGTON.—Jan. 28.—For Paving with Wood Blocks the Carriage-way in Highbury Grove. Mr. J. Patten Barber, Vestry Hall, Upper Street, N.

KEGWORTH.—Jan. 31.—For Building Factory, with Store-rooms, &c. Mr. George H. Barrowcliff, Architect, Loughborough.

KELTY.—Jan. 30.—For Building Premises, Bakery, &c., at Oakfield. Mr. John Houston, Architect, St. Margaret Street, Dunfermline.

KENDAL.—Feb. 4.—For Building Two Pairs of Semi-Detached Houses. Mr. John Stalker, Architect, 57 Highgate, Kendal.

LAUNCESTON.—For Additions to Bolventor School, Altarnum. Messrs. Wise & Wise, Architects, Launceston.

LEEDS.—Jan. 28.—For Reconstructing Roof Lights at Covered Market and Repairing with Durolite Skylights at Victoria Cattle Market. The City Engineer.

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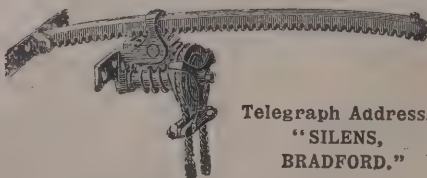
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LONDON.—Feb. 12.—For Constructing Public Conveniences, Bothy, &c., Bostall Heath. Architect's Department, County Hall, Spring Gardens, S.W.

LONGFORD.—Feb. 5.—For Building Methodist Church. Rev. G. W. Rea, Rose Lawn, Longford, Ireland.

MANCHESTER.—Feb. 4.—For Supply and Delivery of about 200 Tons Bessemer Steel Tram Rails and Fish-Plates. Mr. W. H. Talbot, Town Hall, Manchester.

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NEEPSSEND.—Jan. 26.—For Removing and Raising Roof and Building Additional Storey with Oxide Floor at the Sheffield Gas Company's Works. Mr. Fletcher W. Stevenson, Engineer.

NEWBRIDGE.—Jan. 28.—For Building Public Hall of Corrugated Iron. Mr. Wm. Price, Beehive Stores, Newbridge, Mon.

NEWBRIDGE.—Jan. 28.—For Building Mixed School. Mr. George Rosser, Architect, Victoria Buildings, Abercarn.

NORTH-EASTERN RAILWAY.—Feb. 6.—For Erection of Passenger Stations, Goods Warehouse, Weigh Office, Stable, &c. Mr. Wm. Bell, Architect, Central Station, Newcastle-on-Tyne.

NORTH LONDON.—Feb. 11.—For Chimney Shaft, Boiler Setting, &c. Messrs. Thomas & Taylor, 99 Fonthill Road, Finsbury Park, N.

NORWICH.—Feb. 2.—For Supply of Broken Granite for One Year from March 31. Mr. T. H. B. Hislop, C.E., Norwich.

NOTTINGHAM.—Jan. 30.—For Drainage of Club-house. Mr. R. E. Middleton, 17 Victoria Street, S.W.

PAIGNTON.—Jan. 31.—For Construction of Storage Reservoir, Two Filters and Works Connected, for the Local Board. Messrs. John Newton & Son, Engineers, 17 Cooper Street, Manchester.

PENRHIWCEIBER.—Feb. 6.—For Building Fourteen Cottages. Mr. W. James, Penrhybor Villa, Penrhiwceiber.

PLYMOUTH.—Feb. 4.—For Extension of Meat Market and Weighing House. Messrs. King & Lister, Architects, 20 Princess Square, Plymouth.

PONTYPRIDD.—Jan. 30.—For Construction of Tramroad 1 Mile 30 Chains in Length, Laying a 15-inch Cast-iron Conduit Main (1 Mile 55 Chains in Length), Construction of a Reservoir, Seven Filter-beds and Service Tank in Valley of Rhondda Fach River. Mr. Togarmah Rees, C.E., Corn Exchange Chambers, Newport, Mon.

RAINHILL.—Jan. 25.—For Additions, &c., to Infirmary Wards, Lancashire County Lunatic Asylum. Mr. R. C. Lewis, Clerk.

ROTHERHAM.—Feb. 4.—For Building Police Offices, Cells, Courts, &c. Mr. R. J. Lovell, Architect, 46 Queen Victoria Street, E.C.

SNEINTON.—Jan. 31.—For Building Public Baths. Mr. Arthur Brown, Borough Engineer, Guildhall, Nottingham.

SOOTHILL UPPER.—Jan. 28.—For Building Lodge and other Works, Bank Hill. Mr. F. W. Ridgway, Architect, Bond Street, Dewsbury.

SOUTHALL.—Jan. 25.—For the Supply of Leicestershire Granite Cubes and Norway Granite Kerbing. Mr. A. Lawrence Houlder, Council's Office, High Street, Southall.

SOUTHPORT.—Feb. 4.—For Additions to Engine and Boiler House, Electricity Works, Crowlands. The Borough Surveyor.

STAINES.—Jan. 28.—For Works of Sewerage and Sewage Disposal. Mr. G. Maxwell Lawford, Engineer, 13 Victoria Street, Westminster.

ST. MARYLEBONE.—Feb. 1.—For the Supply of Broken Stone Footway Kerb and other Footway Paving. Mr. W. H. Garbutt, Court House, St. Marylebone.

ST. MARYLEBONE.—Feb. 1.—For the Execution of Works and Supply of Materials for One Year from March 25. Mr. W. H. Garbutt, Court House, St. Marylebone.

STOCKPORT.—For Building the Jolly Sailor Public-house. Messrs. Peter, Peirce & Son, Architects, 30 St. Petersgate, Stockport.

SWANSEA.—Feb. 7.—For Erection of a Warehouse. Mr. A. O. Schenk, Harbour Offices, Swansea.

TOTTENHAM.—Jan. 29.—For the Supply of Hard York Paving. Mr. R. E. Murphy, 712 High Road, Tottenham.

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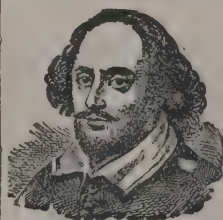
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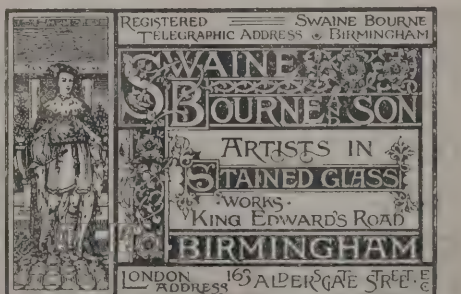
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TROWBRIDGE—Jan. 31.—For Erection of Buildings for the North Wilts Dairy Company. Mr. W. H. Stanley, Architect, Town Hall Chambers, Trowbridge.

WANSTEAD—Feb. 6.—For Building Additions to School. Mr. J. T. Bressey, 70 Bishopsgate Street Within.

WARWICK—Feb. 4.—For Alteration and Additions to the National Schools. Mr. F. N. Moore, 2 Northgate Street, Warwick.

WATFORD—Jan. 25.—For Building Police Barracks, &c. Mr. Urban A. Smith, County Surveyor, 41 Parliament Street, S.W.

WHITEHAVEN—Jan. 26.—For Building House, Moor Row. Messrs. Pickering & Crompton, 11 Lowther Street, Whitehaven.

WOOD GREEN—Jan. 25.—For the Supply of 400 Tree Guards. Mr. C. J. Gunyon, Town Hall, Wood Green.

TENDERS

BRISTOL.

For Rebuilding St. Michael's Schools, Bristol. Mr. Wm. V. GOUGH, Architect, 24 Bridge Street, Bristol.

G. Humphreys, Bristol	£2,488	0	0
J. Browning, Fishponds	2,458	0	0
J. Bastow, Clifton	2,414	0	0
Eastbrook, Bristol	2,411	0	0
H. J. Rossiter, Bedminster	2,395	3	0
T. H. Brown, Bristol	2,339	7	0
M. Durnford, Knowle	2,317	0	0
J. E. Davis, Bristol	2,304	0	0
Bale & Westlake, Clifton	2,292	18	0
H. A. Forse, Bristol	2,291	0	0
W. Cowlin & Son, St. Paul's	2,286	0	0
Hatherly & Carr, Stokes Croft	2,272	0	0
A. J. Beaven, Bedminster	2,253	0	0
Wilkins & Gosling, Bristol	2,192	0	0
E. Love, Bristol	2,178	0	0
R. Wilkins & Sons, Bristol	2,135	0	0
E. Walters, Bristol	2,110	0	0
W. Veals, Bristol	2,103	0	0
G. Downs, Bristol	2,089	0	0
G. H. WILKINS, Bristol (accepted)	2,030	0	0

BANGOR.

For Constructing Concrete and Timber Wharf, Coal Store, &c., at Bangor, co. Down, for Messrs. Robert Neill & Sons. Messrs. RUSSELL & LOCKWOOD, Engineers, 6 Waring Street, Belfast.

Clark, Inverness	£10,468	0	0
H. & J. Martin, Limited, Belfast	7,651	0	0
Brebner, Edinburgh	7,025	11	0
Workman & Co., Belfast	6,954	10	0
M. Green, Belfast	6,900	13	0
W. J. Campbell & Son, Glasgow	6,600	0	0
G. Lawson & Son, Glasgow	6,308	5	9
Stitt, Belfast	6,137	9	0

* Accepted with certain reductions.

COVENTRY.

For Works to be Executed under the Private Street Works Act, Brook Street, Chapel Street, Colchester Street, Days Lane, Freehold Street, Lamb Street, Read Street and Spring Street.

Jones & Fitzmaurice	£2,125	0	0
C. G. Hill	1,926	8	0
Curral & Lewis	1,885	10	8
Robert Finnegan	1,860	0	0
G. Storer	1,810	0	0
T. H. Hall	1,712	0	0
Exors. of W. Bcon	1,542	19	1

GLASGOW.

For Building New Hospital at Ruchill, for the Glasgow Corporation.

Accepted Tenders.

W. Steven & Son, brickwork	£101,616	14	5
D. Buchanan, joiner work	26,635	6	0
Staffordshire Tileries, tiling work	9,709	19	9
J. M. Symington, plumber work	9,006	14	11
J. Cormack & Sons, heating work	7,794	19	4
W. S. M'Kenzie, plasterer work	4,892	4	7
H. Tosh & Sons, gasfitting work	2,141	5	6
Johnston & Sons, painting work	2,025	6	10

The contract for the slater work has not yet been decided, but it is expected to amount to nearly £6,000, which will bring up the total sum to £169,519 8s. 11d., but this does not include the laying out the grounds, the cost of the machinery, furnishings and other things.

"SPHINX" PORTLAND CEMENT.



112 lbs. per bushel. Slow setting; test 1,000 lbs. to 1 1/2 inch; seven days. Fineness, 2,500 meshes to square inch, with less than 10 per cent. residue. Over 10,000 tons supplied to Cardiff and Hereford Water Works.

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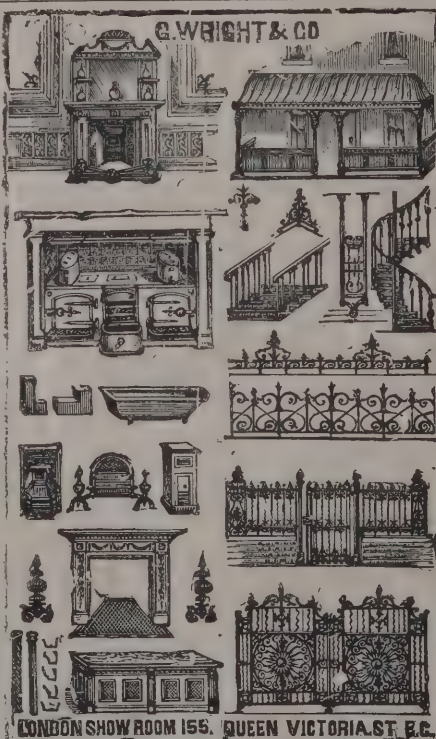
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LLANDEBIE.

For Building Pair of Cottages at Castellolynghill, for Mr. Benjamin Hughes. Mr. DAVID JENKINS, F.R.I.B.A., Architect, Llandilo.		
Lewis Davies	£492	8 11
Peter Evans	370	0 0
D. H. Jones	369	12 0
G. Vaughan	365	0 0
J. DAVIES, Swansea (accepted)	365	0 0
T. M. Hughes	360	0 0

LLANDILO.

For Alterations and Shop Fittings, for Messrs. W. & J. Thomas, Watchmakers and Jewellers, Church Street. Mr. DAVID JENKINS, F.R.I.B.A., Architect, Llandilo.

John Davies	£95	0 0
D. H. Jones	85	0 0
Daniel Evans	78	0 0
THOMAS BROS., Llandilo (accepted)	69	0 0

For Carpenters and Joiners' Work for Two Houses at Alan Road, for Mr. T. P. Williams, Monumental Mason, Rhosmaen Street. Mr. DAVID JENKINS, F.R.I.B.A., Architect, Llandilo.

THOMAS BROTHERS, Llandilo (accepted)	£125	0 0
Walling, per perch, 3s. 3d., ditto.		

LYNDHURST.

For Memorial Chapel and Priest's House at Lyndhurst, to be Erected for M. Edouard M. Souberbielle, from the Designs of Sir Arthur Blomfield, A.R.A., under the Superintendence of Mr. CLIFTON, Architect.

	Site and Chapel.	Priest's House.
Higgs & Hill, London	£5,564	£1,990
Leslie & Co.	5,375	1,925
H. I. Sanders, Southampton	5,387	1,958
Dove Bros., London	5,320	1,975
Lawrance & Sons, London	5,280	1,835
Mowlem & Co., London	5,105	1,890
Goddard & Sons, Farnham	4,465	1,753
Rashley, Lymington	4,385	1,585
Stewart	4,298	1,700

It has been decided that the Priest's House shall not be erected, but the Chapel only. The lowest tender for this portion, Mr. Stewart's, is accepted.

LONDON.

For Ventilation and Drainage Works at South-Eastern Hospital. Mr. ALDWINCKLE, Architect.

J. Mitchell & Co., Drury Lane, W.C.	£557	5 3
E. Mills, Westcombe Park	455	15 0
W. Akers & Co., South Norwood	455	0 0
T. Adams, Wood Green	419	0 0
J. Knight & Sons, Westminster	404	17 0
W. Mills, Westcombe Park	389	0 0
W. JOHNSON & Co. (accepted)	387	0 0
J. Jackson, Plaistow	325	0 0
Architect's estimate	390	0 0

PONTYPRIDD.

For Cast and Wrought Ironwork and Steelwork required in the Construction and Erection of Columns, Girders, Beams, Roofing, Covering of Tar Well, Retort Bench, Mountings, Set of Four Purifiers, Hydraulic Lifting Apparatus, Lime Elevator, Centre and other Valves and Connections; No. 8, Steam-engine and Gas Exhauster; No. 10, Tower Scrubber and Tar Extractor; No. 12, Station Meter and Station Governor.

Contract No. 4.

W. R. Renshaw & Co.	£8,117	1 3
Kyte & Co.	7,385	12 6
Thornton & Cribben.	7,153	4 1
Whessoe Foundry Company, Limited	6,999	0 0
T. Tattersall & Sons	6,970	0 0
E. Cockey & Sons, Limited	6,917	14 0
J. & S. Robert, Limited	6,874	0 0
C. & W. Walker	6,819	8 1
Barrowfield Iron Company, Limited	6,800	0 0
Ashmore, Benson, Pease & Co., Limited	6,773	10 0
Westwood & Wright	6,571	0 0
Clayton, Son & Co., Limited	6,400	0 0
Newton, Chambers & Co., Limited	6,373	0 0
Clapham Bros., Limited	6,363	16 0
R. & J. DEMPSTER, LIMITED (accepted)	6,295	0 0

Contract No. 12.

W. Parkinson & Co.	531	0 0
Gas-Meter Company, Limited, Oldham	531	0 0
J. Milne & Son, Limited	531	0 0
W. & R. Cowan	531	0 0
J. & J. BRADDOCK (accepted)	531	0 0
J. Coates & Co.	500	0 0

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PONTYPRIDD—continued.*Contract No. 8.*

Westwood & Wright	£300	0	0
Gwynne & Co.	230	0	0
E. Cockey & Sons, Limited	219	15	0
R. & J. Dempster	202	10	0
B. Donkin & Co., Limited	200	0	0
R. Laidlaw & Son	195	0	0
Blakely & Pickering	190	0	0
Whessoe Foundry Company, Limited	185	0	0
G. WALKER & Co. (accepted)	169	14	0

Contract No. 10.

Barrowfield Ironworks, Limited	680	0	0
E. Cockey & Sons, Limited	613	2	3
Thornton & Cribben	605	6	2
Newton, Chambers & Co., Limited	596	0	0
Clapham Bros., Limited	594	16	8
Whessoe Foundry Company, Limited	585	0	0
Westwood & Wright	580	0	0
C. & W. Walker	579	5	10
R. & J. DEMPSTER (accepted)	576	0	0
T. Tattersall & Sons	539	10	0
Ashmore, Benson & Co.	537	10	0

ROTHERHAM.

For Building Scholes Board School, for the Rotherham School Board. Mr. H. L. TACON, Architect, 11 Westgate, Rotherham. Quantities by the Architect.

Duncan & Jones, Barnsley	£1,625	0	0
W. Bell, Rotherham	1,530	0	0
R. Snell, Rotherham	1,338	0	0
J. Tradewell, Rawmarsh	1,280	0	0
R. SNELL, Masborough (accepted)	1,280	0	0

For Building Alma Road School, for the Rotherham School Board. Mr. H. L. TACON, Architect, 11 Westgate, Rotherham. Quantities by the Architect.

R. Snell, Rotherham	£6,699	0	0
R. Snell, Masborough	6,600	0	0
CHADWICK & CO., Masborough (accepted)	6,339	0	0

SKIBBEREEN.

For the Construction of a Reservoir, Filter-beds, River Diversion Pipes, Fountains, Hydrants, Valves, Pipe-laying, and all Works and Materials required for the Supply of Water to the Town of Skibbereen, and Caretaker's House, for the Guardians of Skibbereen Union. Mr. RICHARD W. WALSH, C.E., 10 South Frederick Street, Dublin.

Baird, Dublin	£6,425	0	0
T. J. Dixon, Dublin	6,300	0	0
White, Cappinquin, Cork	6,037	0	0
M. Walsh, Bansha Castle, Tipperary	5,875	0	0
Johnson, Cork	5,635	0	0
A. W. Smith, Bandon	5,600	0	0
J. O'Donohue, Cork	5,429	0	0
Hickson & Pert, Tralee	5,363	4	6
J. WHITE, Cork (accepted)	5,175	0	0

WELLINGTON.

For Enlargement and Additions to Hadley Schools, for the Wellington School Board. Mr. J. Knowles, Clerk. Mr. W. BALLOCK, Architect.

S. Turner, Hadley	£121	10	6
R. & J. Millington, Oakengates	118	0	0
J. Bright, Wellington	110	0	0
Lavender, Dawley	109	0	0
G. Ballock, Shrewsbury	104	0	0
A. Roper, Wellington	103	0	0
Tommy Bros., Wem	97	0	0

None accepted. Referred back for plans to be amended.

For Additions to National Schools, Wellington. Mr. W. BALLOCK, Architect.

H. W. Pointon, Wellington	£95	0	0
Tommy Bros., Wem	91	0	0
R. & J. Millington, Oakengates	90	0	0
G. Bullock, Shrewsbury	78	0	0
A. Roper, Wellington	68	0	0
J. BRIGHT (accepted)	65	0	0

For Additions to Sawley Schools.

G. Ballock, Shrewsbury	£23	15	0
Tommy Bros., Wem	19	0	0
A. Roper, Wellington	19	0	0

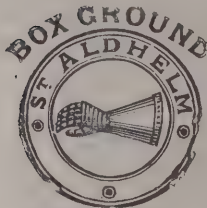
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WELLINGTON—continued.

For Additions to Wrekin Road Schools. Mr. W. BALLOCK, Architect.

R. & J. Millington, Oakengates	£230	0	0
G. Ballock, Shrewsbury	220	0	0
Lavender, Dawley	219	0	0
Tommy Bros., Wem	193	0	0
J. Bright, Wellington	170	0	0
A. ROPER, Wellington (accepted)	145	0	0

WEST LULWORTH.

For Building House at West Lulworth, Dorset, for Major Robson. Mr. F. R. BATES, Architect, Arlington Chambers, Newport.

C. E. Slade, Dorchester	£1,676	3	0
G. Runyard, Wool	1,433	18	4
G. Hobbs, Wareham	1,410	0	0
W. J. Chinchin, Bournemouth	1,300	0	0
A. Harvey, Charminster	1,175	16	0
J. Miller, Weymouth	1,147	0	0
D. Hutching, Parkstone *	1,105	0	0

* Accepted subject to some reductions.

TRADE NOTES.

WE have much pleasure in announcing that Messrs. Isaac Dixon & Co., of Liverpool, have just completed an iron hospital for the Wirral Joint Hospital committee at Clatterbridge, Cheshire.

THE new Board Schools, Aspatia, are being warmed and ventilated by means of Shorland's patent Manchester grates, inlet tubes, &c., the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

AT the meeting of the Glasgow Bridge Committee, the offer of Messrs. Morrison & Mason, Limited, to take down the existing bridge over the Clyde at Jamaica Street and to erect a new bridge of British granite for 81,175*l.* 5*s.* was definitely settled, and the work will now be proceeded with without delay.

THE Local Government Board have sanctioned a loan of between 11,000*l.* and 12,000*l.* for the purchase by the Belper Local Board of the undertaking of the Belper Waterworks Company, and the works are to be extended.

THE London postal address of Messrs. Joseph Robinson & Co., Limited, of London and Carlisle, plaster and cement manufacturers, is 206 Phoenix Street, St. Pancras, N.W. One of their special manufactures is Robinson's simplex fire and sound-proof partition blocks. We have before now explained the merits of this system for walls, &c., as a protection in case of fire and preventing the transmission of sound, as a very reliable system, economical, and effecting much saving in time and labour. Another merit is found in its application to metal-work.

STEEL-MAKING is to be restarted at Glengarnock Steel Works, Glasgow, and the necessary works for putting the plant in order are being carried out.

BUILDING AND BUILDERS.

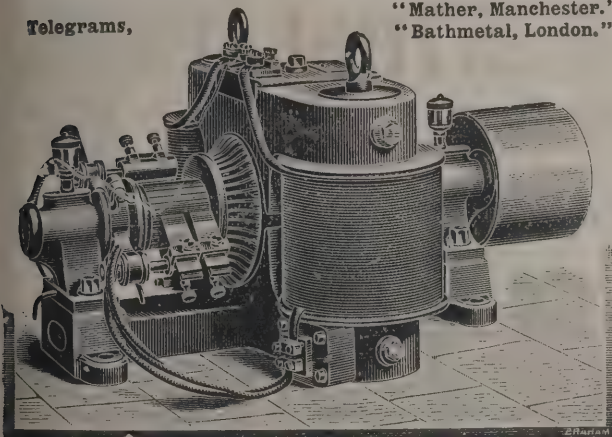
A TECHNICAL Institute is about to be erected in St. James's Road, Kingston-on-Thames, at a cost of about 4,000*l.*

AT the meeting of the Aston Board of Guardians the building committee reported that they had discussed the conditions, already approved by the Board, for the invitation of plans for the proposed Cottage Homes. They recommended that the conditions be permitted to stand, subject to the following alterations:—That the cottages to be erected should be four to accommodate 30 children each, six to accommodate 24 children each, and two to accommodate 16 children each; that the infirmary be made to accommodate 24 children (12 boys and 12 girls); that a general laundry be provided, and a washhouse to each of the girls' homes; that the entrance be in Fentham Road, and that the Guardians shall have the option of employing the successful competitor as their architect, or of awarding him the sum of 70*l.* for his plans, which should become the property of the Guardians. The report was adopted.

ALLUDING to the railway extension, the *Nottingham Guardian* says buildings in Nottingham are being taken down, including the old Town Hall and premises in Trent Street, on the Queen's Road, in Waterway Street, Kirke White Street, &c. The number of visitors to the dungeons beneath the old Town Hall has been very large, and great interest has been taken in the building and all it contained. Local and distant lovers of antiquities have purchased many souvenirs—all the dungeon doors have been sold, wax impres-

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sions of the crowd of initials and names carved upon the stone found in the debtors' cell have been taken, and a brisk business has been done in walking-sticks and other articles fashioned from the oak about the place. All the walls are now down, and very soon no trace of the historical spot will be left at Weekday Cross. A temporary wooden bridge crosses the Trent, though not on the line along which the viaduct will be constructed, and temporary rails are laid to Wilford.

At the annual meeting of the Manchester and Salford Builders' Association just held, it was reported that notices for revision of rules, shortening the hours of labour, increase in rate of wages per hour, &c., had been received from all the branches of labour in the building trades in the neighbourhood, and a committee was appointed to look into the various communications received and report thereon. Mr. Robert Neill, jun., of Manchester, was elected president of the Association for the ensuing year.

THE Albion Saw Mills at West Hartlepool have been destroyed by fire. Large quantities of manufactured timber were consumed, the damage being estimated at about 6,000*l*.

ELECTRICAL.

In distributing the prizes at the Crewe Mechanics' Institute on Friday last Lord Kelvin said that, in going through the Crewe works that day, he was much struck with the new electrical development which was taking place. He himself took an intense interest in electricity early in life, and he had never ceased to take an interest in it. He did not predict that it would come to pass immediately, but he thought it possible that steam locomotion might be superseded on their railways by electricity.

THE Worcestershire Council have confirmed a contract with Messrs. Verity for the supply of fittings, amounting to 91*l*. 3*s*. 11*d*., in connection with electric lighting of the Shire Hall. The question of confirming a contract with the New British Electric Installation Company, for 474*l*. 6*s*. 6*d*. for wiring the building, was allowed to stand over.

THE inhabitants of Adelaide have been polled to decide whether the city should be lighted by gas or electricity. The result of the polling was 3,382 votes in favour of gas and 2,255 for electricity.

At the meeting of the Coventry City Council a report was submitted by the electric-light committee:—In order to be in a position to let meters on hire to consumers your committee advertised for tenders for the supply of meters of various sizes, according to a specification prepared by Mr. Hammond, their consulting engineer. The following tenders were received, the price stated in each case being for the sixty meters which it is proposed to procure in the first instance:—Chamberlain & Hookham, Limited, Birmingham, 270*l*. 10*s*.; Westinghouse Electric Company, London, 295*l*. 17*s*. 9*d*.; Electric Construction Company, Limited, Wolverhampton, 299*l*. 4*s*.; General Electric Company, Limited, London, 336*l*. 7*s*. 6*d*.; British Thomson-Houston Company, Limited, London, 406*l*. 5*s*. 4*d*.; Charles A. Miller, Bradford, 462*l*.

THE Mayor of Tunbridge Wells is an amateur electrician of great experience and ability, and can show at Broomhall, his luxurious residence in that town, one of the most perfect electrical installations in the country.

To prevent underground electric explosions it is suggested that ventilation is only required to insure perfect immunity from such explosions, and that further to obviate the trouble of opening traps it will be sufficient to have the trap-doors perforated.

THE special lighting committee of the Liverpool Corporation have decided to recommend the Council to consider, and if thought expedient to approve of the intention to apply to the Board of Trade for a license to supply the city with electricity for public and private purposes.

VARIETIES.

AN inquiry has been held by the Local Government Board as to an application from the Macclesfield Town Council for a loan of 60,000*l*. for sewerage and sewage disposal. Mr. W. H. Radford, of Nottingham, is the engineer.

At the ordinary meeting of the Civil and Mechanical Engineers' Society, on Thursday, January 17, a paper was read by Mr. A. Hanssen, C.E., on "Checking Engineering Calculations." In it he dealt with the necessity of systematically carrying out the work and the advantages of using mechanical aids, more particularly alluding to the slide rule, calculating machines and various forms of planimeters. A discussion ensued, and after the usual vote of thanks to the author the meeting was adjourned.

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AT the meeting of the markets and fairs committee, it was announced that the Local Government Board had given the Birmingham Corporation power to borrow the additional 5,000*l.* required for the new meat market, without any further inquiry by the Board.

A VOLUNTEER fire brigade has been organised for Toxteth Park Township, Liverpool, by Mr. John Price, the district engineer. The engine supplied by Messrs. Merryweather & Sons is of light "County Council" pattern, capable of delivering 200 gallons of water per minute and of throwing a single jet to a height of 140 feet, or as many as four jets may be used simultaneously. The boiler is Merryweathers' patent quick steam raising type, fitted with curved and inclined tubes, and an annular water casing surrounding fire-box. Steam can be raised from cold water in four minutes, and to full working pressure in from six to eight minutes from time of lighting the fire.

THE Melbourne Builders and Contractors' Association have appointed a committee to consider the condition of the Exchange, which has ceased to pay, and is used by many men who never pay one farthing towards the expenses of conducting it. There are other exchanges which are not profitable concerns.

ANTHYDOR PAINTS.

WE are pleased to hear that what is known as the "Anthydor" compound has found so much favour as an excellent substitute for oil paints and distemper. For inside or outside use it can be had washable or not, as ordered. Among other advantages it possesses, it may be stated that it does not become discoloured as some compounds do, owing to changes resulting from the admixture of chemical agents. In many cases, especially in outside work, the washable Anthydor is most useful as proof against weather and elements. In another form the compound can be removed without much difficulty if required. The company also claim that, manufactured by a new process and of the best materials, it has proved a success in beauty, colour, covering properties and durability; also that these compounds are absolutely lime-resisting, easily applied on any paper, inside and outside walls of all kinds, woodwork, iron, &c., that it requires nothing added but tepid water to thin it down to the consistency of cream, and can be applied with either distemper or paint brushes, which it will not injure. It works like paint, and woodwork requires no special preparation

beforehand. It is cheaper than wall-papers, dries smooth and bright, keeps its colour, and is most effective for high-class decorative work. The address of the company is 47 Victoria Street, S.W., Mr. Waller, secretary and manager.

A NON-POLARISING BATTERY.

A DISCOVERY of great importance connected with the production and utilisation of electricity has recently been effected in Birmingham, and is exciting much interest and discussion amongst electricians and other scientists. For many years—in fact, ever since electricity has become one of the applied sciences—the problem which has most occupied the thoughts of electricians has been how to produce a primary voltaic cell which will give a continuous current of electricity without polarisation. This much-desired object, says the *Daily Post*, we understand has at length been accomplished by two Birmingham electricians, Messrs. William Walker and Frank Wilkins, who after several years of research and experiment have succeeded in producing a non-polarising voltaic battery, consisting of one or more simple primary cells or chemical generators of electricity. The unique feature of this invention is that by an ingenious use of the atmosphere the electric current in the cell is kept perfectly steady, the action of the hydrogen on the negative element or carbon being neutralised by the oxygen, and polarisation consequently prevented. Hitherto, in order to maintain the pressure, costly chemicals had been used, which made the cost of the electric current produced far too expensive for practical or general use, and at the same time the current has not been trustworthy for more than a few hours together. It has been demonstrated that by the use of the new patent voltaic battery no less than 97 per cent. of the zinc used is given back in electricity, compared with only about 40 per cent. under the ordinary processes, whilst the pressure of the electric current is maintained throughout until its complete exhaustion, when it can be easily replenished. The voltaic cell is composed of an amalgamated split cylinder of zinc, immersed in a solution of caustic potash, contained in a porous pot placed concentrically within a larger perforated outer vessel. The space between these vessels is packed with carbon, the carbon in contact with the porous pot being powdered, while that next the outer vessel is granular. The current is collected by means of a perforated metal cylinder embedded in the granular carbon. The advantages claimed

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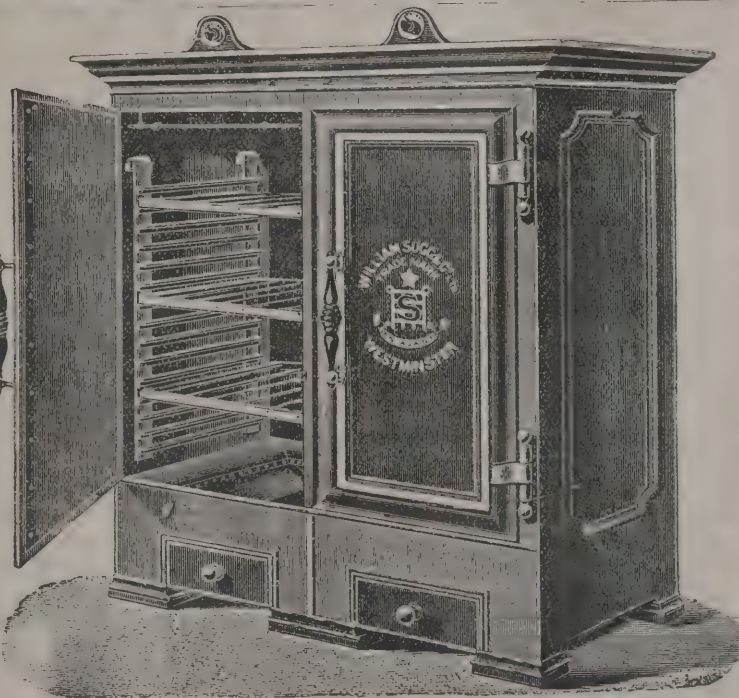
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for the cell are freedom from offensive or obnoxious fumes when working, the simplicity of the cell and of the charging solution, and the almost entire absence of local action and unnecessary waste of zinc. The uses to which this invention can be applied are innumerable, and it will probably not only revolutionise the present system of domestic lighting by gas, but also become a valuable motive power in connection with many of the light mechanical and fancy industries throughout the world. In addition it will be found of the greatest utility in the lighting of country railway stations, railway carriages, signals, telegraphy, mining lamps and mining purposes. As a motor it will be especially welcomed by users of power, from the smallest possible work, such as a dentist's drill, up to 2 or 3 horse-power, and it will, therefore, be available for small manufacturers in the jewellery, electro-plate, leather and other fancy trades, who are unable through want of means or space to put down steam or gas-engines and the necessary electrical apparatus, and who have consequently to hire the use of machinery at other establishments. It is anticipated, therefore, that the new motor will practically transform the lighter trades of Birmingham, Sheffield and other towns both at home and abroad. The invention can also be used economically and successfully in the printing and bookbinding trades, in the boot, woollen, silk and cycle industries, and particularly for driving fans for ventilating unhealthy workshops, basements of hotels, the lighting and ventilating of ships, and for driving propellers of pleasure-boats. The invention will also be found exceedingly useful for domestic purposes, such as the driving of sewing machines, enabling many comforts to be provided hitherto unattainable by the general public, as it will be a generator of power without offensive odour, noise, or the employment of expensive machinery and labour, with an entire absence of wear and tear and waste of material when not at work. It is not intended that the new electric generator shall be brought into direct competition with gas-lighting in towns and districts where public lighting is effectively carried out; but it will enable the dweller in country districts where no such supply is available to provide his own electric illumination at a comparatively small expense, as this system dispenses with the necessity of the costly machinery necessary to work the dynamo. It is anticipated, however, that this method of lighting will be found to be infinitely preferable to gas from the point of view of ventilation, and that it will eventually be adopted by many householders, both large and small, on general sanitary considerations. At present the cost of laying

down an electrical installation is so expensive that it can only be effected with advantage by the owners of large establishments, whereas the new system can be brought within the reach of all, the arrangement for utilising the light being of the simplest possible character. Hitherto separate and private installations of the electric light have only been provided by putting down a steam-engine with dynamo and accumulators, whilst with the Walker-Wilkins patent the installations can be supplied for the mere cost of the accumulators. Users of these voltaic batteries will further derive a great advantage in the sense of economical consumption by having the manufacturing and consuming apparatus under their own personal control.

In the early stages of the discovery, the inventors consulted Mr. Jabez Lones, of the firm of Messrs. Lones, Vernon & Holden, of the Sandwell Iron and Axle Works, Smethwick, as to the best methods of utilising the invention for commercial purposes, and that gentleman, after consultation with a leading local patent agent, was convinced that the invention was both novel and new to the electrical world. Thereupon an influential syndicate was formed taking over the cost of patents, preliminary experiments, and the obtaining of the scientific opinion of eminent electrical experts. Professor Jamieson, M.I.C.E., F.R.S.E., of Glasgow, one of the highest electrical authorities in the country, has made an exhaustive investigation and analysis of the patent, and states that this "non-polarising cell is the best of its kind I have ever tested;" and expresses the belief that "it will prove very serviceable for driving electric motors, for electric lighting, and for the electro deposition of metals where engines and dynamos are not available." In his report Professor Jamieson gives the results of a number of potential current tests, showing the efficiency of the voltaic cells as generators of electrical energy, and further reports that he considers them "symmetrical in form, substantial in every detail, and thoroughly well made." Patents have been secured for the United Kingdom, and the invention has also been patented on the Continent of Europe, in the United States of America, and most of the civilised countries of the world. It is the intention of the syndicate, in the first place, to offer the sale of their patents to corporations and local authorities who are manufacturers of gas and to gas companies, enabling them to undertake domestic lighting. For the multitudinous purposes for which the invention can be used as a motor it is proposed to offer the manufacture, sale and use to local electrical companies supplying electric motors in our cities and towns.

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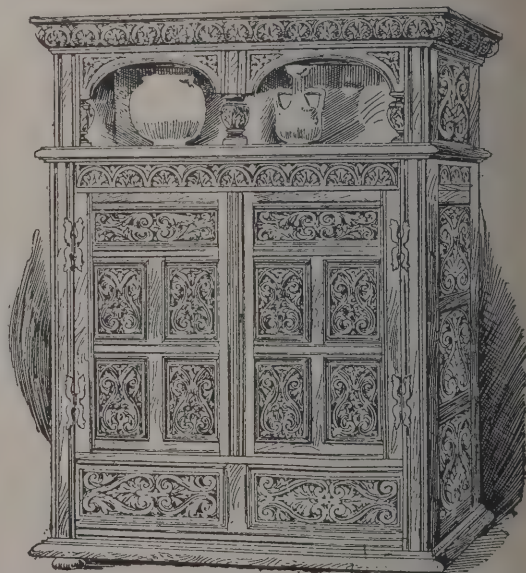
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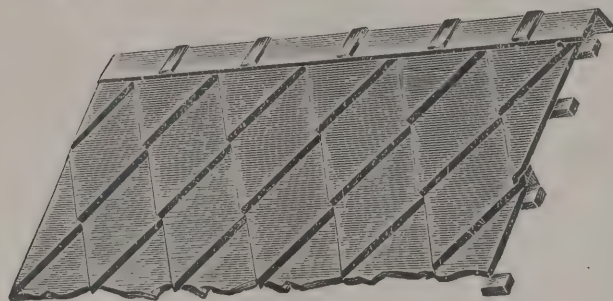
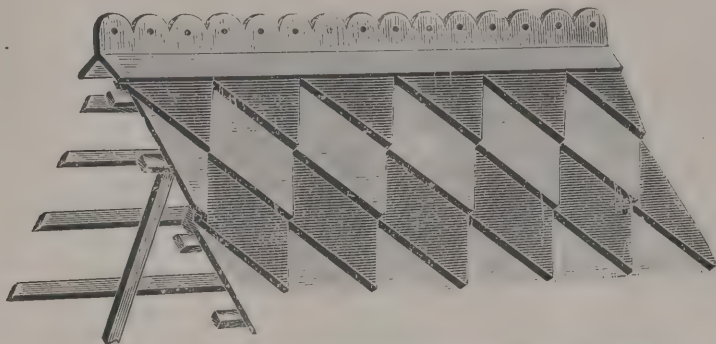
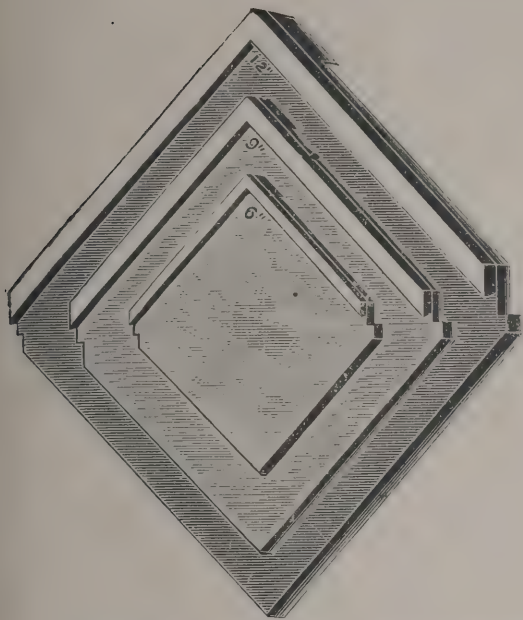


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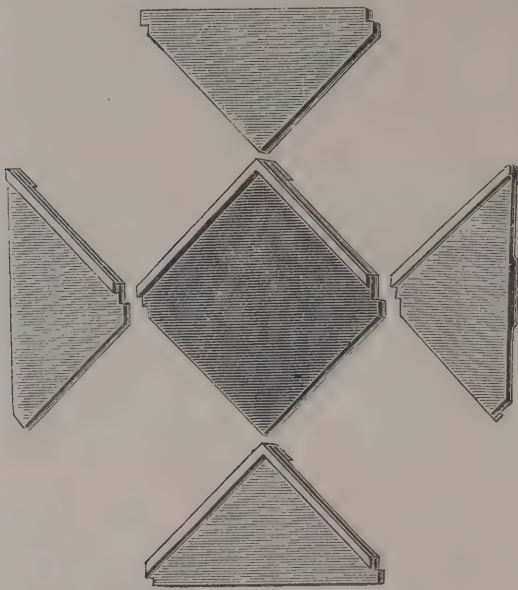
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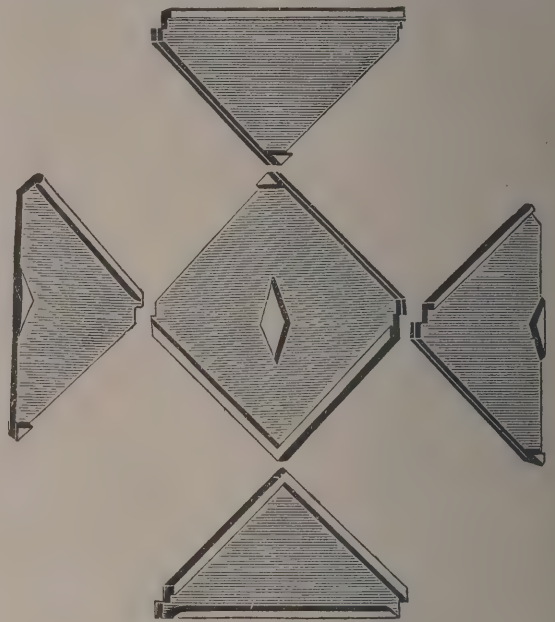
regard to this system of roof, we need only refer to its capability as to artistic effect and say that the materials employed, combined with the method of manufacture, produce the most durable of roof-tiling. Independently of the above-mentioned features, the tiles carry in themselves constructive details that secure a solid fixing without extra assistance of any

are practically imperishable, and they better with age and weathering. Another recommendation is that any single tile can be removed at any time and replaced without disturbing those beside it.

The tiles can be manufactured anywhere, and the company propose, instead of erecting large works in London, to make



FRONT VIEW OF WHOLE TILE.



REVERSE VIEW OF WHOLE TILE.

kind, whether nails, pegs, &c., and also require no boarding to support them. The roof thus formed may be said to be as solid as rock. It is at the same time very light, and it seems absolutely impossible that in the most exposed situations rain, snow, sand, or wind can penetrate. This may be expected on examining what we have called the constructive features of the tiles. At the same time, under ordinary conditions of calm weather there is circulation of air, which is another welcome advantage. Owing to the nature of the materials used the tiles

are practically imperishable, and they better with age and weathering. Another recommendation is that any single tile can be removed at any time and replaced without disturbing those beside it.

The tiles were recently put under a severe test by a well-known architect, who was so pleased with the result that he specified them at once for an important building which will shortly be commenced.

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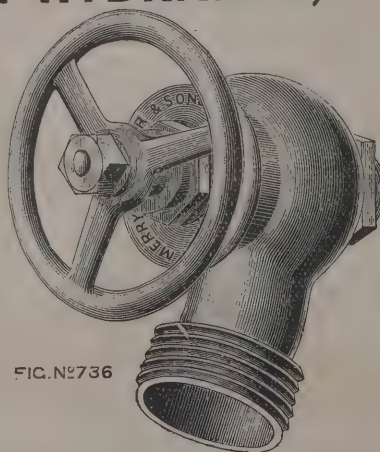
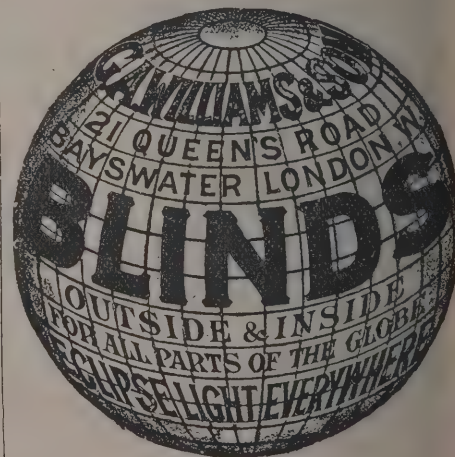


FIG. N°736



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TECHNICAL EDUCATION.

AT the first annual general meeting of the Association of Technical Institutions Mr. W. Mather, M.P., was elected president for the ensuing year.

The President, in his address, said he understood the object of the Association to be to afford the means of intercommunication between those who were responsible for the organisation and management of technical schools and colleges, by which opportunities might be provided by the friendly interchange of ideas between persons engaged in similar work in different parts of the country. He was one of a considerable number of employers engaged in conducting some of the great industries of this country, who had foreseen a great national danger in our general indifference to the absence of systematic scientific instruction in the industrial training of young people, and who had during the last fifteen years or more tried to promote schools of industrial science as a basis for their manufactures, arts and commerce in the future. The local authorities of England and Wales received about 780,000*l.* per annum from the duty on whisky and beer. They allotted in 1893-94 654,000*l.* to educational purposes. Of this 73,000*l.* was last year applied by 37 councils to agricultural education. The returns of 1894-95 showed that out of a total of 110 counties and county boroughs in England 96 were giving the whole and 13 part of their grants to educational purposes. In London, though only tardy progress had been made, probably the whole of the grant would be bestowed very shortly—namely, 171,000*l.*—for educational purposes. There would probably remain only about 30,000*l.* of the total sum of 780,000*l.* devoted to the relief of local rates after this year, and the few local authorities who used the money for this purpose would, it was to be hoped, follow the lead of the country generally before long and devote it to technical education. The provisions of the Technical Instruction Acts were being utilised by at least 138 local authorities who had levied part of their permissive penny rate to maintain schools and in some cases to raise loans to build technical schools. Upwards of 200 technical schools are now at work in Great Britain. So far as the pecuniary facilities conferred by the Acts were concerned, the position might be stated as follows:—They had in grants and optional rates the means of annually bestowing on technical education in England and Wales (1) from grants under the Local Taxation Act about 780,000*l.*; (2) from the local penny rate in England and Wales to be derived from county

boroughs, other boroughs and local boards, but exclusive of rural sanitary authorities to which the Technical Instruction Act did not apply, about 271,000*l.* This last mentioned sum was equal to a capital sum of about 5,500,000*l.*, repayable over forty years. But under the District and Parish Councils Act the rural sanitary authority had vanished and the penny rate might be levied by the new bodies which covered the whole country. A penny rate levied now would yield on the total rateable value of the whole country, which was 160,000,000*l.*, a sum of 664,500*l.* per annum; and supposing the rate to be made compulsory under a great scheme of secondary education, a capital sum of about 14,000,000*l.* could be raised, repayable by the rate in forty years. A third source of revenue for technical education came from the grants of the Science and Art Department for science and art classes, and amounted to about 355,000*l.* Adding this to the two former, they got a total of about 1,406,000*l.*; or if they took in the whole country, including the rural districts, the total would be about 1,800,000*l.* To these sums there was further to be added the voluntary aid to technical institutions, happily growing, in which they had to include some of the highest colleges. This movement now urgently demanded guidance, consolidation and organisation to maintain its permanent strength and continuity. The blending of brain, hand and eye in all the work of the primary school was the chief want to-day in our public school method of teaching.

IMPROVED METHODS OF HOUSE-DRAINAGE IN AMERICA.*

YOUR committee has honoured me with an invitation to prepare a paper for this meeting, and has left me entirely free to select some topic from the wide and constantly growing field of sanitary engineering. The sanitation of houses, school hygiene, hospital construction, rain-baths, domestic gas-lighting, the sanitary features of the laying out of cities, water-supply, fire-prevention and fire-extinction, the safety in theatres and halls of amusement—these were some of the numerous subjects which occurred to me as being of interest to the members of the Architectural League.

* A paper read at the monthly meeting (December 5, 1894) of the Architectural League, by Wm. Paul Gerhard, C.E., consulting engineer for sanitary works.

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After thinking the matter over for some time I concluded that it would be better to select a subject in which I have been most actively engaged in the past years. Accordingly I decided to speak to you on "Improved Methods of House-Drainage," although I was well aware of the fact that I could not attempt to treat the matter from any novel point of view. For while the subject is of paramount importance and one in which every architect takes an interest, it has been quite frequently discussed, and there are numerous books, pamphlets, essays and lectures which go into the matter very fully.

I can, therefore, assure you that it is with the utmost diffidence that I come before you to-night to give a brief address on what many of you will doubtless consider a dry and uninteresting subject.

My endeavour will be to explain some important improvements which have been brought about in the past ten years in the art of draining houses.

To begin with, one quite noticeable improvement relates to drainage plans. Until a comparatively recent period of time, it was an exception to find elaborate plans and sections of the plumbing and drainage system of buildings. The location of the plumbing fixtures was, to be sure, indicated on the floor plans of the building. Beyond this, very little information was given. It was not usual to mark the number and sizes of soil-pipe stacks, neither was the run and course of the drains indicated on the plans. I believe I am not mistaken in stating that in architects' offices the practice of making a special drainage plan began with the enactment of the plumbing laws. At least, I remember distinctly that, when as chief engineer of a house-drainage company it was my privilege, about ten years ago, to estimate in some of the prominent architectural offices in this and in other cities, I was given plans to estimate on where the drains and soil-pipes were neither shown, nor enumerated or described in the specifications. All this has undergone a great change in the past few years.

Owners of buildings are much benefited by the plumbing laws which require plumbing plans to be filed in the City Health or Building Departments. Even where in the actual construction of the work the drainage plan is, more or less, modified, there is kept on record a usually tolerably accurate plan, showing the position of pipes, in case of future reference. In important cases a revised drainage plan is subsequently made, showing the work as actually put in. The contractors are benefited by it, because they know better on what work and what quantities to base their estimate. Their workmen on the

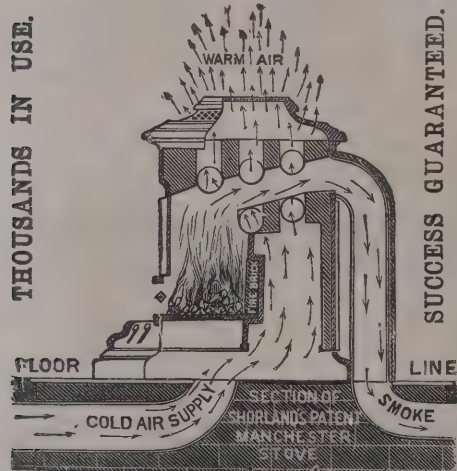
building are likewise benefited, because they can find by referring to the plans where the pipes are intended to be run. The architects and the building superintendents are benefited because they do not have to answer so many questions to the foreman in charge of the plumbing and drainage, and because their time is not so much taken up at the buildings in course of construction with the laying out of the sometimes complicated work. The many advantages, resulting from well-considered drainage plans, become particularly apparent in the case of large and important structures, such as hotels, hospitals and modern office buildings.

Another improvement relates to plumbing and drainage specifications. While formerly plumbing specifications were somewhat indefinite and too general in character, with the inevitable result that estimates for the work ran widely apart, it is now universally recognised that plumbing is a question of vital importance in building construction, and much more care is exhibited in the preparation of the specification. Other things being equal, it is self-evident that the more thoroughly detailed and accurate the specifications are—which does not necessarily mean elaborate—the closer will the bids for the work run, and the more will the finished work conform to the expectations of the architect or his client. In this connection, permit me to state that the too general use of the printed blank plumbing specifications of the Building Department for contract work is not, in my judgment, to be approved. Such blank forms may be exceedingly convenient and labour-saving for the inspectors of the Department, but for all, except the smallest houses or tenement buildings or simple warehouses, they are not sufficiently detailed. A contract for a large job should be based on a separate type-written or printed specification. Too much care cannot be bestowed upon the specification. It is my experience, and doubtless it is yours, that the number of extras in the final plumbing bills is inversely in proportion to the completeness of the specification. I refer here, of course, only to the extras which the architect finds himself compelled to order, owing to omissions in the original specifications, and I do not include those sometimes quite numerous extras which owners or building committees require.

Now let me turn to the question of materials. Here, too, we cannot fail to find numerous and important improvements. Formerly the house-drain inside the building consisted of earthenware pipes. The soil-pipes were run of lead pipe, with

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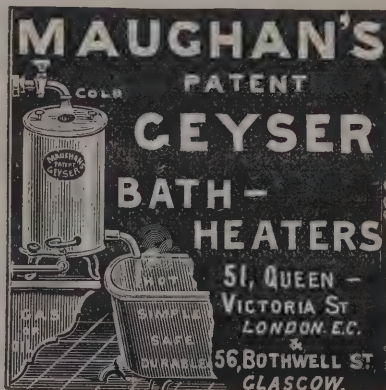
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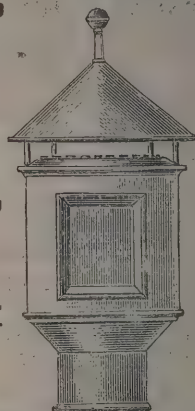
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hand-made seams. You are, I trust, sufficiently aware of the objections to such materials. Happily they have gone out of use. The first improvement consisted in using iron pipes for drains and soil-pipes. For many years it was customary to use the so-called light or standard plumber's soil-pipe. When the testing of drains by the water-test began, the objections to these pipes at once became apparent, it being a most difficult matter to caulk joints in light pipes so as to be permanently air and water-tight. Hence it came about that at least in the case of the better class of buildings, extra heavy cast-iron pipes were specified. From this time dates the curious practice, which I have often met, of specifying heavy pipe for the main drain and light pipe for the vertical soil and waste-pipe lines. Still later, when the practice of "back-airing" traps began, we find heavy pipes specified for both the drain and the soil-pipe system, whereas light pipes were considered sufficiently good for vertical lines of vent-pipes. A chain is not stronger than its weakest link, and I know you will agree with me that it was a mistake to use two grades of pipe for the soil, drain and vent-pipe system of a building. As is well known, the use of extra heavy pipes is now in this city compulsory in all classes of buildings, from the cheapest tenement-house to the finest private mansion. It is perhaps well that the rule is compulsory, for otherwise we should find unscrupulous plumbing contractors and speculative builders still making use of what they must know is an unsatisfactory material for drainage. Castiron pipe, even of the heaviest and best quality, is apt to have sandholes or imperfect seams, hence by far the greatest security lies in ordering from the manufacturers pipes and fittings which have been tested at the foundry by hydrostatic pressure.

The most recent improvement, as regards this point, consists in the more extensive application of screw-jointed wrought-iron pipe for drainage purposes, particularly in the case of high buildings. Having been to some extent personally connected with the introduction of this system in the Eastern States, I cannot help remarking that a wonderful change in opinion has taken place in architects' offices, and to a certain extent also in plumbers' shops, regarding the merits of wrought-iron pipe and the use of screw-joints in place of lead-caulked joints for purposes of drainage. It is scarcely ten years ago when it was my privilege as engineer of a now defunct house-drainage company to discuss with architects the advantages incident to the new method of drainage. A few architects went on record as in favour of the screw-joint construction. The majority, how-

ever, guided in many cases by the advice of the plumbers estimating in their offices, were opposed to the use of wrought-iron for drain, soil and vent-pipes. The pipes which were used then by the advocates of the screw-jointed wrought-iron system were without exception protected against rust, either by a thorough application of coal-tar, or by dipping the pipes while heated into a bath of hot asphalt, or else the pipes and fittings were made rustless by the Bower-Barff process, or finally galvanised pipes were used, particularly for vent lines. You will readily understand my surprise to find at the present time buildings in which plain wrought-iron pipes are used for purposes of house-drainage, the pipes not being in any way protected against corrosion. The mistake—for mistake it is—can be explained only by the fact that the Building Department requires cast-iron pipe to be plain and uncoated, but wrought-iron piping should in my judgment always have some protecting coating against rust.

Other improvements relating to materials consist in the more extensive use of drawn-lead traps and of brass traps, in place of cast-lead pipes or of lead traps with hand-made seams. I must, however, sound a note of warning against the use of certain brass traps with cast partitions, which are often found to have sandholes, and are then of course only a delusion and afford no protection against sewer-air. The use of very light brass tubing for exposed or vent pipes should be guarded against, as also the use of light brass traps or of traps with rough inside surfaces. Finally, the brass pipe should be of iron-pipe size, i.e. full bore and not restricted in diameter.

I pass on now to the consideration of important recent improvements regarding the sizes of pipes used for drainage purposes and the manner of laying the drains. Of the old brick drains of large size, square in shape and ill-adapted to the removal of household wastes, it is not necessary for me to speak, as they belong to a former generation, although they are occasionally, even now, unearthed in the overhauling of older mansions. Up to within a recent period it was the custom to use for house-drains round pipes which were much too large in diameter to perform their function in a proper manner. Even the smallest house had a 6-inch drain; larger buildings had 9, 10 and even 12-inch pipes. There is no advantage, and there are considerable disadvantages, in using pipes of too large bore. The old-fashioned absurd ideas regarding the necessity for large pipes are now abandoned. The use of small drains is a distinctive achievement of modern sanitary drainage. It is usual, at present, to use a 4-inch pipe

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for the smaller houses. An average sized four-storey dwelling can be sufficiently sewered by a 5-inch drain, and a 6-inch sewer is sufficiently large for a mansion. Extensive buildings, such as institutions, office buildings, &c., may require a pipe of larger discharging capacity; but in that event it is preferred to use two or more drains of restricted size as being more liable to be self-cleansing.

To illustrate. The entire waste water from the plumbing fixtures in such an extensive building (vertically) as the Manhattan Life Insurance Company's building, comprising 205 washbasins, 24 sinks, 52 urinals, 62 waterclosets, and including all the roof-water, besides various other wastes, is successfully removed by means of two 6-inch pipe-sewers laid with a fall of $\frac{1}{4}$ -inch to the foot.

The same principle applies to the soil and waste-pipes of houses. Formerly 5 and 6-inch soil-pipes were commonly used in private houses, and the sink waste-pipe was at least 3, and often 4 inches in diameter. It is now the rule to make soil-pipes of private dwellings 4 inches, and kitchen-sink wastes are purposely restricted in size to 2 inches, in order to be more self-cleansing. As regards the branch wastes from fixtures, the modern tendency is to use small pipes, and not only a vast improvement but also economy in design is thereby effected. The traps under fixtures are likewise restricted, with the advantage that they are kept better flushed. It is under any circumstances a difficult matter to keep traps perfectly clean, but better results are undoubtedly attained where the diameter of traps is restricted, in order to concentrate the stream, and thus utilise the same in scouring the channel.

One other point in connection with sizes of waste-pipes is worth mentioning: I refer to the rain-water or conductor pipes. The sizes of these pipes—in fact, of all vertical pipes—cannot be determined by mathematical rules. Whereas sizes of horizontal or graded pipes can be calculated accurately by means of hydraulic formulas, or by tables evolved from these, I know of no rule by which to determine the diameters of leader-pipes for roofs of given areas and of known pitch. I have likewise been unable to find rules derived from practical experience or from actual tests and experiments, although I have hunted high and low for them. The only rule which I was able to find was in a recent German architectural text-book, according to which publication the diameter of a leader-pipe may be determined by allowing an area of 1 square inch in the pipe for each 60 to 70 square feet of roof-surface. I presume the smaller size is intended for roofs of a flat pitch,

and the larger size for steep roofs. It is not stated for what rate of rainfall the rule is applicable. Speaking generally, heavy rainfalls are much more frequent in our climate than in Germany, so that I should advise increasing, where this rule is followed, the diameter obtained, somewhat, to provide for efficient roof-drainage in case of very heavy sudden showers. This question of determining the size of conductor pipes is one that constantly occurs to architects and sanitary engineers, and it is to be hoped that experiments may be undertaken tending to the solution of the problem from a practical point of view.

This brings me to another question, viz. the manner of laying drains. Whereas formerly drains were buried in the ground, and thus became entirely inaccessible, it is now much preferred to carry the main drain of a house in plain sight above the cellar-floor, either suspended from the ceiling, or fastened along the cellar wall. Until quite recently it was the rule, where the drain was unavoidably laid beneath the cellar floor, in order to drain fixtures on this level, to place the drain in a trench formed of brick walls with a concrete bottom, and covered with an iron cover. The drain was thus kept accessible in its entire length. A few architects and some engineers still favour this method of construction. In my judgment, it is more preferable, after the underground drains have been thoroughly tested and made watertight, to bed the same in concrete, and to rely for access upon a number of suitably placed and suitably arranged cleaning handholes, made accessible by brick manholes with iron covers. Underground trenches, as usually built, are too liable to become rat runs, to accumulate dampness and dirt, and to constitute harbouring places for vermin. Such inspection and cleaning handholes are very desirable in a drainage system, and they should be abundantly provided even where the pipe is carried above the floor, in order to avoid the cutting of pipes, a habit only too common with thoughtless mechanics in case of a stoppage in the pipes.

Let us now give brief consideration to a further point, in which house-drainage has been greatly improved. Some years ago plans for the drainage of houses were submitted to me, in which the water-closet pipes or soil-pipes were kept separate and distinct from bath, lavatory and sink wastes. This double system, as you will readily comprehend, rendered the drainage system much more complicated and vastly more expensive without any corresponding advantage. This mistake, doubtless, arose from following too closely the prevailing

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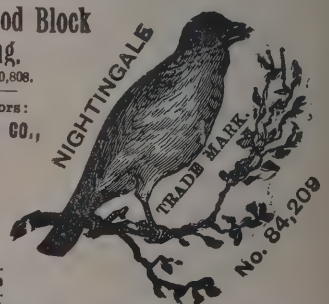
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English practice as described in the English text-books on plumbing. In the absence of any practical American books on house drainage and plumbing, architects had to rely largely, ten and more years ago, on the study of English works on drainage. It is not necessary nor even desirable to do this nowadays, as there are available several good books on the subjects by American authors, which clearly describe the American practice. Other features of the English practice of draining houses which are equally inapplicable here on account of differences in the climatic conditions, are the placing of the soil-pipes on the outside of the house and the running of the smaller wastes, such as bath and basin wastes over outside gullies.

A further curious mistake which I have encountered in plumbing plans is the requirement that in case of bath-rooms with water-closets located vertically over each other on succeeding floors, there should be a separate line of soil-pipe for the bath-room of each floor, thus entailing a needless complication, a multiplication of soil-pipe stacks and a greatly increased cost of the plumbing. The exactly opposite principles are followed to-day: the work is simplified as much as possible; plumbing fixtures in houses, planned by architects, are grouped together, and the drainage is concentrated as far as practicable in a single line of pipe, thus securing an abundantly flushed line, and economy in construction.

Not very long ago the pipes pertaining to the drainage system of a house were universally put out of sight, and the fixtures concealed by expensive but useless cabinet-work. Drains were placed under the cellar floor and rendered inaccessible, soil-pipes were built into the walls, waste and vent pipes bedded in plastered partitions, supply pipes were run under hard wood or tiled floors. In case of accident to any of the pipes nobody knew where to look for them, floors were torn open, the plastering cut, rich wall decorations destroyed in the efforts to reach the pipes. One of the chief features of modern work is the exposure of all pipes. Architects and owners have now become accustomed to this improvement; there are many who even fancy the new arrangement. By a clever study of the house plans it is often feasible to carry pipes exposed, *i.e.*, outside of walls or partitions, even on the parlour floor. I have found on this floor the main pipe lines kept accessible by a hard wood hinged pipe casing, in some houses built by our most prominent architects. What a great contrast with the builders' method of the past of boxing everything up, pipes, fixtures and all.

(To be concluded.)

THE WATT ANNIVERSARY.

THE Watt anniversary lecture, under the auspices of the Greenock Philosophical Society, was delivered on the 18th inst. by Dr. Francis Elgar in the Watt Museum Hall.

Dr. Elgar said he esteemed very highly the honour conferred on him by the invitation to lecture in Greenock on the anniversary of the birth of James Watt. Many men of the highest attainments and greatest distinction, he was aware, had occupied the position he occupied that night, and if he followed those great philosophers and illustrious engineers without the consciousness of presumption, it was only because he felt that none respected or admired more than he did the genius of the man whose memory they honoured. On an occasion like that, which was essentially commemorative and contemplative, he thought the better method would be to recall something of the vast extent and importance of the improvements due to Watt's inventions, in a field whence Greenock derived much of its fame and prosperity. He could not, of course, tell them anything new or strange, but they could with considerable profit reflect on what James Watt was, on what he did towards the creation and development of the most potent factor in modern progress, and on the manner in which his efforts had inspired others to pursue the same path of invention. Popularly a great inventor was supposed to be one who by a single brilliant stroke or series of brilliant strokes acquired fame or fortune. In some instances that might be true, but in the case of most great and valuable mechanical inventions it was not. James Watt toiled and suffered for more than twenty years after his discovery of separate condensation in 1765 before it was evident that his steam engine could ever bring anything but disappointment, financial loss and misery. "Of all things in life," he complained, "there is nothing more foolish than inventing." From 1765 to 1785—ten years before he joined Matthew Boulton and ten years afterwards—his great invention brought him nothing but sickness of heart and misery, and only in 1787 did the weary term of waiting end, and Watt, free from debt and anxiety, cease from cursing his invention and enter on peace and prosperity. Although, rather unfortunately perhaps, Watt never seriously devoted any time to the subject of steam navigation, he was in reality the originator of the marine engine, for he discovered and provided the means by which steam could be applied with advantage to the propulsion of ships. Each of his great improvements on the old engine that worked by atmospheric pressure and condensed its steam in the

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cylinder was a direct adaptation to marine purposes—the separate condenser, the double action of the steam in the cylinder on both sides of the piston working the steam expansively, the centrifugal governor for automatically regulating the speed of the engine and many others. These improvements made the rudely constructed little steamers of which the *Comet* was the first possible, and the tendency had been continuously towards greater dimensions, power, speed and endurance ever since. The employment of steam power in the manufacture of machinery and in the construction and propulsion of ships had made travelling by sea swift and sure and independent of the fickle aid of the wind. It had removed the hardships of seafaring by assimilating the conditions of existence afloat to those which obtained ashore, for a passenger steamer of the better class was now a floating hotel, in which hundreds of persons lived often for weeks together as luxuriously comfortable as they could on land. The great liners now arrived at and left their terminal ports with the regularity of railway trains, and sped across the great ocean highways at rates of from 21 to 22 knots, which, taking into account that the voyages were 3,500 statute miles, compared very favourably with ordinary railway running over very long distances. One of the broadest distinctions between the ships of the past, that were built of wood and propelled by wind, and those of the present, that were built of steel and propelled by steam, was that the one was the result of manual labour and the other of the application of steam power. At the close of the first third of this century the over-sea trade of the world was carried on with ships that were all of wood, and propelled by wind. Only about 200 of the total number were over 500 tons burden, or much more than 100 feet long. They were fashioned entirely by manual power, with the aid of very simple tools, and afloat were propelled by either oars or sails that could be easily worked by the crew. The builders had no machine tools or other labour-saving and labour-helping appliances to aid them in the preparation of material and in the building of the ship. Modern ships, which the Clyde turned out in large numbers, were very differently fashioned; practically everything was done by steam power variously applied. By steam power the plates which formed the hull were rolled and cut, drilled, bent to form, and in many cases rivetted; by steam power also were the vessels on completion propelled, steered, pumped and drained, ventilated, lighted, loaded and discharged. The anchor was weighed, guns were trained, loaded and fired, and all the principal working opera-

tions were carried on by the aid of steam power. Between the ship of 2,000 years ago and the trading vessel of the last century there was very little difference in the matter of size. It was the application of steam power to propulsion and to manufacture that brought about about the production of vessels whose proportions were previously unapproachable. Steam power had not only provided a means of propulsion that was certain and regular in its action, it had in facilitating the manufacture of the raw material out of which ships were built enabled the dimensions to be very largely increased, with great increase of accommodation, comfort and safety. In smaller vessels the same degree of safety could not be obtained. Safety was a quality that was greatly increased by growth in dimensions. Taking everything into consideration, he thought they would agree that the inventions of James Watt were really the source of the improvements which had made ocean navigation what it was. Watt's steam engine was undoubtedly the greatest invention of modern times, and the one which had had the farthest reaching influence on the progress of the world. In Watt the philosopher and the mechanic were combined. If he had been merely a mechanic he could not have made the discoveries in natural science that were at the root of some of his principal inventions; if he had, on the other hand, been only a mathematician or a philosopher, he could not have embodied the results of his theoretical investigations in a practical working steam engine. He was the typical engineer, possessed of mechanical skill and experience, scientific knowledge and capacity, great powers of observation and original investigation, energetic, patient and persevering. Certain of these qualities other great engineers had possessed, but in none but Watt were they all together in such measure or so harmoniously blended. The benefits this country had derived from the application of the development of Watt's steam engine to ocean navigation could not be over-estimated. The development of our foreign trade had enormously increased the wealth of the rich and ameliorated the lot and brightened the lives of the poor, built up our manufacturing greatness, and enabled food to be brought from abroad in large and regular supplies at less than it could have been produced in this country. But although we had been favoured above most other peoples by all these changes, we should not forget that the privileges we enjoyed did not include immunity from danger. The relative perfection of ocean navigation increased our responsibilities and made more difficult the task of preserving unimpaired our heritage of power. The conditions

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which made ocean navigation easy, swift and sure for us made it easier also for possible enemies to attack us. The great problem for this country, therefore, was how best to protect itself and the ocean routes over which its food and raw material came against possible dangers of the kind he had indicated, and at the same time enjoy all the advantages and rewards of the prosperity which was its cause. It was on the sea that the real danger would arise, and on the sea it would have to be met. Therefore it was to be hoped that the nation which had covered all the seas of the world with its ships would show no want of energy and enterprise when the question was the defence of what it had produced with so much success and out of which it had reaped so rich a reward. If we shirked our responsibilities, the commercial greatness we owed to the genius of Watt would after all prove to be a curse instead of a blessing, and Britons be unworthy countrymen of the great engineer who had learned the world how, to quote Mr. Boulton's reply to Boswell, to "manufacture power."

NATIONAL ASSOCIATION OF MASTER BUILDERS.

THE thirty-fourth half-yearly meeting of the National Association of Master Builders of Great Britain was held on Tuesday in Birmingham, the mayor, Alderman Fallows, having granted the use of the Council Chamber for the purpose. Representatives to the number of eighty-six attended from Birmingham, London, Liverpool, Bath, Bristol, Derby, Hull, Manchester, Salford, Huddersfield, Cardiff, Bolton, Crewe, the Potteries and other parts of Staffordshire, Cambridge, Preston and Kidderminster. The Mayor gave the delegates a hearty welcome to Birmingham, and expressed pleasure at seeing so large a gathering, representing one of the chief industries of the country—an industry to which all classes of the community were so deeply indebted, and which at the present day was being carried on in many respects in a manner of which it might be proud. The president of the Association, Mr. John Bowen, then took the chair, and gave a short address. The report for the past half-year was presented and adopted, and the hon. treasurer, Mr. C. W. Green, presented the balance-sheet, which showed the Association to be in a sound financial position. The officers were re-elected:—Mr. J. Bowen, president; Mr. T. F. Ryder (London) and Mr.

J. S. Jones (Liverpool), vice-presidents; Mr. C. W. Green (Liverpool), hon. treasurer; and Mr. W. H. Smith (Northampton), hon. auditor. Matters of interest to the building trade were discussed, and the meeting concluded with a vote of thanks to the Mayor for the use of the Council Chamber, and to the President for his services to the Association. It was decided to hold the next meeting at Leicester in July. In the evening the delegates, with the local members and a number of visitors, were entertained by the president (Mr. Bowen) and the president of the Birmingham Association (Mr. T. Barnsley) to dinner at the Great Western Hotel, the company numbering about 140. Mr. Barnsley presided, and among those present were the Mayor, Mr. J. Bowen, Lieutenant-Colonel Stanley G. Bird, Major J. Barnsley, Alderman Edwards, Councillor Parkes, Councillor Baker, Messrs. J. C. Holder, W. Henman (president Birmingham Architectural Association), W. Sapcote, Aston Webb, C. W. Green, Allen Edwards, J. C. White (Liverpool), C. H. Barnsley (Preston), J. Randall (London), J. H. Marsden (Bolton), Banks, Mawson (Leeds), R. Beevers (Hull), F. W. Lloyd (building surveyor to the Birmingham Corporation), J. Botteley, T. Hill, A. G. Buller, J. C. Nicoll, J. Walker, J. S. Hassall (of Liverpool, secretary of the Association), and E. J. Bigwood (secretary of the Birmingham Association), &c. Apologies for absence were received from Alderman Johnson, Messrs. R. Neill, jun. (Manchester), J. M. Burt (London), J. Stevenson Jones (Liverpool), W. Southern (Salford), F. May (London), W. H. Bidlake, W. S. Till (city surveyor), &c. The toasts of "The Queen" and "The Prince and Princess of Wales" having been given, Mr. C. H. Barnsley proposed "The Army, Navy and Volunteers." Lieut.-Colonel Stanley, in his reply, pointed to the war in the East as illustrating the importance of having the forces of the country well equipped, and of having an efficient navy. Major J. Barnsley, whose name also had been coupled with the toast, expressed the opinion that the volunteers in Birmingham did not receive the support from the city to which they were entitled. The president of the National Association (County Alderman John Bowen) proposed "Our City," and referred to the Town Hall and the public buildings that had been erected and begun by the Corporation and other public bodies, down to the Technical School, as works of which the city as well as the designers and builders might well be proud. The toast was coupled with the names of the Mayor and Alderman Edwards. The Mayor, in responding, said that if there was one thing he was proud of

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it was that he was a Birmingham man, not only by birth, but by descent. His grandfather was a Birmingham solicitor, and his father was a Birmingham builder and worked with their President at the bench. Birmingham had been called the best-governed city in the world, but they did not claim the title themselves, for the title was given to Birmingham by an American after visiting many other cities. If the title were not deserved the Council would not rest until they had earned it. The buildings of Birmingham were well worthy of the inspection of the members of the National Association of Master Builders. In addition to those that had been mentioned, he would call attention to the Grammar School, which formed the stepping-stone to fame of Charles Barry, the architect of the Houses of Parliament. He might also mention the public offices in Moor Street, which at the time of their erection were considered an important building, and of which his father was the architect and builder. With regard to the Victoria Courts—the designer, Mr. Aston Webb, and the builder, Mr. Bowen, whom they were proud to have among them that evening—he was happy to say that he was the means, by proposing a resolution in the Council, of throwing the designs of that building open to competition, and he thought he was justified by the result. Alderman Edwards traced the growth of the city architecturally and in other respects. This he attributed partly to its central position and healthy elevation, and in no small measure to the public spirit evoked some twenty-five years ago by their great townsman, Mr. Joseph Chamberlain, who devoted his enormous abilities to the uplifting of the city life, and with the assistance of devoted colleagues had raised it to the high position it now held. Mr. Sapcote, in proposing “The Institute of British Architects and the Birmingham Architectural Association,” mentioned that in 1862, according to the directory, Birmingham had forty-six architects and 152 builders, while in 1894 the city had 111 architects and 343 builders. Mr. Henman, architect, spoke of the suggestion that every local governing body should have a department of works, and carry out its own building operations, as one of the follies of youth. The Corporation of Birmingham had wisely abandoned some of its infantile practices, and was to be commended upon the way in which for many years past its public buildings had been erected. He said this not with any disrespect to the permanent officials of the Corporation, but from the feeling that the procedure he condemned was inadvisable on several grounds, not the least of which was that

of economy. Mr. Aston Webb complimented the city upon having had the Victoria Courts built by Mr. Bowen as well as they possibly could be built, and upon the prospect of possessing a magnificent House of Mercy in the new General Hospital. Neither architects nor builders were to be held responsible for long rows of jerry-built houses; the men who were responsible were, in the majority of cases, persons who had not a workshop or even a yard. The toast of “The National Association of Master Builders of Great Britain,” coupled with the name of County Alderman Bowen, was given by the Chairman; while that of “The Birmingham Master Builders’ Association” was given by Mr. C. W. Green, the Chairman responding. The concluding toast, “Our Guests,” was proposed by Major Barnsley and responded to by Mr. J. C. Holder and Councillor Parkes.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 393. William Eckstein and John Alfred Whitmore, for “Improvements in ventilators.”
- 416. The Adamant Company, Limited, and John Wilkinson, for “A new or improved fireproof ceiling.”
- 479. John Tourtel, for “Improvements in locks.”
- 529. Charles Henry Rogers, for “Improvements in closet-pans and water-closet ventilation.”
- 596. William Whitehead, for “Improvements in cowl for the prevention of down-draughts in chimneys.”
- 706. Guy Locke, for “The up-draught chimney-pot.”
- 783. Alexander McBean, for “Improvements in and connected with windows.”
- 784. Edward Wilkinson, for “Improvements in draught excluders for doors and the like.”

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & CO., Patent Agents, 37 Chancery Lane, London, W.C.

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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

TENDERS, ETC.

* * As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

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Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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COMPETITIONS OPEN.

DURHAM.—March 25.—Competitive Schemes are Invited for the Sewage Disposal of the District. Premiums 100l. and 50l. for Two Best Schemes. Mr. F. Marshall, Town Clerk, Durham.

IPSWICH.—March 25.—Designs are Invited for the Building of a Workhouse and Infirmary, with Specifications and Estimate. Premiums 100l. and 50l. Mr. A. F. Vulliamy, Clerk to the Guardians.

LEEK.—March 4.—Designs are Invited for Proposed Covered Markets. Premiums 50l., 25l. and 10l. offered. Right reserved to carry out the Work by the Board's Architect. Mr. C. Henshaw, Clerk to the Improvement Commissioners, Leek.

CONTRACTS OPEN.

ABERDEEN.—Feb. 6.—For Works in Building Medical Wards at Royal Infirmary. Messrs. Smith & Kelly, Architects, 170 Union Street, Aberdeen.

ACCRINGTON.—For Building Post Office and Caretaker's House. Messrs. Heywood & Harrison, Architects, Commercial Chambers, Accrington.

ACCRINGTON.—Feb. 8.—For Extension of Wesleyan Chapel and School. Mr. R. Dixon, 5 Birch Street, Accrington.

ALNWICK.—Feb. 2.—For Additions to Prudhoe Villa. Mr. George Reavell, jun., Architect, Alnwick.

ARMAGH.—March 1.—For Wrought-iron Girder Road Bridge. Mr. Joseph Atkinson, junr., Court House, Armagh.

ASHFORD.—March 4.—For Erection of a Board School with Master's Residence and Offices. Mr. H. J. Jeffery, Architect, Ashford.

ASTON-CUM-AUGHTON.—Feb. 5.—For Building Teacher's Residence at Board School. Mr. F. Leonard Sorby, Architect, Todwick, near Sheffield.

BANGOR.—Feb. 2.—For Building Baptist Chapel at Glanadda. Mr. R. Glynne Davies, Architect, 220 High Street, Bangor.

BARNLEY.—Feb. 6.—For Porter's Lodge at Beckett Hospital. Mr. Robert Dixon, Architect, 5 Eastgate, Barnley.

BARNLEY.—Feb. 6.—For Building Two Houses. Messrs. Wade & Turner, Architects, 10 Pitt Street, Barnley.

BENGAL.—Feb. 4.—For Steam Hoists (3 Tons and 5 Tons lifting) and Tyres for Railway Company. Mr. E. L. Marryat, 237 Gresham House, Old Broad Street, E.C.

BETHNAL GREEN.—Feb. 7.—For Supply of 500 Tons Broken Blue Guernsey Granite. Mr. F. W. Barratt, Vestry Hall, Church Row, Bethnal Green.

BILSTON.—Feb. 9.—For the Construction of Engine-house, Boiler-house, Well-house, Workshop, Coal Shed, Chimney Shaft, Entrance Gates, Fencing, Road-making, &c. Mr. Baldwin Latham, M.I.C.E., 13 Victoria Street, S.W.

BLAENAVON.—Feb. 6.—For Building Vicarage. Mr. E. M. B. Vaughan, Architect, Cardiff.

BOSTALL HEATH.—Feb. 12.—For Erecting Public Convenience, Bothy, &c. Mr. H. De la Hooke, L.C.C., Spring Gardens, S.W.

BOURNEMOUTH.—Feb. 9.—For Erection of Show Building and Works in Connection with the Royal Counties Agricultural Society. Mr. Charles Simmons, Basingstoke.

BOURNE.—Feb. 24.—For Works to Board School (Local Tenders only). Mr. Alexander Farr, Clerk, Bourne, Lincolnshire.

BRADFORD.—Feb. 2.—For Building Sixteen Houses. Mr. J. H. Dixon, Architect, 90 Heap Lane, Otley Road, Bradford.

BRYNMAWR.—Feb. 12.—For Additions to Board Schools, Building Caretaker's House, Boundary Walls, &c. Mr. E. A. Johnson, Architect, Abergavenny.

BRYMBO.—Feb. 7.—For Additions to the Vron Schools. Mr. W. Moss, Architect, Belgrave Cottage, New Broughton.

CAMBERWELL.—Feb. 5.—For Construction of 12-inch Pipe Sewers. Mr. O. S. Brown, Vestry Hall, Camberwell.

CANTERBURY.—Feb. 2.—For Pulling-down Old Premises, St. Radigund's Street, and Building Four Cottages. Mr. W. J. Jennings, Architect, 4 St. Margaret Street, Canterbury.

CARLISLE.—Feb. 11.—For Building House for Private Patients at the Lunatic Asylum. Mr. G. D. Oliver, Architect, Carlisle.

CARRICK-ON-SUIR.—Feb. 2.—For Building Twenty-three Cottages and other Work. Mr. J. Mullins, Clerk to the Guardians, Carrick-on-Suir.

CHESTER-LE-STREET.—Feb. 9.—For Rebuilding Premises, Front Street. Mr. H. T. Gradon, Architect, 22 Market Place, Durham.

CLEATOR MOOR.—Feb. 2.—For Alterations to Market Hall. Mr. Henry Rothery, Clerk to the Urban District Council.

CLONES.—Feb. 4.—For Carrying-out Waterworks. Mr. J. H. H. Swiney, Engineer, Avenue Chambers, Belfast.

CORK.—Feb. 6.—For Two Turret Closets at Fever Hospital. Mr. J. Cotter, Clerk to the Guardians.

COWBRIDGE.—For Restoration and Enlargement of Town Hall. Mr. C. B. Fowler, Architect, Old Bank Chambers, High Street, Cardiff.

DARNELL.—For Building Eight Houses and Seven Houses, Darnell and Healey. Mr. J. P. Earle, Architect, Temple Chambers, Norfolk Street, Sheffield.

DONCASTER.—Feb. 7.—For Additions to Telegraph Department. Plans, &c., at the Steward's Office, Mansion House, Doncaster.

DORKING.—Feb. 5.—For Boundary Walls, Entrance Gates, Forming Paths, &c., at Cemetery. Mr. W. J. Down, Clerk, 72 High Street, Dorking.

FARNHAM.—Feb. 5.—For Additions to Wrecchlesham Schools. Mr. W. J. Wells, Architect, West Street, Farnham.

FORT WILLIAM.—Feb. 2.—For Two Sets of Shanks's Patent Closets and Urinals, for Public Schools. Mr. Daniel McLeish, Clerk to the School Board, Fort William, N.B.

GODALMING.—Feb. 14.—For Building Cemetery Chapels, Lodge and other Works. Messrs. Welman & Street, Church Street, Godalming.

GRAVESEND.—Feb. 2.—For Construction of Rifle Butts at Milton. Lieutenant-Colonel F. P. Washington, Royal Engineer Office, Gravesend.

HARROGATE.—For Building Detached House. Messrs. H. E. & A. Bown, Architects, Harrogate.

HASLINGDEN.—Feb. 16.—For Construction of the following Lengths of Brick Sewers, viz. 1,213 Lineal Yards 3 feet 4 inches Diameter Sewer in 9-inch Brickwork; 1,628 Lineal Yards, 3 feet 6 inches by 2 feet 4 inches in 9-inch Brickwork; 25 Lineal Yards 3 feet Barrel Overflow Sewer in 9-inch Brickwork—2,866 Lineal Yards. Together with Bell-mouth Junction, Overflow and Penstock Chambers, Manholes, and other Works in Connection therewith. Mr. Henry A. Cutler, A.M.I.C.E., Municipal Offices, Rawtonstall.

HAVERSTOCK HILL.—Feb. 7.—For Erection of Six Wards at North-Western Fever Hospital. Metropolitan Asylums Board, Norfolk House, Norfolk Street, Strand.

HENLEY-IN-ARDEN.—Feb. 14.—For Construction of Sewerage Works and Supply of Cast-iron Pipes, &c. Mr. J. Edward Willcox, C.E., Union Chambers, Temple Row, Birmingham.

KENDAL.—Feb. 4.—For Building Two Pairs of Semi-Detached Houses. Mr. John Stalker, Architect, 57 Highgate, Kendal.

LANCHESTER.—Feb. 13.—For Building Infectious Hospital. Mr. J. W. Rounthwaite, Architect, 13 Mosley Street, Newcastle-on-Tyne.

LANGPORT.—Feb. 23.—For Construction of Waterworks. Mr. J. T. Hawkins, Engineer, Somerton.

LATHOM.—Feb. 11.—For Supply and Delivery of 220 Tons 6-inch, 5-inch, and 4-inch Cast-iron Water-pipes. Messrs. Wood & Brodie, 3 Cork Street, Liverpool.

LEEDS.—Feb. 9.—For Building Three Detached Residences, Roundhay. Mr. W. Carby Hall, Architect, 42 Prudential Buildings, Park Row, Leeds.

LEEDS.—Feb. 4.—For Alterations at Three Hotels. Mr. Thomas Winn, Architect, 90 Albion Street, Leeds.

LINCOLN.—Feb. 13.—For Construction of Filters at Irrigation Farm. Mr. R. A. MacBrair, City Surveyor, Silver Street, Lincoln.

LITTLE BADDOW.—Feb. 1.—For Additions to National Schools. Mr. Charles Pertwee, Architect, Chelmsford.

LLANGATTOCK.—Feb. 4.—For Additions to Beaufort Hill Schools. Mr. W. S. Williams, Tredegar.

LONDON.—Feb. 12.—For Constructing Public Conveniences, Bothy, &c., Bostall Heath. Architect's Department, County Hall, Spring Gardens, S.W.

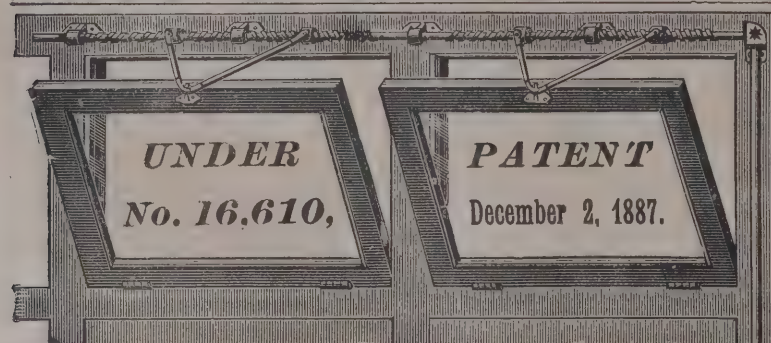
LONGFORD.—Feb. 5.—For Building Methodist Church. Rev. G. W. Rea, Rose Lawn, Longford, Ireland.

LUTON.—Feb. 5.—For Building Two Lodges, &c. The Borough Surveyor.

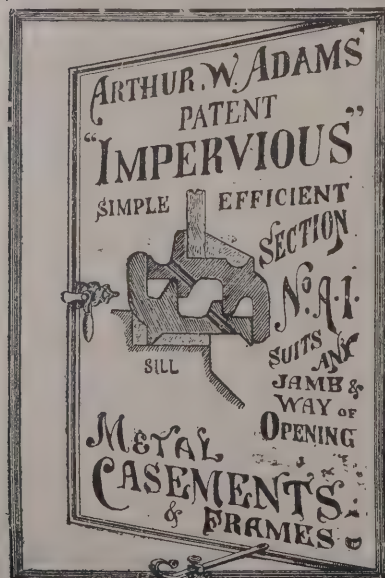
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NORTH LONDON.—Feb. 11.—For Chimney Shaft, Boiler Setting, &c. Messrs. Thomas & Taylor, 99 Fonthill Road, Finsbury Park, N.

NORWICH.—Feb. 2.—For Supply of Broken Granite for One Year from March 31. Mr. T. H. B. Hislop, C.E., Norwich.

NOTTINGHAM.—For Building Shops and Offices. Mr. John Howitt, Architect, 3 King John Chambers, Nottingham.

NOTTINGHAM.—For Building House. Messrs. Marshall & Turner, Architects, Long Row, Nottingham.

ORMSKIRK.—Feb. 11.—For Laying Mains. Messrs. Wood & Brodie, Engineers, 3 Cook Street, Liverpool.

PETERBOROUGH.—Feb. 2.—For Hot-water Apparatus for Workhouse. Mr. J. G. Stallebrass, Architect, North Street, Peterborough.

PENRHIWCEIBER.—Feb. 6.—For Building Fourteen Cottages. Mr. W. James, Penrikybor Villa, Penrhiwceiber.

PLYMOUTH.—Feb. 4.—For Extension of Meat Market and Weighing House. Messrs. King & Lister, Architects, 20 Princess Square, Plymouth.

ROTHERHAM.—Feb. 4.—For Building Police Offices, Cells, Courts, &c. Mr. R. J. Lovell, Architect, 46 Queen Victoria Street, E.C.

SEASCALE.—Feb. 4.—For Additions to Seafeld House. Messrs. Pickering & Crompton, Architects, 11 Lowther Street, Whitehaven.

SHIPLEY.—Feb. 2.—For Building Eight Houses, Windhill. Messrs. J. Charles & Son, Architects, 98 Albion Street, Leeds.

ST. MARYLEBONE.—Feb. 1.—For the Supply of Broken Stone Footway Kerb and other Footway Paving. Mr. W. H. Garbutt, Court House, St. Marylebone.

ST. MARYLEBONE.—Feb. 1.—For the Execution of Works and Supply of Materials for One Year from March 25. Mr. W. H. Garbutt, Court House, St. Marylebone.

ST. SAVIOUR'S.—Feb. 6.—For Supply of Compressed Rock Asphalte, Portland Cement, Lime, Thames Ballast, Sand, York Paving, Granite Kerb and Drain Pipes. Mr. W. H. Atkins, Emerson Street, Southwark.

SWANSEA.—Feb. 7.—For Erection of a Warehouse. Mr. A. O. Schenk, Harbour Offices, Swansea.

TONBRIDGE.—Feb. 8.—For Supply and Fixing Cornish Boilers and Cooking Range, with Ovens, Steam Jacketted Boiling Pans, Vegetable Steaming Closets, Steam Hot-plate, Circulating Tank, &c. Messrs. Clements, Jeakes & Co., 51 Great Russell Street, W.C.

TREORKY.—Feb. 14.—For Building Two Shops, &c. Mr. J. Rees, Architect, Hill Side, Pentre, Rhondda.

UCKFIELD.—Feb. 25.—For Taking-up and Relaying about 350 Lineal Yards of 18-inch Stoneware Pipe Sewer, Alter and Enlarge Sewage Tanks, Build Sewage Well and Engine House, Provide and Fix Gas Engine and Pumping Machinery, Lay about 450 Lineal Yards of 6-inch Cast-iron Rising Main, with all Valves &c. necessary, also 350 Lineal Yards of 9-inch Stoneware Outfall Sewer, Lay-out and Under-drain the Irrigation Area, Build all necessary Manholes, Valve Chambers. Mr. Wm. Willis Gale, East Grinstead, Sussex.

WANSTEAD.—Feb. 6.—For Building Additions to School. Mr. J. T. Bressey, 70 Bishopsgate Street Within.

WARWICK.—Feb. 4.—For Alteration and Additions to the National Schools. Mr. F. N. Moore, 2 Northgate Street, Warwick.

WEST BRIDGFORD.—Feb. 8.—For Alterations to Bridge. Mr. W. H. Radford, Engineer, Angel Row, Nottingham.

WESTMINSTER.—Feb. 6.—For Supply of Stores for One Year. Mr. G. R. W. Wheeler, Town Hall, Caxton Street, Westminster.

WESTON-SUPER-MARE.—Feb. 1.—For Building Temporary Board School. Messrs. Price & Wooler, Architects, Waterloo Street, Weston-super-Mare.

THE *Norwich Mercury* says that during the gale and high tide on Wednesday last week the old tower at Eccles, situated upon the beach between Hasborough and Palling, collapsed and fell. Eccles parish has been one of the chief sufferers from the encroachments of the sea on the Norfolk coast, and its acreage has been reduced from 2,000 to some 290. The church was dedicated to St. Mary, and has long been invisible save when the beach has been blown clear of sand, but the old round tower has been a well-known sea mark for many years.

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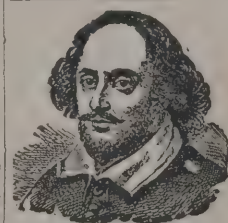
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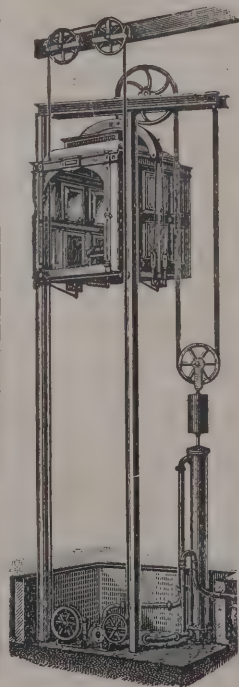
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Austin & Lewis	209	0	0
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J. J. Hall	151	7	0
Engineer's estimate	200	0	0

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For Building Police Station, Farnborough. Mr. JAMES ROBINSON, County Surveyor, 13 Southgate Street, Winchester.

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Stephens, Bastow & Co., Montpelier, Bristol	3,298	0	0
Claridge & Bloxham, Banbury	3,108	0	0
W. Hughes, Farnborough	2,934	10	0
Mussellwhite & Son, Basingstoke	2,890	0	0
J. H. Corke, Southsea	2,879	0	0
A. Tennant, Farnborough	2,878	0	7
G. Kemp, Aldershot	2,717	0	0
T. Martin, Maidenhead	2,330	0	0
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Liming, Crookham	3,631	0	0
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Surveyor's estimate	150	0	0

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G. G. Wade, Flood Street, Chelsea	4,583	0	0
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W. H. Smith, Walham Green	4,380	0	0
J. Bullers, Bermondsey	4,338	0	0
A. J. Thompson, Brecknock Road	4,249	0	0
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G. Davis	198	0	0
Duffield & Co.	196	18	0
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Harrison & Spooner	1,577	0	0
E. Lawrance & Sons	1,550	0	0
G. Newton	1,518	0	0
J. Garrett & Son	1,480	0	0
M. Calnan & Co.	1,388	0	0
T. White & Son	1,329	0	0
F. G. Minter	1,165	0	0

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Holloway Bros.	£1,860	0	0
Lathey Bros.	1,780	0	0
W. Downs	1,628	0	0
W. V. Goad	1,591	0	0
L. Whitehead & Co.	1,569	0	0
J. Marsland	1,525	0	0
J. Frampton	1,525	0	0
G. Newton	1,516	0	0
E. Triggs	1,495	0	0

For Private Street Works, Standard Road, Enfield Lock, for the Enfield Urban District Council. Mr. R. COLLINS, Surveyor.

Lagdon & Crawford, Mile End	£1,280	0	0
J. Dixon, St. Albans	1,058	0	0
T. Adams, Wood Green	1,042	0	0
Fry Bros, Greenwich	887	0	0
W. Griffiths, Kingsland Road	863	0	0
W. Nicholls, Wood Green	841	0	0
J. E. Betts, Enfield Highway	829	0	0
Lee & Son, High Wycombe	797	0	0
J. JACKSON & SON, Enfield Town (accepted)	770	14	0
Surveyor's estimate	912	0	0

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Yerbury & Sons	3,610	10	0
Coulsell Bros.	3,360	0	0
Baxter	3,337	0	0
Barrett & Power	3,290	0	0
Stevens Bros.	3,020	0	0
Williamson & Son	2,843	0	0
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A. Broxup & Sons, Horton	5,847	0	0
G. Bell, Manchester	5,688	0	0
G. Pearson, Cleckheaton	5,630	0	0
T. & M. Maston, Otley	5,450	5	8
A. Braithwaite, Horsforth	5,388	0	0
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J. Schofield, Sons & Co., Leeds	5,246	4	8
J. E. Madin, Sheffield	5,098	0	0
J. & T. Young, Otley	5,000	0	0
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PENZANCE.

For Construction of Sewer at Penrose and Trewartha Terraces. Mr. G. H. SMALL, Borough Surveyor.			
W. H. Stephens, Penzance	£225	0	0
J. RUNNALLS, jun, Penzance (accepted)	120	10	6

QUEENSFERRY.

For Iron Bridge with Opening Span across the River Dee at Queensferry, below Chester, for the Flint County Council, Mr. T. W. BARBER, Engineer, 165 Queen Victoria Street, London.

Contract No. 1.

Markham & Co, Limited, Chesterfield	£24,000	0	0
Cochrane & Co, Dudley	12,562	0	0
Heenan & Froude, Manchester	10,790	0	0
A. Handyside & Co, Limited, Derby	10,637	17	5
J. Shewell & Co., Darlington	10,154	1	2
Phoenix Foundry Co., Derby	10,032	6	7
Sir W. Arrol & Co., Glasgow	9,468	0	0
Cleveland Bridge and Engineering Co., Darlington	9,376	0	0
J. Butler & Co, Leeds	9,374	12	9
Head, Wrightson & Co, Thornaby-on-Tees	9,305	13	0
Dallam Forge, Warrington	9,270	0	0
TEES SIDE IRON AND ENGINE WORKS CO. (accepted)	8,514	0	0

Contract No. 3.

Holmes & King, Liverpool	£3,327	0	0
W. Winnard, Wigan	2,744	12	11
J. Butler & Co.	2,236	0	0
J. Moffat	2,053	0	0
J. SCHOFIELD, SONS & CO., Leeds (accepted)	1,769	1	4
A. Handyside & Co.	1,143	5	0



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Contract No. 2.

Markham & Co., Limited	1,600	0	0
Scriven & Co., Leeds	1,415	0	0
J. Abbot & Co., Gateshead-on-Tyne	1,060	0	0
Glenfield Co., Kilmarnock	1,012	6	0
Union Foundry Co., Kidsgrove	900	0	0
A. Handyside & Co.	2,140	0	0
Pearson & Knowles Co.	1,675	0	0
Heenan & Froude, Birmingham	1,395	0	0
Phoenix Foundry Co., Derby	1,317	0	0
Head, Wrightson & Co.	1,159	19	6
Hydraulic Engineering Co.	1,143	5	0
TEES SIDE IRON CO. (accepted)	967	0	0

SCARCROFT.

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Accepted Tenders.

Keswick, York, brick and stone work.

Bellerby, York, carpenter and joiner.

Watson & Worsnop, slaters.

J. Shonksmith, York, plumber.

J. Thomas, York, painter.

Total, £15,462 7s. 7d.

SEVENOAKS.

For Erection of Five Fire Exit Staircases and other Works in Connection therewith at the Sevenoaks Union Workhouse.

Mr. T. POTTER, Architect, Sevenoaks.

G. Smith & Co., London	£346	0	0
Merryweather & Sons, Limited, London	344	0	10
Moorwood, Sons & Co., London	339	0	0
T. Potter & Sons, London	337	0	0
J. & F. May, London	286	10	0
Constructional Ironworks Co., Limited, Bow	281	0	0
E. J. Raybould & Co., Workington	270	0	0
Lion Foundry Co., Limited, London	266	11	0
Blackwall Iron Co., Limited, London	240	0	0
St Pancras Ironwork Co., London	239	0	0
W. Coker, Rochester	228	0	0
L. Faulkner & Sons, Walton-on-Thames	226	3	10
R. Durnell, Brasted	225	0	0
H. Miller, Strood	223	5	0
J. Sibley, Westerham	199	0	0
W. S. Freeman, Olford	196	0	0
J. F. Clarke & Sons, London	182	0	0

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For Lecture-room, Laboratory, Workroom and Store-rooms adjoining Existing School Buildings for Boys in East Street, Taunton, and for Repairing the Master's House, for the Governors of the Huish Middle-class Public Endowed School. Mr. J. HOUGHTON SPENCER, Architect
8 Hammet Street, Taunton.

New Buildings.

J. Mountstephens	£1,690	0	0
H. Phillips	1,530	0	0
S. Derham	1,480	0	0
J. Morse	1,414	0	0
F. W. Rowsell	1,386	14	0
G. H. POLLARD (accepted)	1,370	0	0

Repairs.

J. Mountstephens	310	0	0
H. Phillips	292	0	0
G. H. Pollard	270	0	0
J. Morse	256	10	0
S. Derham	256	0	0
F. W. ROWSELL (accepted)	232	10	0

TONBRIDGE.

For Construction of Road, with Sewers, Drains, &c., through the Lyons Estate, Tonbridge. Mr. W. BARNESLY HUGHES, Surveyor, Tunbridge Wells.

Strange & Sons, Tunbridge Wells	£2,493	0	0
E. Punnett & Son, Tonbridge	2,452	0	0
W. H. Wheeler, Southwark	2,426	18	9
G. A. Franks, Guildford	2,348	11	11
J. Jarvis, Tunbridge Wells	1,947	3	2

WOOD MOULDINGS.

MESSRS. J. M. BENNETT & SONS, timber merchants and moulding manufacturers, Manchester, have just issued the first of a new series of catalogues of standard wood mouldings for use of cabinet work and cabinet makers, with price list included. In bringing before the public this catalogue of straight mouldings, Messrs. Bennett & Sons state that they have applied several new improvements to their moulding machines which will enable them to manufacture mouldings of the best workmanship, cleanly cut and sharp (equal to the finish of their Goehring mouldings), in any kind of wood, and also that they will be pleased to execute orders for special designs in any kind of wood.

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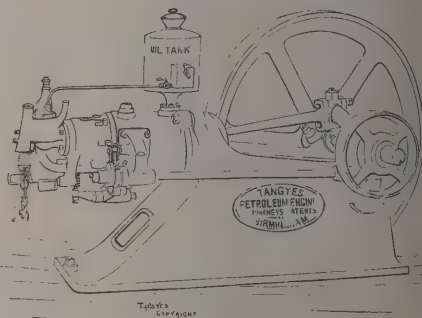
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TRADE NOTES.

THE peal of eight bells are being rehung in St. Giles's parish church, Northampton, in a new iron frame by Messrs. Taylor & Co., of Loughborough, and the clock is being restored and having Cambridge chimes fitted by Messrs. John Smith & Sons, Derby. The whole of the work is being carried out under the supervision of Mr. Holding, architect, of Northampton.

THE new convent schools, Strabane, are being warmed and ventilated throughout by means of Shorland's patent Manchester grates and improved inlet panels, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

WE are informed that the Hornsey District Council have placed the contract for supplying 100 cast-iron street gullies, the estimates for which appeared in a recent issue, in the hands of Messrs. J. C. & J. S. Ellis, of Sheffield, Messrs. Moreton, of Westminster, having withdrawn their tender.

ELECTRICAL.

THE Board of Trade have addressed a letter to the London County Council stating that, after a careful consideration of representations made at the recent hearing of all parties, they are not prepared to hold that sufficient reasons have been advanced either on the ground of public safety or of want of parliamentary sanction, to justify them in refusing to approve of a system of electric supply which involves the use of transforming chambers under the public streets; but that they at the same time consider that the use of the public streets for such a purpose should be as much as possible limited, and that the chambers should be placed where they do not unreasonably interfere with underground works of any kind.

THE tramways committee of the Leeds Corporation recommend the adoption of an electric system of haulage for the city tramways.

THE electric light has just been inaugurated in Belfast, being made use of by several large establishments—the Theatre Royal, the Alhambra Music Hall, the Ulster Bank, and most of the large trading houses in the centre of the city. It is under

Corporation auspices, the central station being situate in Chapel Lane. The streets will not be lighted by it at present, but the light will be at the service of any members of the public who choose to purchase it. The work of installation was planned by Professor Kennedy, of London, and carried out under his superintendence by Mr. McCowan.

At the meeting of the Royal Scottish Society of Arts a paper on "Filter Press Machinery for Sewage Disposal Works" was read by William Fairley, C.E., dealing with the most recent practice of disposal in destructors by steamships, as carried out by the London County Council, and filter presses. In the course of the discussion on the paper the question of electrical treatment was raised, and Mr. Fairley stated that shortly there would be brought before the public a system by which the process of electrical treatment would be very much cheapened. At present where electric light stations had been put down it was well known that the great cost was owing to the unequal load during the twenty-four hours, and he had a proposal by which the whole of the sewage would be treated by electricity. The filtering medium would be used to assist and generate steam, and the whole process of sewage purification and lighting of the public streets would be overtaken by the same engine, plant and the same manual labour, thus reducing the cost of lighting and of purification.

BUILDING AND BUILDERS.

THE committee of the Harrogate Cottage Hospital have made a recommendation to the governors and subscribers to increase the accommodation of the institution by providing seventeen additional beds.

PLANS for the enlargement of Crief Post-office have been prepared. The increasing business during the last ten years has rendered the present accommodation inadequate.

IT is proposed to reconstruct the Arbroath Railway Station and to carry out extensive improvements.

AT the meeting of the Edinburgh Dean of Guild Court a warrant was granted to the Rev. W. Kilpatrick and others,

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Gorgie Free Church trustees, to erect a new church and offices at Slateford Road. The church will in the style of its architecture be based on Scottish fifteenth-century work. The plans, prepared by Messrs. M'Arthy & Watson, Frederick Street, Edinburgh, show a substantial building, measuring in extreme length in the interior 89 feet, and in width 51 feet, providing sitting accommodation for 760 persons. The estimated cost of the church is 4,300*l*.

CHURCH schools have recently been opened at Needwood, the buildings having been erected at a cost of over 2,000*l*, exclusive of site, by Mr. Hamar Bass, M.P. Mr. Bass has also undertaken the erection of a new vicarage at a cost of something like 1,500*l*, the architect in each case being Mr. Robey E. Carpenter, Burton, and the contractors:—Mr. W. Sharp (Barton-under-Needwood) for the general work, Mr. Mason (Burton) for joiners' work, and Mr. Turner (Burton) for plumbing work.

VARIETIES.

At the meeting of the Carlisle Architectural Society a lecture was delivered before the members in the Town Hall by Mr. S. W. B. Jack on "Some of Our Cathedrals." No country in proportion to its size, he said, was really so rich in examples of ecclesiastical architecture as England.

THE War Department has decided to make extensive additions to the barrack accommodation at Shorncliffe Camp, and for this purpose extra land has been procured. The cavalry quarters will be enlarged, and it is contemplated to run a line from Shorncliffe Station into the camp. The coast-guard quarters at Sandgate, which were injured by the landslide, are to be pulled down and others built in their place.

A NEW dry dock, said to be the largest in the United Kingdom, has lately been opened by the Wallsend Slipway and Engineering Company at Wallsend-on-Tyne.

PLANS have been prepared for the erection of a cottage hospital at Jedburgh, the cost of which will be defrayed by Mr. and Miss M'Millan Scott, in memory of a deceased sister.

THE Middlesbrough Town Council have appointed Mr. F. Baker, of Canterbury, as borough surveyor, at a salary of 450*l*. per annum.

ESTIMATES are to be invited for the erection of the Hope Hospital, Langholme, Cumberland. The plans have been

prepared by Mr. Woods, Architect, London. The building, which is on the cottage hospital principle, will be 200 feet long by 160 feet deep.

At the meeting of the London and Provincial Builders' Foremen's Association at the Memorial Hall, E.C., Saturday, February 2, a paper will be read by Mr. Geo. Barclay on roofs and roof construction.

WE have received a sample card of pens from Messrs. John Heath & Co., of Birmingham. The No.'s 444 and 801 seem exceptionally good for a bold freehand writing. We may mention that these pens can be obtained through any stationer.

At the general meeting of the Association of Sanitary Inspectors in Scotland held in Linlithgow, papers were read on the sanitary aspects of workshops legislation and of the recent Parish Councils Act.

At the meeting of the Glasgow Association of Students of the Institution of Civil Engineers, Mr. Angus M. Stewart read a paper on "The Glasgow District Subway."

THE inhabitants of St. Margaret's Bay are becoming alarmed at the encroachment of the sea on that point and between the South Foreland lighthouses and the bay. Frequent falls of cliff are taking place at the South Foreland, and another large fall has just taken place. The effect on the foreshore at St. Margaret's is becoming disastrous. Twelve feet have been swept away since Christmas, and the erosion continues at the same rate. The mischief has been going on seriously for some years along the whole line of cliff between Dover and St. Margaret's Bay. It is supposed that the encroachment of the sea in this direction is due in some measure to the growth of Dungeness Point.

THE annual prizes at the Leamington School of Art were distributed by Dr. T. W. Thursfield, mayor. He took occasion to speak of what had happened in regard to carpet designing at Kidderminster as an illustration of the value of art education. He remembered the time when the whole work of carpet designing at Kidderminster was in the hands of Frenchmen, because no English designer could be found of sufficient art education or art aptitude for the work. Such, however, was the progress that had been made in art education that not only was the whole of the designing for Kidderminster carpets now done by English educated at Kidderminster Art School, but the students of that school were in great request throughout the country.

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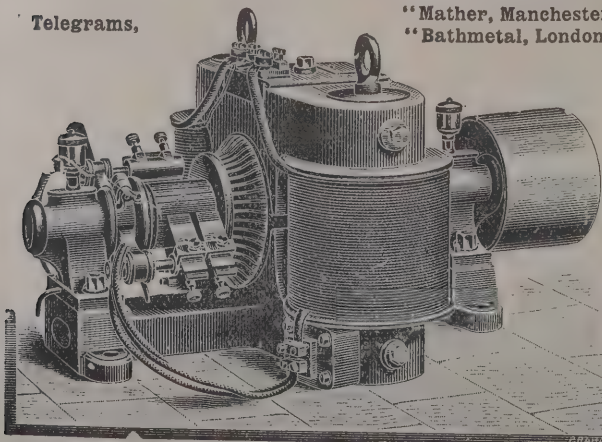
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"MANCHESTER" DYNAMO.

SOME of the relations between geology and architecture were suggested by a lecture which Mr. Goodchild, of the Geological Survey, delivered in Edinburgh on Saturday. He argued that the direction of some of the Edinburgh streets, and even their corners, had been determined by physical conditions, and the reason of many of the architectural features of Edinburgh could not be understood unless something was known of the geological features of the district. Edinburgh consisted of a series of ridges and furrows. Princes Street, George Street and Queen Street coincided with those east and west ridges, for instance, and in Princes Street Gardens the North British Railway ran in one of the grooves. Edinburgh in that respect was typical of the district. Mr. Goodchild ascribed to glacial causes the configuration of the ground. He said there was not much doubt these great furrows and ridges had been shaped out by the action of masses of ice moving over them for centuries eastwards towards the sea. When there was an amelioration of the climate the ice vanished, but left boulders behind it, and when men came to portion out the land they left as corners and landmarks the great boulders. That applied to Edinburgh, where many of the streets had been determined by features due to glacial causes. Dealing next with the effect of volcanic action, Mr. Goodchild stated that what he termed the Edinburgh volcano must have been about the same shape as Vesuvius, and must have undergone many changes. He pointed to traces of it in the Queen's Park, the Calton Hill, Craiglockhart, and near Granton and Colinton, and expressed the opinion that the centre of volcanic action was somewhere between Arthur Seat and the Castle.

MR. VANDERBILT'S HOUSE.

It is announced from New York that Mr. Cornelius Vanderbilt, the New York millionaire, has opened his new palace with a grand ball. This building, which is to shelter about ten people during six months of the year, and to remain closed during the other six, stands at the corner of Fifty-seventh Street and Fifth Avenue, and has cost its owner 1,000,000*l.* It is of Spanish design outside, built of grey stone with red facings, turrets and battlements. It is three storeys high, with a lofty attic. The ball-room is the largest private ball-room in New York, being 75 feet long by 50 feet wide, decorated in white and gold Louis XIV. style. The ceiling cost a fortune, and is made in the form of a double cone, covered with painted nymphs and

cupids by the late M. Baudry. Round the cornice are delicately-modelled flowers, each with an electric light, while an immense crystal chandelier hangs from the centre. The walls on the night of the opening ball were covered from floor to ceiling with natural flowers, at a cost of 1,000*l.* Adjoining the mansion is the most expensive garden for its size in the world, for although it is only the size of an ordinary city lot the sum of 70,000*l.* was paid for it, and a house which had cost 25,000*l.* to build was taken down to make room for the few flower-beds.

COUNTY COUNCIL EXTRAVAGANCE.

THE following letter from Mr. T. B. Westacott appears in the *Standard*:—Much has been written and said as to the cost of painting Hammersmith Bridge, and anyone not knowing the facts would imagine that that was the only job done by the works committee of which the facts are known. With your permission, I will give a few more instances of "how the money goes."

The works committee was first appointed in December, 1892, and very soon after works were referred to them to carry out. Early in 1893 central premises at Belvedere Road, Lambeth, were taken at a rent of 1,500*l.* a year, which premises have been since purchased by the Council for 39,000*l.* Since purchasing them the Council, on the advice of the works committee, has decided to expend 13,000*l.* on new workshops, 12,000*l.* on offices, 6,200*l.* for machinery, 13,000*l.* for stables and 7,250*l.* on river wall, making a total expenditure of 90,450*l.* on the central yard. And those works are now in hand.

The number of men employed in the Works Department varies from time to time; but on the 11th instant there were 1,370 men employed, and that is less than are often employed, there sometimes being over 1,700. Although the Council resolved that the committee should, on the completion of the works referred to them, forthwith report to the Council that such works were completed, with particulars of the estimated and actual cost thereof, will it be believed that up to the present time the Council has only had particulars from them of thirty-two works which have been carried out by them? although it is well known that many more have been completed, and I do not think I am wrong in saying that between 2,000 and 3,000 different works referred to them by the Council



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JOHN SELL COTMAN'S PICTURES, lately on Exhibition at the Burlington Fine Arts Club. The Plates are uniform in size, Twenty-one Inches by Fifteen Inches. The Titles are as follows:—1. Rouen from Mount St. Catherine. 2. Breaking the Clod. 3. View in North Wales. 4. Norman Arches. 5. Byland Abbey. 6. Norwich, from the Cromer Road. 7. Dewy Eve. 8. Mousehold Heath. 9. Cader Idris. 10. Castle Eden Dean, Durham. 11. Bamborough Castle. 12. The Interior of Norwich Cathedral. 13. Mountain Pass in the Tyrol. 14. Postwick Grove.

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and committees have been completed of which we have had no account or particulars.

On looking over the items in the return which has been made, we find that the industrial schools committee wanted two cottages built at Mayford, which they were advised by their architect could be built for 850*l.* The works committee said they could not do the work for less than 925*l.*, which the Council agreed to; but we find that they cost 1,116*l.* 12*s.*, on which the Council pays 3 per cent. interest. The cottages bring in 9*s.* a week, or 23*l.* 8*s.* a year, out of which the Council pays the rates.

The parks committee wanted a lodge and conveniences built at Plumstead Common, which they were advised by the Council's architect could be built for 1,070*l.* Tenders were invited, the lowest of which was 889*l.*, the next 940*l.*, the next 945*l.*, and there were four higher ones. Instead of having the work done by a contractor it was given to the works committee, whose account amounts to 1,345*l.* 0*s.* 7*d.*, being 275*l.* 0*s.* 7*d.* above the architect's estimate, and 456*l.* 0*s.* 7*d.* above the lowest tender.

A new fire station was to be built at New Cross, at an estimated cost of 16,000*l.* Seven tenders were received from respectable builders, all of them being under the estimate. The lowest was withdrawn, but instead of giving the work to the next lowest, which was 14,537*l.*, it was given to the works committee, whose account for building same was 18,789*l.* 5*s.*, being 2,789*l.* 5*s.* above the architect's estimate, and 4,252*l.* 5*s.* more than the Council could have got it done by a contractor.

A shelter for cricketers at Southwark Park was estimated to cost 474*l.* 2*s.* 9*d.*, but actually cost 632*l.* 4*s.* 3*d.*; some conveniences at Clapham Common, which were estimated to cost 707*l.* 17*s.*, actually cost 1,054*l.* 12*s.*; a boundary wall at Waterlow Park, which was estimated to cost 197*l.* 1*s.* 9*d.*, actually cost 294*l.* 18*s.* 5*d.* A retiring-place (which was in stock) was erected at Eel Brook Common, and 112*l.* was allowed by the Council for transferring, repairing and erecting it, with a proper water supply; but the accounts of the works committee show that it has cost 179*l.* 19*s.* 3*d.* A shed had to be built at Spring Gardens, which was estimated to cost 70*l.*, and when completed it was found to have cost 113*l.* 11*s.* 2*d.*; and a boundary wall at Cheyne Walk, Chelsea, cost 60*l.* 8*s.* 1*d.*, which was 17*l.* 13*s.* 11*d.* more than the architect says he could have got it done for.

The parks committee reported to the Council that in seven cases in which the works committee did work for them, at an

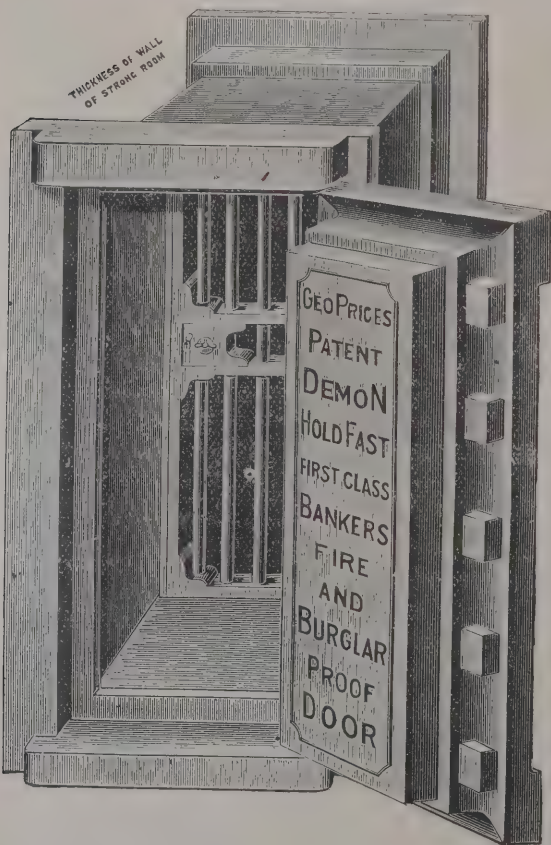
estimated cost of 4,142*l.*, they had cost 5,697*l.* 4*s.*, or an excess of 1,555*l.* 4*s.*, equal to 37½ per cent.

The fire brigade committee reported to the Council that in ten cases, where the architect's revised estimate was 1,148*l.*, it had cost 1,759*l.* 16*s.* 8*d.*, or 611*l.* 16*s.* 8*d.* beyond; and in five other cases, where the estimate was 175*l.*, it had cost 342*l.* 18*s.* 10*d.*, nearly double the estimate, and when questioned on the matter in the Council, the acting chairman of the committee admitted that there were over six hundred similar cases.

These are all cases that have been reported to the Council, and in which there can be no doubt as to the accuracy of the figures. May we not assume that the cases not reported on will tell the same tale, and for that reason have not been reported? There is one instance not yet reported to the Council, in which it was publicly stated in the Council that the building of the artisans' dwellings at Yabsley Street, Poplar, and West View, Greenwich, had cost 7,000*l.* beyond the architect's estimate. These cottages were at first estimated to cost 33,967*l.*, which, by the revised estimate, work out at 45,000*l.*, but which, it is stated, have actually cost over 52,000*l.*

If, as is alleged, the works committee has been such a success, is it not strange that we have not had more than thirty-two jobs reported on out of the large number that has been completed? Seeing that the committee has at the present time over 250,000*l.* worth of work in hand, is it not time that those who have to find the money should bestir themselves and take care that those only are elected members of the Council who will see that the money is carefully and judiciously expended, and that if works are to be done by men in the direct employ of the Council, they shall be done at the same cost as contractors can do the work, and not at the excessive amounts that the works are now costing? When the Council decided to do its own work it was said the contractor's profit would be saved, but the results do not bear out that promise.

As one prepared to verify every one of the statements herein contained, and who can produce the minutes of the Council to bear them out, I feel it is only right that these facts should be made known, so that the ratepayers should not be misled by the statements that have been issued by the Progressives, in which they say, "By doing our own work we are saving money." If they are, let them report on the whole of the works completed, and let the public know the whole of the results, and not rest content with the thirty-two cases they have reported on.



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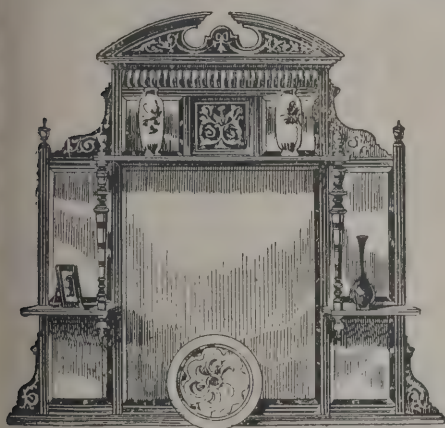
NORTH AISLE OF THE REDEMPTORISTS' CHURCH, PERTH.

MR. HEPWORTH AND CARLISLE.

THE citizens of Carlisle will learn with regret, says the *Carlisle Journal*, that Mr. Joseph Hepworth, who for twenty-five years had been engineer and general manager of the Carlisle Gas and Waterworks, has resigned his appointment. The resignation was tendered on Wednesday evening to the gas and water committee, who had unfortunately no alternative but to accept it. Mr. Hepworth, it appears, is about to join as partner and managing director a large firm of manufacturers of gas-meters, whose headquarters are in Edinburgh, with branches in Manchester and the colonies. He will take up his residence in Edinburgh, where he will continue to act as consulting gas and water engineer, a branch of his profession in which he has attained great eminence. His engagement at Carlisle will terminate in April, and in the following month he will probably take his departure from the city which he has made his home for a quarter of a century. When he came to Carlisle there were two appointments vacant, and he was in some doubt which of the two he would accept. One was the management at Carlisle, and the other was a sub-managership at Cheltenham. After visiting this city he arrived at the conclusion that Carlisle offered more scope for development, and he decided to become a candidate for the appointment in this city. Another engineer was appointed to the sub-managership at Cheltenham, and the manager of the works in that town having shortly afterwards died, the sub-manager was promoted to the vacancy at a salary of 1,200*l.* a year. This incident may perhaps have suggested to Mr. Hepworth that, so far as pecuniary emoluments were concerned, he had made a mistake in casting in his lot with Carlisle rather than Cheltenham, but we question whether in other respects he has had any cause to regret his choice. During his term of office he has trebled the productive capacity of the works, and earned for himself a high repu-

tation among the members of his profession, both as a gas manager and water engineer.

Carlisle had been lighted by gas since 1818; but Mr. Hepworth found the Carlisle works much behind the times in 1870. One of his first reforms was to introduce a simple method of putting out the street lamps, a process which had previously been performed by lamplighters with ladders. This at once effected an appreciable saving of money, and it was the precursor of many improvements of much greater importance. The works then existing were found quite inadequate to meet the growing demands upon them. The quantity of gas delivered in 1870 was 80 million cubic feet, and in the next five years it had increased nearly 34 per cent. Mr. Hepworth in 1875 made exhaustive reports upon the question of extension upon various sites named, including Linton Holme, near the North-Eastern goods station, and produced very elaborate calculations as to probable requirements. The Council determined to develop the works on and near the present site, and Mr. Hepworth took entire charge and superintendence of the new buildings that were then and subsequently erected. Great improvements were soon introduced into the manufacture of gas, its purity and illuminating power were greatly improved, and no opportunity was lost of introducing into the gasworks those economical methods which have been invented in recent years, by which a much larger quantity of gas can be produced from every ton of coal carbonised. While the plant at the works was improved and developed, the mains were overhauled, leakages were prevented and the difference between the quantity of gas made and the quantity consumed was reduced to a minimum (1.64 per cent.), of which any city might be proud. The adaptation of gas to the purposes of cooking, heating and motive power was encouraged with a liberal spirit, and by the adoption of the "penny-in-the-slot" system of gas meters for small houses, the number of consumers of gas for illuminating purposes has been largely augmented. In 1870 there were under 5,000 consumers; in 1894 there were 7,171, or nearly one-half more; 642 gas cookers have been introduced; 1,297 gas fires and heating stoves; 395 gas boiling stoves and 52 gas engines. These are almost entirely new developments of the use of gas. We have not yet mentioned the introduction of the processes by which the residuals have been turned to profitable account. This also was due to Mr. Hepworth, and so rich was the mine of wealth thus tapped that at one time it seemed as if it would pay the gas committee to supply gas at cost price in order that the quantity of residuals available for



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sale at high prices might be increased. The most recent work of importance carried out under his direction has been the extension of the gas mains to Scotby and Wetheral.

As with the gasworks so with the waterworks. The history of the works during Mr. Hepworth's tenure of office has been one of continuous development and prosperity. The works have been enlarged and the profits have been increased notwithstanding the reduction of the price of water to a low level. The filter-beds in Stoney Holme were doubled under his superintendence, without calling in the aid of an engineer from the outside; he designed and carried out the public baths, he took successful steps to reduce the great waste of water, and during the last two years he has been engaged in considering the best means of still further extending the works to meet the growing needs of the city. That great Mosedale gravitation scheme, by which it was proposed to bring water to Carlisle from the upper reaches of the Caldew, proved too costly and too much surrounded by unknown possibilities of compensation to find favour with the public; but we hope that before he relinquishes the appointment which he has filled with so much credit to himself and so much satisfaction to the citizens, he will be able to propound some acceptable scheme for the development of the present works. As a consulting gas and water engineer he has made himself a name in various towns in Cumberland, not to go further afield, and his election to the presidential chair of the Institute of Gas Engineers in 1890, as a preliminary to a visit to Carlisle in 1891, was most popular among the members of his profession. Mr. Hepworth has been a busy man, but he has managed nevertheless to identify himself during his residence in Carlisle with some public movements of an educational and social tendency, such as that of the Pleasant Sunday Afternoon Association and other work in connection with the Charlotte Street Church. The members of that church will join in the general regret that Carlisle is so soon to lose one who has done so much for the city, and who during the process has made himself hosts of friends.

COMBINED DRAINAGE.

A PAPER on "Combined Drainage" was read by Mr. R. Godfrey, engineer and surveyor to the King's Norton Rural District Council, before the Incorporated Association of Municipal and County Engineers on the 18th inst. He

observed that by the Metropolis Management Act, 1855, it appeared that combined drainage was authorised "with permission," and that, therefore, in the future all combined drains could be kept from becoming sewers; but in the Public Health Act, 1875, amended in 1890, there was no provision of that kind, and therefore the interpretation of the Courts, as focused by the case of *Travis v. Utley*, had a far more serious effect on provisional districts than on metropolitan vestries. As the subject was one which was exercising the minds of all municipal engineers, who were practically unanimous in the view that some alteration in the law was necessary, that Association should, in the interests of the country generally, take the lead in an endeavour to bring such pressure to bear on the Local Government Board as would bring about a speedy revision of the definitions of "drain" and "sewer," and so relieve the already overburdened ratepayer of an enormous charge which rightly belonged to the property-owner.

PORT TALBOT, SOUTH WALES.

It has been felt that a dock, with the same depth of water over its sill as at the Cardiff and Swansea Docks, was a pressing necessity for the western portion of the South Wales coalfield. In order to satisfy this want Miss Talbot, the lady of the manor, and her advisers projected a scheme for a first-class coal-port at Port Talbot, for which purpose an Act of Parliament was obtained last session. This scheme comprises a system of railways and a dock, the construction of the works for which is to be commenced forthwith. Geographically the new dock is all that can be desired. It is situated in the midst of what is practically a virgin coalfield, and by means of the railway to be made in connection therewith it will be from twelve to fifteen miles nearer than Cardiff, Barry, or Swansea to collieries having a present output of from 2,000,000 to 3,000,000 tons of coal per annum. The entrance to the dock will be protected by long breakwaters, so as to insure safety to the vessels using the port, whilst the dock itself will be fitted with the best coal-lifts and other appliances for expeditiously and economically loading ships. The engineers to the undertaking are Messrs. James A. McConnochie, P. W. Meik and T. Forster Brown, the contractors being Messrs. S. Pearson & Son, of Westminster.

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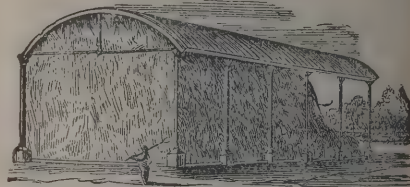
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IMPROVED METHODS OF HOUSE-DRAINAGE IN AMERICA.*

(Concluded from last week.)

JUST a few words on the so-called open arrangement of fixtures. A decided improvement in the character of workmanship has been brought about by the improved method of keeping plumbing fixtures exposed to view. The advantages from the point of view of maintenance of cleanliness and ease of inspection are too apparent to need further discussion. I wish to dwell, however, for a moment, upon one point which seems to be less well understood. In conversation not long ago with one of our busiest architects, he remarked that the open arrangement of plumbing fixtures entailed a largely increased labour on the part of servants and, therefore, was not looked upon with favour by householders. This is, without doubt, true of exposed nickel plated piping. It must not be overlooked, however, that nickel plated work and exposed work are not one and the same thing. You can have one without the other. From a sanitary point of view, a job may be equally well and equally safely done if constructed of lead and afterwards merely painted or bronzed. Where more elaborate or expensive work is desired, the piping may be electro-copper bronzed or finished in oxidised silver, which do not require the constant polishing which nickel finish needs to keep it bright.

Whereas in former years plumbing fixtures were scattered all over the house, necessitating a complex system of plumbing-pipes, and often endangering the health of the occupants by ill-contrived and defective fixtures placed in the bedrooms, the modern practise of architects, and one which cannot be too highly praised, is to confine plumbing-work to the bath-room, to the kitchen, pantry and laundry. The necessary fixtures are placed, at far as the house-plan permits, in vertical groups, and all appliances and the water-closet and slop-sinks in particular are placed in well-lighted and well-ventilated apartments.

There is one mistake, however, which is still frequently committed, to which I beg permission to draw your attention. The mistake to which I allude is the placing of the water closet in the same room where the bath-tub or the wash

basin are located. This is objectionable on æsthetic as well as on practical grounds. It is particularly so in the case of the smaller houses, and in apartment houses with only one bath-room. In more elaborate houses of rich people, where there are several bath-rooms, the separation of the water-closet is not so necessary for practical reasons, but I think that a bath-room with a water-closet can, in all cases, be made much more inviting by contriving an ornamental screen, or a low partition separating the water-closet from the other fixtures. The partition may be lined with marble or tiling, and its upper part may be constructed of open fretwork. I have in mind several exquisitely-finished bath-rooms designed by progressive architects, in which this division of the room was made a successful and greatly-appreciated feature.

Much improvement is noticeable in the selection of suitable and sanitary plumbing appliances.

The objectionable pan-closet is seldom encountered in modern plumbing-work, plunger-closets are out of date, valve-closets are no longer fitted up, and improved water-closet troughs have taken the place of the former privy sink. Wooden laundry tubs are no longer common, because better tubs of non-absorbent material may be obtained cheaply.

As regards the most important sanitary fixture, namely, the water-closet, the number of apparatus of different make and construction is legion. Practically, however, the choice lies between only a few approved types, viz. the flushing-rim long hoppers, which are good but require a large quantity of flushing water, and the improved pedestal short hoppers, the siphon and the siphon-jet closets, and finally the so-called wash-down closets, having a vigorous and direct flush. You may notice that I do not include in this list the wash-out closets, because while I do not wish to condemn them too severely, I cannot bring myself to regard them with much favour. They have several objectionable features, which do not commend them to me as a perfect sanitary fixture. They are, notwithstanding these facts, very popular at the present time. Popularity, however, is not always a just criterion of fitness, for the same thing may be said to have been the case with the Jennings and the Zane plunger-closets, with the Hellyer or valve-closet, &c., all of which are now out of date.

Two points require careful attention where porcelain water-closets are used, one is the floor-joint, which being on the sewer side of the water-closet trap must be made tight. The other is the connection between the piping and the earthenware horns of the bowl. If these are made rigid breakage of

* A paper read at the monthly meeting (December 5, 1894) of the Architectural League, by Wm. Paul Gerhard, C.E., consulting engineer for sanitary works.

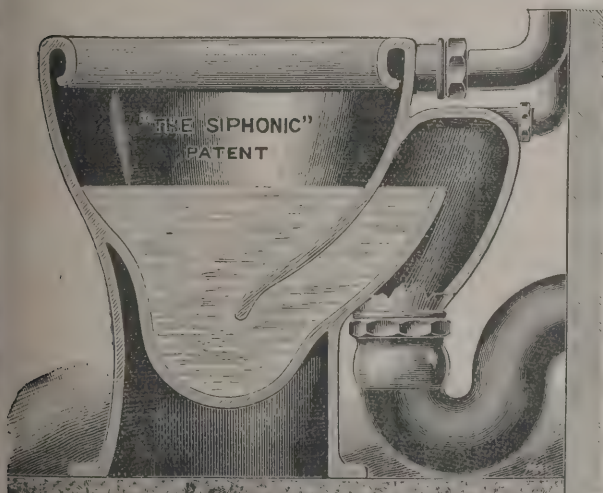
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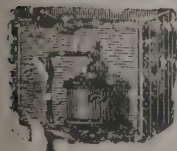
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the earthenware is the result of the slightest settlement of the floor. A flexible connection is, therefore, much to be preferred, and can be obtained with many of the types of closets named.

The limits of this paper do not permit my discussing in detail the requirements of water-closets, and I must pass on to review briefly the other plumbing appliances of houses.

Speaking of wash-basins, we may distinguish four principal types, viz. 1. tip-up basins; 2. chain-and-plug basins; 3. open stand-pipe overflow basins; and 4. secret waste-valve basins.

Tip-up basins are generally condemned, because in their usual form they have objectionable features. If the receiver could only be arranged so that it would not become foul, or that it was readily accessible for cleaning, this type of basin would have many merits. It is, without doubt, very convenient in use, has no concealed overflow, no chain and plug, is rapidly emptied and flushes its waste-pipe and trap well at each discharge.

The objections to the second type, the common chain and plug basin, are too well known to need further comment. It is proper, however, to state that there has recently been put upon the market some modified forms of this type, which I consider great improvements upon the ordinary type. One is a syphon basin which empties rapidly, and flushes its overflow at each discharge. The overflow channel is so shaped that when the plug is inserted in the bottom of the bowl and the same filled with water, the overflow is trapped. In office buildings and in hotels, where a stand-pipe overflow basin or a bowl with waste valve is too expensive and too complicated for general use, the syphon form of basin has much to recommend it. The other improved form is a chain and plug bowl in which the waste outlet has been greatly enlarged, and which has the usually hidden overflow channel made much shorter and accessible by means of a removable strainer.

The third type of basin has an open stand-pipe overflow, and there are numerous modifications of the device for raising the stand-pipe. From a sanitary point of view this type has, undoubtedly, the greatest merit of all forms, still my experience has been that the general public is hardly sufficiently educated in sanitary matters to appreciate its merits. By many this form of basin is utterly condemned on account of its odd shape and appearance. The favourite form of basin is just the one which has the most objections from the hygienic standpoint, namely, the bowl with secret waste-valve. To discuss its objectionable features in detail would lead us too far.

Regarding that valuable fixture for personal cleanliness, the

tub or bath-tub, with its various modified forms, such as the foot-tub, the sitz-bath, the hip-bath, the bidet, &c., I would state that tubs of wood lined with copper are less used than formerly in private houses, probably because they always require some sort of wooden casing, and also because they lose their bright appearance in use. Enamelled iron tubs, standing free from the wall and raised from the floor, constitute a satisfactory sanitary fixture, which is surpassed by the beautiful all-porcelain bath-tubs. Both kinds of tubs are now obtainable with a glazed roll rim, thus doing away entirely with all woodwork. I ought, perhaps, to mention in this connection that a great improvement in the manufacture of American earthenware has recently taken place, and that it is now for the first time possible to obtain porcelain bath-tubs made in this country. In regard to the appliances used for holding water in the bath-tub and for emptying the same, much of what I said of wash-basins applies here. In this matter I may appear to you old-fashioned, when I state that my decided preference is for an open stand-pipe overflow.

For baths in public institutions, for baths in factories, and for people's baths there is a growing tendency to discard the tub-bath in favour of the rain or spray bath, which is greatly superior from a sanitary point of view, besides having many economical advantages.

Slop-sinks and housemaids' sinks are obtainable in a variety of serviceable forms, most of them excellent from the sanitarian's point of view. I would only remark that a flushing cistern is quite as essential in the case of a slop-sink as in that of water-closets. An ingenious and novel arrangement consists in a slop-sink which flushes itself automatically each time slops are emptied into it.

Kitchen sinks are likewise obtainable in a variety of materials. This fixture is much improved by changing the dribbling stream passing through its waste into a quick and effective flush. Attempts in this direction have been made with some success, and the devices employed are certainly worth considering. Incidentally, the question of avoiding the kitchen grease nuisance is thereby solved, in a better way, to my mind, than by the employment of grease-traps at the sinks, which invariably constitute a nuisance, are usually forgotten or neglected, and are not to be recommended. I must content myself with a mere allusion to the subject.

Of urinals it is only necessary to mention that in private houses their use is not to be encouraged, as the fixture is very difficult to keep clean. In offices and in public buildings, such



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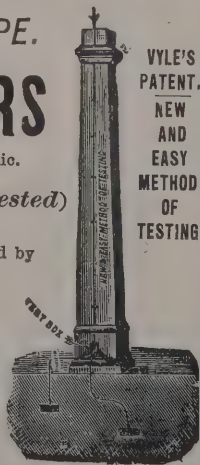
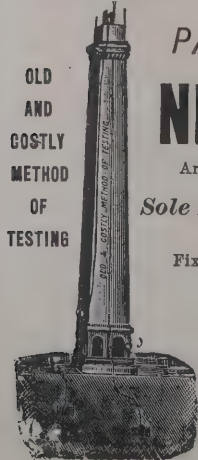
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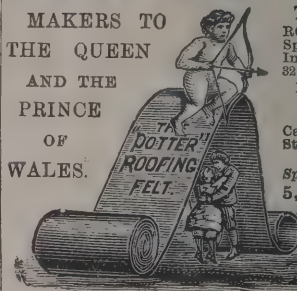
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as hotels, railroad stations, courthouses, &c., the fixture is a necessity, and great attention is required not only in the fitting-up but in its maintenance. The projecting lip of porcelain urinals seems to me to be of doubtful advantage. One point in the fitting-up of the fixture is worthy of mention: the bowls are generally set up too high from the floor-slab. I find it is better to set them at a height not exceeding 22 inches from top of lip to floor-line, instead of 24 to 26 inches, as is customary. The floor-slab is thereby kept more readily free from drippings.

In fitting up plumbing fixtures, the chief aim should always be the avoidance of woodwork at and around them. All fixtures should stand free from the walls, and be accessible on all sides. Even the seats of water-closets are now attached directly to the bowl; the closet thus stands absolutely free and detached from the wall, and the entire fixture can be reached for cleaning and for repairs. In one respect, however, modern plumbing fixtures are open to considerable improvement: I refer to the undesirable noisiness accompanying the flush and the discharge of the fixtures. This problem, as experience teaches, is not easily solved.

The time at my disposal permits only a brief allusion to the testing of plumbing-work. All work should be tested before acceptance, as knowledge of the safety of the plumbing-work can only be obtained in this way. I regret to say that I have found only very few mechanics doing plumbing who apply to their work any test, except where this is specially insisted upon by the architect or the engineer. To my mind, it is one of the most important duties which architects owe to their clients to see to it that all work is tested. For new work we have the water test and the air-pressure test. This should include not merely the main horizontal lines and the vertical stacks, but likewise all the branches and the brass ferrule joints. The finished work should be tested by the peppermint or by the smoke test, which help to show imperfections in the joints of nickel-plated piping and at the floor-joints. In the inspection of old work, the water test, which is the best test, cannot, for obvious reasons, be applied, and here the smoke test, or the test with oil of peppermint, intelligently applied, give valuable indications as to the condition of the work.

A great step forward would be made and plumbing-work vastly simplified by abolishing, or at least modifying, the trap-vent system.

There are at present two quite different methods of arranging the system of trapping the fixtures in a building.

In the one system, which is in accordance with the majority of plumbing regulations, and is the one at present enforced in New York City, all traps must be back-aired or vented. We thus obtain a duplicate system of pipe-lines, the work is complicated, more expensive and may become more unsafe, on account of the greater number of pipe joints and the possibility of "by-passes." The other system—the one-pipe system, as we may call it—is distinguished by its greater simplicity, economy and, as I maintain, by its greater safety. This method substitutes non-siphoning traps or anti-siphon trap attachments for the cumbersome method of back-airing. In this system all main soil and waste lines must be quite as fully ventilated by extending them the full size up to the roof as in the usual method. All fixtures are located directly at the lines carried up to the roof, or within a very few feet of the same. Siphonage of the traps is impossible under the ordinary conditions, quite as much so as in the back-airing system. You will find the majority of plumbers opposed to the new system; for while it simplifies the work, it reduces the amount of piping used and thereby the cost of the work. There is also much prejudice against the proposition, many plumbers seeming to fear that by putting themselves openly on record as in favour of it, they would by others be considered as not quite up to date in plumbing matters. The fact remains undisputed—and I have demonstrated it in many cases in my practice—that the new method is, at least, quite as safe as the old one. I venture to predict that in a very few years plumbing laws will be so modified as to leave it optional with the owner or architect of a building which method he will adopt.

This leads me to say a few words in regard to plumbing rules and regulations, in particular of those in force in New York city. Further advancement in plumbing requires the revision and improvement of the plumbing laws of the Building Department. Far be it from me to underrate the good which the present rules have accomplished in the past. Ours is not, however, an age in which we can at any time afford to stand still. Constant progress is made in every department of construction, and the researches of the practical sciences are everywhere utilised and embodied in actual practice. Let us hope to see soon a revision of our plumbing laws. Be it remembered that the plumbing rules of our metropolis are being largely copied by other cities. We cannot afford to fall behind in this matter. Our present rules are too indefinite in many details; they are much too arbitrary in others. Take, for

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instance, the question of sizes of drain-pipes, of soil-pipes, of vent-pipes, the diameter of traps, &c. There is certainly now sufficient practical experience available to lay down more definite rules as to sizes. The rules should also in the future prohibit fixtures which sanitary science has long ago recognised as being absolutely bad. Pan-closets, wooden sinks and wooden wash-tubs should be discarded, and privy sinks should no longer be tolerated.

Before leaving the subject of interior drainage I wish to consider for just a moment the prevailing practice of doing plumbing-work. It is without doubt feasible to have plumbing-work done by day's work by a contractor of known integrity, at a certain agreed commission or profit on the net cost of labour and material without thereby unduly increasing the cost of the work. Still, as a rule, the owner prefers to make a contract for a lump sum or stated figure. In that case the recent practice, particularly in the case of high office buildings, of putting the plumbing—and for that matter the heating and power plant, the electric work, and the elevator machinery—in the builder's general contract, for a consideration which usually amounts to much more than the fee of experts who would plan and superintend the work in the owner's interest, cannot be commended. There is not, to my mind, a single feature of merit in it, and there are, on the other hand, good reasons why these branches, which comprise the domestic engineering work of buildings, should be kept separate and under the direct control of the architect or the mechanical engineer or sanitary engineering expert who may be associated with him.

In conclusion, let me say a few words about the outside drainage and final disposal of the sewage, particularly of country houses not within reach of sewers. These are questions which rarely concern the architect directly, but about which it is nevertheless useful for him to keep informed.

In the case of city houses the outside drainage is apparently a very simple matter, consisting merely in the continuation of the house-drain to the public or street sewer. Still, even the sewer connection requires attention, as is proved by a recent case which happened on the upper west side of this city, where a builder and his plumber connected a whole row of dwellings to the pipe-sewer in the street by merely breaking holes into the sewer and sticking the house-drains through it.

The final disposal of the sewage from habitations becomes a very difficult and sometimes troublesome matter in the case of country and suburban houses not within reach of sewers.

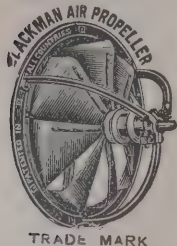
The purity of the local water-supply must be maintained, the contamination of the soil and likewise the pollution of the air must be prevented at all hazards. To accomplish this, the disgusting and health-menacing cesspool and the privy nuisance must be done away with. Bad as a single cesspool is, the evil is only aggravated by the method sometimes pursued of having one cesspool for the water-closet wastes and another for the kitchen-sink wastes, or by having a series of cesspools with connecting overflows.

Two methods of sewage disposal have been devised by engineers which offer a successful solution of the problem. One is the system of sub-surface irrigation, the other the disposal of sewage by irrigation over the surface. Inasmuch as the chief requirements are that sewage be disposed of not alone without injury to health, but also without offence to sight or smell, it is not often practicable to run the sewage over the surface of the ground near the house. Where plenty of land is available and located at such an elevation that sewage can be conducted to it by gravity, surface-irrigation is by far the best, the cheapest and the simplest mode of disposal.

The other system, the sub-surface irrigation system, has been in successful use in many country places. It has often been described and illustrated, and in a paper like this it is out of the question to go into details. The chief features of this system are the following:—

1. Carry the sewage from the house in a tight pipe conduit leading to a sewage or flush tank.
2. Collect the sewage in a double-chambered tank, the first chamber being intended to retain the solids and kitchen grease, while the second and larger tank receives the liquid sewage by a deeply-trapped overflow from the first chamber.
3. Discharge the liquid sewage once or twice a day by means of an automatic siphon into an outlet pipe leading to the sewage field.
4. Distribute the sewage by means of a main conduit with laterals into a system of absorption drain-tiles, laid with open joints in trenches 12 inches deep, covered up with earth.

I will not describe the details of the system. I wish to warn you, however, against having such work done by contract. Frequently have I been asked by clients and by architects to undertake sewage-disposal contracts, but I have always declined to do so. I know that others undertake such contracts, but the results are seldom entirely satisfactory. Often the mistake is made of laying an insufficient number of absorption tiles, with the result that after a season's work the field becomes



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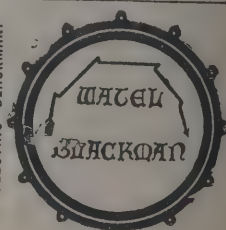
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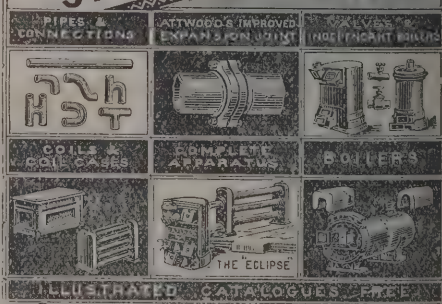
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overcharged with sewage. I also find sewage-disposal systems laid out by others giving trouble because the tiles are laid with too steep a grade, in which case it invariably happens that the bulk of the sewage runs to the lowest end of the field, where it often breaks out on the surface. In other instances, again, I find the distributing tiles laid 2, 3 and sometimes even 4 feet below the ground surface. This mistake arises from a lack of knowledge of the principles of the system, which require the sewage to be discharged into the upper well-aerated layers of the soil or the sub-surface, where the action of the bacteria converts the sewage and the particles of organic matter attaching to the earth into harmless elements.

A bad lay-out of the distributing tiles invariably results in failure. Sometimes the system proves unsuccessful from the omission of the first or intercepting chamber, in which case the tiles become choked in a short time. Insufficient attention to the flush-tank is another frequent reason why the method fails to give satisfaction. Owners of country houses, after adopting this method of disposal, generally make the mistake of assuming that the same is automatic and hence needs, after completion, no further attention. The fact is that nothing is automatic in the system except the siphon for emptying the flush-tank, but every part of the system, including the siphon, needs attention and intelligent care and occasional cleaning.

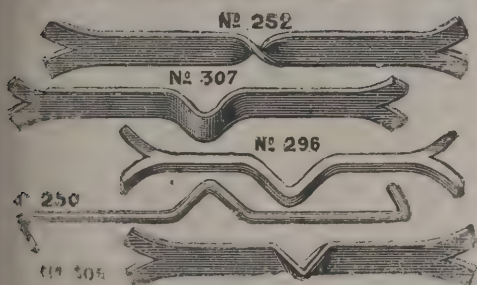
As regards the flush-tank, it may be either an open or a closed tank, the latter being preferable in all cases where the flush-tank must be placed near the house. The open tank, if at a distance from the house, is better, because it is more readily accessible and easier to clean. The tank may be circular in shape or else oblong. It is generally built of brick-work, lined with Portland cement. Colonel Waring, who introduced this system from England, has suggested lining such open sewage-tanks with enamelled-face brick or with marble. I agree with him that this is quite desirable on the ground of greater cleanliness. But in my own practice I have not been able to meet clients who were willing to incur the extra expense involved, and where I am associated with architects in such work I find they prefer putting marble or slate or enamelled-face brick where it will show to better advantage.

There are a great many other things which I would like to bring before you if time permitted. In closing this paper I thank you for your courteous attention, and trust that some of the points brought up may be new to you, though I fear that to such a progressive body of architects I have but retold an old story.

LEEDS GASWORKS.

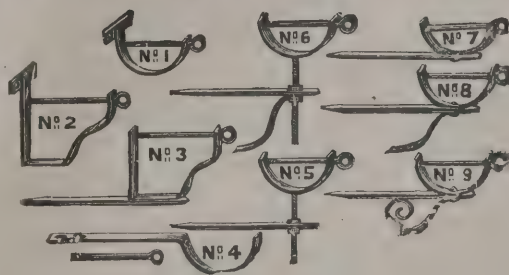
It will be interesting to the ratepayers to know, says the *Leeds Mercury*, that the managers of the Meadow Lane, the York Street and the New Wortley Gasworks have received strict instructions from the Corporation gas committee to keep up the illuminating power of the gas to a high standard. Within the last few months there has been a considerable improvement in this respect, and, in fact, taking the whole of last year, the quality of the gas supplied from the Leeds works compares very favourably with that manufactured in other towns. The standard agreed upon between the managers and the committee is 18 candle-power. The tests last week showed an average of 18.17 candle-power. This, however, though much above the limit, can hardly be taken as a fair example, for in passing through frosted pipes the gas slightly loses quality. The coal contracts, which do not terminate until autumn next, were let at a reduction as compared with the previous year. Since the letting of those contracts the committee have received dozens of letters from colliery proprietors and others offering to supply them at still lower prices. From this it is natural to infer that business has not of late been very brisk at the collieries, and that stocks are large. At the Meadow Road Works improvements are about to be carried out (subject, of course, to the consent of the Council), which will cost upwards of 3,000*l*. The office accommodation at these large works is at present far from being convenient, whilst the workshop and stores accommodation is distinctly inadequate. All three of these defects the committee propose to remedy. The new offices will be erected on a part of the property bought for the widening of Meadow Lane, to which thoroughfare they will have a handsome frontage. At the new Wortley Works also improvements are suggested. The purifying plant there is not equal to the amount of work it should get through, and plans have been ordered to be prepared for a new apparatus. Subject to the approval of the Council, the committee also will purchase a plot of land adjoining these works from Messrs. Greaves & Holmes, to be used if necessary for extension purposes in the future. The question of appointing a successor to the late Mr. Lupton, who occupied the position of gasworks superintendent and chief clerk to the committee, has been the subject a long debate amongst the members, who have finally resolved to advertise for some one to fill the vacancy at a salary of 300*l*. per annum. To define what the duties of the new official will be is a difficult matter. In fact,

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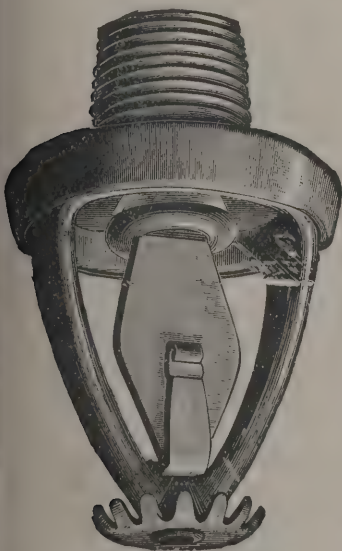
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it is doubtful whether at present they could be defined. At the time the late Mr. Lupton became a servant of the Corporation, the accounts of the different Corporation departments were in the hands of different individuals. When the Municipal Buildings were erected the Council resolved that all financial matters should be controlled by the city accountant and his staff. To this rule one exception was allowed, and that had reference to the gas department. Mr. Lupton had been connected with the gasworks long before they became the property of the Corporation, and being conversant with every commercial detail of the undertaking, he was asked to retain the control of the finances. Now that the committee have lost Mr. Lupton's valuable services they have determined to readjust matters, and Mr. Derry (the city accountant) is in future to have charge of the gas accounts, and the new official, we presume, to act as superintendent of the gasworks. It is to be hoped that whoever is chosen to the new position will have a thorough technical knowledge of gas manufacture, as well as be a man of first-rate commercial capacity. A servant of the public cannot be too competent.

MANCHESTER ASSOCIATION OF ENGINEERS.

Two papers were read before this Society by Mr. G. H. Firth and Mr. D. Selby-Bigge on "Electricity as the Future Motive Power in the Textile Industries." Sir Leader Williams presided. Mr. Firth said that there was nothing of more importance in our various manufacturing concerns than the question of the transmission of power. Mechanical power was now obtained and distributed in a variety of ways, and the principal methods of transmitting it until recently were by shafting, wheel-gear, belting and ropes. But when they took into account the many objectionable features connected with these systems they would see that the day might come when these good servants must yield to a more efficient servitor. The paper next dealt with the disadvantages inseparable from the present means of transmitting power and with the unavoidable losses from friction, which was described as a "mechanical octopus." The remedy for all this waste was electricity, and the paper proceeded to consider the best means of transmitting that power. The best economical method was to have a central generating system, from which wires should be led off to other distributing centres, the current to be led off from these points to the various motors, which should be attached as closely as possible up to the point of application of

the energy in a machine. Being unable as yet to get our energy in a more direct way than by means of water, gas or steam power, the generating system was nothing more than the usual steam-engine or boiler or other motor with which we were now familiar. There was one great difference, however, not to be lost sight of, and that was that in the electrical system we usually coupled up direct on to the crank shaft of the engine, which enabled us to run at a speed usually only attained on our second or third motion shafts in the ordinary way, whereby we were enabled to use lighter engines at much less first cost for the power generated, and also at a considerable saving in space occupied. In the majority, though perhaps not all, of our textile industries, a great economy over present methods of using power might be effected, and the future alone would disclose to what extent we should have profited by the adoption of the latest development of industrial progress. The paper of Mr. Selby-Bigge was devoted to the consideration of how electricity could be generated and transmitted for the purpose of driving a cotton mill. When large water-power was available the mill might be driven with economy in a manner already successfully adopted in America—viz., by means of motors geared, or driving by belt on to the various line shafts throughout the mill. Where a good reliable water-power existed within a reasonable distance the method of line shaft driving by electric motors would be found to be an economical and advantageous one, but in the English mill district unutilised water powers of importance were few and far between, and one would almost always be brought face to face with steam power. In this part of the country gearing, belting, pulleys and shafting had been brought to a high state of perfection, and it was not by improving on these that the writer looked for saving, but to the radical change of abolishing them altogether. The upkeep of an electric power instillation throughout a mill would certainly not exceed 5 per cent. of the capital outlay, and he thought that in practice it would not exceed 3 per cent. Such machines as carding engines, &c., could all be driven electrically by motors embodied as part of the machines themselves.

At the third sessional meeting of the East of Scotland Engineering Association, held at 5 St. Andrew Square, Edinburgh, Mr. William Simpkins, B.Sc., C.E., president, in the chair, Mr. James H. Anderson read a paper on "Piled Foundations for Engineering Structures."



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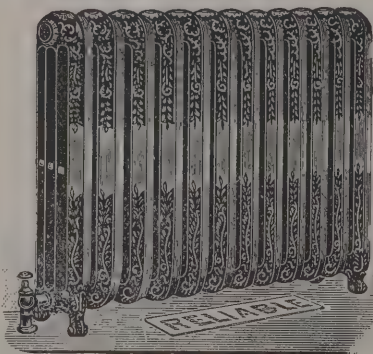
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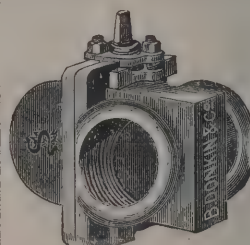
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THE LONDON FIRES OF 1894.

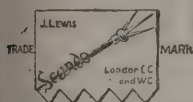
THE annual report made by Captain J. Sexton Simonds, the chief officer of the Metropolitan Fire Brigade, states that during 1894 the number of calls for fires or supposed fires received was 4,111. Of these 845 were false alarms, 205 proved to be only chimney alarms, and 3,061 were calls for fires, of which 151 resulted in serious damage and 2,910 in slight damage. These figures refer only to calls which involved the turning out of firemen, fire-engines, fire-escapes, &c. The fires of 1894, compared with those of 1893, showed a decrease of 349; or, compared with the average of the past ten years, an increase of 521. The number of fires in which life was seriously endangered during the year was 141, and the number of those in which life was lost was 73. The number of persons whose lives were seriously endangered by fire was 204. Of these 122 were saved and 82 lost their lives. Of the 82 lost 56 were taken out alive, but died afterwards in hospitals or elsewhere, and 26 were suffocated or burned to death. In addition to these cases, 116 persons are known to have been in more or less jeopardy at fires attended by the brigade during the year. In 27 cases mineral oil lamps exploding or being upset caused 32 deaths; six children lost their lives through playing with fire or matches; four deaths were caused by candles; two by clothes coming in contact with fires in grates; two by sparks from fires; one by light thrown down; one by intoxication; one by vapour of spirit becoming ignited; one by a fire at a xylonite factory; and two by explosion of domestic boilers during the severe frost in the beginning of the year. In 26 cases, in which 30 lives were lost, the causes could not be ascertained. The number of calls for chimney-fires was 1,524. Of these 452 proved to be false alarms and 1,072 were for chimneys on fire. In these cases there was no attendance of engines, but only of firemen with hand-pumps. The total number of calls during the year, including those for actual fires, supposed fires, chimney-fires and supposed chimney-fires, was 5,635, or nearly 16 a day, all of which were attended by firemen with suitable appliances. Of the 845 false alarms received during the year, 384 were malicious calls sent through the fire-alarm call posts. In 11 cases the persons who gave the alarm were caught and punished, and ten persons were detected in the act of breaking the glass in the call points. The quantity of water used for extinguishing fires during the year was over 48,000,000 gallons, or nearly 215,000 tons. Of this quantity about half was taken from the river, canals and docks, and the remainder

from the street pipes. During the year there were six cases of late attendance of turncocks and three of short supply of water, making nine cases in which the water arrangements were not altogether satisfactory. There has been latterly a marked decrease in the number of cases in which the water arrangements at fires were unsatisfactory. Only five years ago the number of cases was 28, whilst ten years ago it was as high as 43. In addition to attending fires, the brigade kept 170,000 watches of twelve hours each, made 92,000 hydrant inspections and 108,000 fire-plug tablet inspections, maintained all the machinery and appliances of the establishment in working order, wrote many thousand reports and letters, and carried on a variety of other work.

The present strength of the brigade is as follows:—Fifty-seven land fire-engine stations, four floating or river stations, 56 hose-cart stations, seven hose and ladder truck stations, 200 fire-escape stations, nine steam fire-engines on barges, 51 land steam fire-engines, 78 6-inch manual fire-engines, 17 under 6-inch manual fire-engines, one hose tender and escape, nine hose and ladder trucks, 116 hose carts and reels, 35 miles of hose, eight steam tugs, 13 barges, 12 skiffs, 225 fire-escapes, seven long fire ladders, nine ladder vans, two trucks with ladders, two trolleys for engines, 12 hose and coal vans, six traps for visiting, one stores van, five waggons for street duties, 10 street stations, 148 watch boxes, 791 firemen, including chief officer, second officer, superintendents, and all ranks, being one man short; 20 men under instruction, 16 pilots, 75 coachmen, 137 horses, 81 telephone lines between fire stations, 57 alarm circuits round fire stations, with 565 call points, 20 telephones to police-stations, one telegraph to public and other buildings, 81 telephones to public and other buildings, seven bell-ringing fire-alarms to public and other buildings, and one speaking-tube to public and other buildings. The number of firemen employed on the several watches at the stations and with the various appliances of the brigade distributed throughout the Metropolis is at present 111 by day and 359 by night, making a total of 470 in every twenty-four hours. The average number of men available for general work at fires by night is 360. The number of accidents to members of the brigade recorded during 1894 was 115, but none of these were fatal.

As regards the causes of the fires during 1894, the report shows that 134 were due to candles, 86 to children playing with matches, 46 to children playing with fire, 99 to defective chimneys, 284 to gas explosions, gas brackets, gas escapes, &c.,

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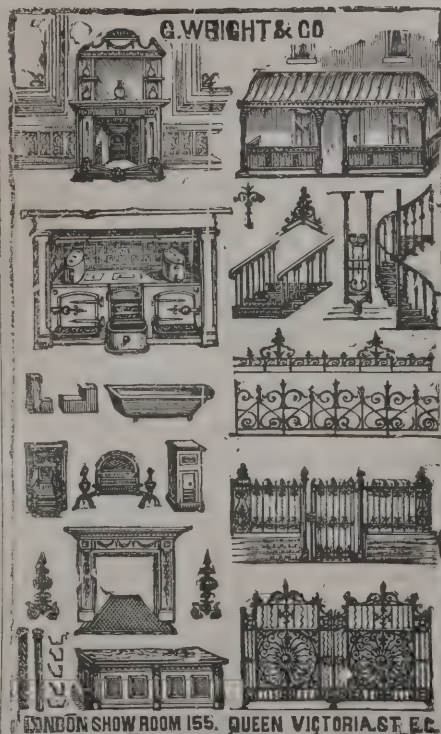
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474 to mineral oil lamps, 276 to thrown-down lights, and 179 to sparks from fires. "Arson" is responsible for one fire, and incendiarism for two. The causes of five fires are returned as doubtful, and in 863 cases the cause of the fire is "unknown."

NILE IMPROVEMENTS.

ON Friday evening Sir Colin Scott Moncrieff read a paper on "The Nile" at the Royal Institution. He said that if an Egyptian were to lecture to his countrymen about the river Thames, and were to begin by informing them that he had never been above Greenwich he might be looked upon as an impostor, and perhaps he (the lecturer) was not much better, for he had never been higher up the Nile than Philæ, or the First Cataract. The whole distance by river from the Victoria Nyanza to the sea was about 3,500 miles. It might not be easy to derive any clear impression from the bare recital of mileage, and he would try to convey an idea of the length of the Nile in other ways. Standing on the bridge at Cairo, he used to reflect that he was just about half-way between the source of the Nile and the White Sea, north of Russia; or, to put it in another way, if they could suppose a river crossing the English Channel, and that the Thames should find its outlet near the Euphrates in the Persian Gulf, that river would be about as long as the Nile. Among the important services that a great river rendered to man, the Nile nobly performed the first, that of carrying off to the ocean the surplus water that fell from the skies, but with this enormous qualification, that it transported the water from tracts where there was too much, and carried it free of cost, not to waste it in the sea, but to bestow it on tracts where it was of priceless value. For most of its course the Nile fulfilled the duty of furnishing a highway through the land. Excepting a few very rude wooden wheels in the Fayun, he did not know through all the annals of the past of a single water-wheel ever turned by the power of the Nile. But that power existed to an almost unlimited extent, and might they not prophesy that some day in the future, when the long stretch of Nubian cataracts had fallen into civilised hands, and when they knew how to transmit electric energy with economy, wealth might be drawn for Egypt from its chain of barren cataracts. The unique position of the Nile was due to the benefit it conferred on Egypt in turning it from a desert into the richest of agricultural lands, supporting with ease a population of about six

hundred to the square mile. Herodotus truly said, "Egypt is the gift of the Nile." What would it mean to the English farmer if he knew exactly when it would rain and when it would be sunshine? When the Irrigation Department of Egypt was properly administered the Egyptian farmer possessed this certainty, and he had this further advantage, that it was not merely water that was poured over his lands, but during nearly half the year water charged with the finest manure. Yearly the phenomenon of the rise of the Nile presented itself, and with the most marvellous regularity. In May 1883 he took charge of the Irrigation Department in Egypt, and soon had the inestimable advantage of being joined by a band of the most indefatigable, energetic and able engineers with whom it was his happiness to work for the next nine years. He could not speak too highly of his colleagues—men who knew their work and did it, who kept constantly moving about in the provinces, badly lodged, badly fed, and denied all domestic comforts. Their first great work was the restoration of the Barrage, the dam built by Mehemet Ali at the bifurcation of the Nile, about twelve miles north of Cairo. It was a happy time to begin reforms when things were at their worst, and when every movement must be an improvement. The reformer, moreover, who had a staff on whom he could absolutely rely, and who had behind him such a strong, patient, painstaking and absolutely honest man as Lord Cromer, and who was not pestered by people who thought that they knew more than he, and insisted on giving advice, was in an exceptionally fortunate position. These works were finished in June, 1890, at a cost of about 800,000*l.*, and the annual increase of the cotton crop, even at the present very low rates, was never less than two and a half millions sterling, which had not been a bad investment for Egypt. The question of drainage had been thoroughly taken up. Twelve years ago it might be said that there were no drainage channels in Egypt; two years ago there were about one thousand miles of such channels. In 1884, when the expedition up the Nile was first being considered, he was asked by the General Officer commanding in Egypt whether he thought there was any possibility of the Mahdi diverting the river in the Soudan and depriving Egypt of its water. A Government official had no business to talk politics, and the Royal Institution was no place for politics, but he might be allowed to point out an evident enough fact, that the civilised possessor of the Upper Nile Valley held Egypt in his grasp. At this moment the Italians were on the eastern edge

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of that valley, a nation who, he must say, had been consistently most friendly to us in Egypt. Supposing that they occupied Khartoum, the first thing that they would naturally and very properly do would be to spread the waters of the Lower Nile over the Soudan, and no nation in Europe understood irrigation so well as they. What would then become of Egypt's cotton crops? They could only be secured by a series of the most costly dams over the river, and the fate of Philæ would surely be sealed. But more than this—a civilised nation in the Upper Nile Valley would surely build regulating sluices across the outlet of the Victoria Nyanza, and control that great sea as Manchester controlled Thirlmere. This would probably be an easy operation. Once done, the Nile supply would be in their hands; and if poor little Egypt had the bad luck to be at war with this people on the upper waters, they might flood the country or cut off her water supply at pleasure. Was it not evident, then, that the Nile from the Victoria Nyanza to the Mediterranean should be under one rule? That time was, perhaps, far off. He concluded by giving them the assurance, to which he challenged contradiction, that at no time in the long history of Egypt—under Pharaoh or Ptolemy, Roman, Arab or Turk—had the people of the country been so prosperous or so justly ruled as during the last nine years.

PROPOSED LONDON IMPROVEMENTS.

THE improvements committee of the London County Council have prepared a report in which they state that for some time the question of the formation of an adequate northern approach to the Tower Bridge from Whitechapel High Street has engaged their serious consideration. Since the opening of the new bridge it has become apparent that the existing northern thoroughfares are altogether inadequate for the increasing traffic, and that the formation of a direct thoroughfare for the traffic to and from the northern and north-eastern districts is most necessary, and cannot be any longer postponed without serious inconvenience to the public. They have resolved to submit to the Council a scheme for a street, 60 feet wide throughout, from Tower Hill to Whitechapel High Street, by way of Mansell Street. The estimate of the officers as to the net cost of the proposed street is—for works, 74,000*l.*; for property, 276,700*l.*; giving a total of 350,700*l.*, from which has to be deducted an estimated sum to be paid by the City Commissioners of Sewers of 31,525*l.* The committee are of opinion

that the proposed northern approach to the Tower Bridge is an example of a county improvement which will add an increased value to property over a wide area, a value which will continue to increase up to a distant future. They have therefore decided to recommend that part of the cost of the proposed street should be met by a charge upon owners of property benefited, in accordance with the principles laid down in clause 36 of the London County Council (Tower Bridge Southern Approach) Bill. Plans of the area benefited will have to be deposited in Parliament, and notices will have to be given to persons affected. The number of persons of the labouring class who would be displaced by the proposed street is about 341. The committee recommend that powers be sought in the first session of Parliament in 1896 to enable the Council to construct the new street.

The committee further report upon an application of the City Commission of Sewers for a contribution towards the cost of certain proposed improvements at Upper Thames Street. The Commissioners have for many years past, as opportunities have occurred, widened Upper Thames Street, and the Metropolitan Board of Works for the most part contributed half the net cost. The Commissioners now propose to set back certain premises at an estimated cost of 37,500*l.*, and they have inquired whether, having regard to the importance of the proposed improvements, the Council would be prepared to contribute to the cost. Upper Thames Street is in some places but 21 feet wide, and by setting back the premises in question it is proposed to make the street of a uniform width of 35 feet. The committee have come to the conclusion that the improvement is a work of sufficient general advantage to London to justify the Council in contributing one-third of the cost. They therefore recommend that the Council take that course on condition that the contribution does not exceed 12,500*l.*

Both the above reports will be submitted to the Council at its meeting on February 5 next.

THE EARL'S COURT WHEEL.

ON Monday, at Brompton County Court, before his Honour Judge Stonor, the case of *Gue v. Bassett* was heard. The plaintiff, Mrs. Gue, widow of the late Walter Gue, sued Mr. W. Bassett, a contractor, of Westminster Bridge Road, for damage caused by the death of her husband while engaged on the great wheel at Earl's Court Exhibition. The damages

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claimed were 350%, being three years' wages. The deceased was employed at Earl's Court Exhibition up till September 27 last (when he met with his death) as a workman on the axle of the wheel, 150 feet from the ground. This was supported by large columns sloping inwards, and at 5 o'clock P.M. on September 27 the order was given to stand clear for the wheel to revolve. Before the wheel could turn Gue had to be let down in his basket from the axle in order to take off a luff rope, which he did, and after doing so, it was alleged on behalf of the plaintiff that he had to get out on the nearest girder, cross over two narrow boards which were under the sloping columns in order to get to an iron ladder, and ascend again. In crossing these boards he had to bend back, and in doing so he fell and was killed. Mr. Lawless, on behalf of the plaintiff, alleged negligence, these boards being, he contended, utterly improper for the purpose; they were too narrow and were dangerous. The jury found for the plaintiff for the full amount claimed.

A NEW STONE COMPANY.

COVE, KIRKPATRICK, QUARRIES, LIMITED, is the title of a new local company which has just been formed, with a capital of 10,000l.; for the purpose of working the valuable and celebrated red and white stone quarries at Cove, near Kirkpatrick, Carlisle, the property of the Hon. Mrs. Greville Nugent. The extent of the quarry ground is nearly a mile in length, by the side of the river Kirtle. The white stone from here, lying on the east side of the river, was the material with which Eden Bridges, Carlisle, was built at a cost of 80,000l., from designs by Robert Smirke, R.A. The red stone lies on the west side, on the same range of land as the Coveshill Quarries. The west side was chiefly worked by the late Mr. Thomas Nelson, contractor, of Carlisle, for Silloth dock and railway, and many other large works which he had in hand. The present works will be connected by a siding from the Caledonian main line, worked by a small locomotive engine, and a railway laid to connect both sides of the river, so as to give plenty of quarrying ground, as the stone is very abundant, and will be easy to get. By the articles of association the company have power to work other quarries, to work brick and tile works, and to act as stone merchants, &c. London will be one of the chief markets. A large depot wharf will be kept there, and chiefly supplied by shipping, which gives a great advantage in carriage where a quantity

can be stocked. The first directors' meeting was held on the 18th inst. at the London office, 14 Great Winchester Street, E.C., when there were present the following gentlemen:—The Viscount Parker, Mayfair, London (chairman); Mr. Thomas Charteris, Westminster; Mr. James Crombie, Ramsay Road, S.W.; Mr. W. A. Bromwich, Kensington Square, W.; Mr. John Beaty, Harraby Green, Carlisle; and Mr. Alan B. Crombie, Dumfries. The bankers are the Cumberland Union Bank, Carlisle, and their London agents; the solicitors are Messrs. Angove & Bromwich, Winchester Street, London; and Mr. J. A. Bushel, 14 Great Winchester Street, E.C., is the secretary.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 846. Robert Phillips, for "Improvements in automatic flush tanks for sanitary and like purposes."
- 869. Charles George Arthy, for "Improvements in locks."
- 908. Thomas Wilfred Woodhouse, for "An improvement in the syphon cisterns used for flushing water-closets."
- 926. George Ernest Holloway, for "Improved ventilating grate for drains and the like."
- 936. Alfred Platt, for "Ceiling protector and ventilator."
- 937. Johann Wilhelm Ludwig Rohde, for "Improvements in combination window-sash fasteners and draught excluders."
- 984. Charles James Phillips, for "Fasteners for doors, sashes, frames, &c."
- 1059. Sidney Herbert Baines, for "Improvements in sliding window-sashes."
- 1092. Charles Major, for "Improvements in and connected with fireproof and ventilating floors."

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Fever Hospital and House of Recovery, Cork Street, Dublin: October 26, 1894.

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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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TENDERS, ETC.

** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

COMPETITIONS OPEN.

DURHAM.—March 25.—Competitive Schemes are Invited for the Sewage Disposal of the District. Premiums 100l. and 50l. for Two Best Schemes. Mr. F. Marshall, Town Clerk, Durham.

IPSWICH.—March 25.—Designs are Invited for the Building of a Workhouse and Infirmary, with Specifications and Estimate. Premiums 100l. and 50l. Mr. A. F. Vulliamy, Clerk to the Guardians.

LEEK.—March 4.—Designs are Invited for Proposed Covered Markets. Premiums 50l., 25l. and 10l. offered. Right reserved to carry out the Work by the Board's Architect. Mr. C. Henshaw, Clerk to the Improvement Commissioners, Leek.

CONTRACTS OPEN.

ACCRINGTON.—Feb. 8.—For Extension [of Wesleyan Chapel and School. Mr. R. Dixon, 5 Birch Street, Accrington.

AIRDRIE.—Feb. 18.—For Construction of Service Reservoir. Messrs. M'Creaths & Stevenson, Engineers, 208 St. Vincent Street, Glasgow.

ALRESFORD.—Feb. 20.—For Building Stables. Messrs. John Colson & Son, Architects, 45 Jewry Street, Winchester.

ARMAGH.—March 1.—For Wrought-iron Girder Road Bridge. Mr. Joseph Atkinson, junr., Court House, Armagh.

ASHFORD.—March 4.—For Erection of a Board School with Master's Residence and Offices. Mr. H. J. Jeffery, Architect, Ashford.

AUDENSHAW.—For Building Four Dwelling-houses. Mr. J. H. Burton, Architect, Warrington Street, Ashton-under-Lyne.

BACUP.—For Works in Building Baptist Chapel. Messrs. Smith & Cross, Architects, Bacup.

BALLYMENA.—Feb. 25.—For Building Methodist Church and School. Mr. J. J. Phillips, Architect, 61 Royal Avenue, Belfast.

BATLEY.—Feb. 15.—For Building Long Chimney at Hick Well Mills. Messrs. Holcm & Fox, Architects, Westgate, Dewsbury.

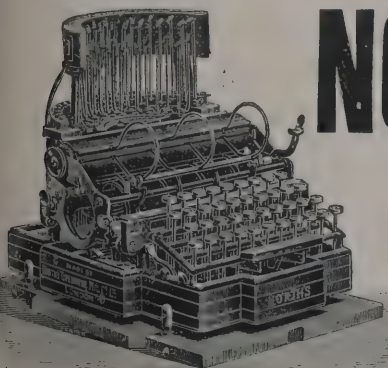
BELFAST.—Feb. 16.—For Building Goods Shed at Station. The Engineer, York Road Station, Belfast.

BILSTON.—Feb. 9.—For the Construction of Engine-house, Boiler-house, Well-house, Workshop, Coal Shed, Chimney Shaft, Entrance Gates, Fencing, Road-making, &c. Mr. Baldwin Latham, M.I.C.E., 13 Victoria Street, S.W.

BLACKBURN.—Feb. 13.—For Building Eight Houses. Mr. John B. Thornley, Architect, 45 Market Street, Darwen.

BOSTALL HEATH.—Feb. 12.—For Erecting Public Convenience, Bothy, &c. Mr. H. De la Hooke, L.C.C., Spring Gardens, S.W.

BOURNEMOUTH.—Feb. 9.—For Erection of Show Building and Works in Connection with the Royal Counties Agricultural Society. Mr. Charles Simmons, Basingstoke.



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BOURNE.—Feb. 24.—For Works to Board School (Local Tenders only). Mr. Alexander Farr, Clerk, Bourne, Lincolnshire.

BRYNMAWR.—Feb. 12.—For Additions to Board Schools, Building Caretaker's House, Boundary Walls, &c. Mr. E. A. Johnson, Architect, Abergavenny.

BUCKPOOL HARBOUR.—Feb. 23.—For Construction of Pier. Mr. Lewis B. Barclay, Engineer, Buckpool, Buckie, N.B.

BURNLEY.—Feb. 11.—For Building Four Dwelling-houses. Mr. Abm. Nutter, Architect, 23 Nicholas Street, Burnley.

BURY.—Feb. 26.—For Alterations and Additions to Caretaker's House at Whitehead Recreation Ground. The Borough Engineer.

BUXTON.—Feb. 11.—For Additions, Wesley Chapel, in Connection with Proposed Organ. Mr. W. R. Bryden, Architect, 1 George Street, Buxton.

CARDIFF.—Feb. 11.—For Addition to Guildford Street Chapel Premises. Mr. G. Thomas, Architect, Queen's Chambers, Cardiff.

CARDIFF.—For Building Block of Offices, Stabling, &c., for Thirty-two Horses. Messrs. J. P. Jones, Richards & Budgen, Architects, 18 St. Mary Street, Cardiff.

CARLISLE.—Feb. 11.—For Building House for Private Patients at the Lunatic Asylum. Mr. G. D. Oliver, Architect, Carlisle.

CHESTER-LE-STREET.—Feb. 9.—For Rebuilding Premises, Front Street. Mr. H. T. Gradon, Architect, 22 Market Place, Durham.

CO. KERRY.—Feb. 19.—For Construction of Quays. Mr. Singleton Goodwin, County Surveyor, Co. Kerry.

CROYDON.—Feb. 18.—For Widening and Improving Main Line of L.B. & S.C.Ry. Mr. F. D. Banister, C.E., London Bridge Station.

DAVENTRY.—Feb. 20.—For Additional Schoolroom and Classrooms. Mr. J. Williams, Architect, Moot Hall, Daventry.

DONAGHADEE.—Feb. 22.—For Building Four or Five Houses. Mr. Thomas Pentland, Architect, 81 High Street, Belfast.

DOVER.—Feb. 19.—For Reconstruction of Damaged Portion of Pier. Mr. John J. Webster, Engineer, 39 Victoria Street, Westminster.

EDINBURGH.—Feb. 9.—For Construction of Underground Conveniences. The Burgh Engineer, 1 Parliament Square, Edinburgh.

EMBLETON.—Feb. 25.—For Building Schools. The Vicar, Embleton.

GLOSSOP.—For Building Three-Storey Mill (247 feet long by 60 feet wide). Messrs. Olive & Partington, Turn Lee Mills, Glossop.

GODALMING.—Feb. 14.—For Building Cemetery Chapels, Lodge and other Works. Messrs. Welman & Street, Church Street, Godalming.

GLAMORGANSHIRE.—Feb. 12.—For the Construction of a Passenger Station at Maesteg for G.W.R. Co. Mr. J. K. Mills, Paddington Station.

GREAT YARMOUTH.—Feb. 11.—For Building Excursion Train Tavern, North Quay. Mr. J. E. Teasel, Architect, 3 Queen Street, Great Yarmouth.

GROOMSPORT.—Feb. 19.—For Building School. Mr. John MacLarnon, Groomsport, Ireland.

GUILDFORD.—Feb. 11.—For Supply of 500 Tons of Broken Aberdeen or Blue Guernsey Granite. Mr. F. T. Maltby, C.E., Guildford.

HALIFAX.—Feb. 18.—For Building Vicarage. Messrs. Horsfall & Williams, Architects, George Street, Halifax.

HAMPSTEAD.—Feb. 14.—For Execution of Works and Supply of Materials for One Year. Mr. A. P. Johnson, Vestry Hall, Hampstead.

HANWELL.—Feb. 11.—For Sewering, Levelling, Paving, Kerbing, Channelling and Making-up Nightingale Road. Mr. S. Barnes, District Council Offices, Church Road, Hanwell, W.

HASLINGDEN.—Feb. 16.—For Construction of the following Lengths of Brick Sewers, viz. 1,213 Lineal Yards 3 feet 4 inches Diameter Sewer in 9-inch Brickwork; 1,628 Lineal Yards, 3 feet 6 inches by 2 feet 4 inches in 9-inch Brickwork; 25 Lineal Yards 3 feet Barrel Overflow Sewer in 9-inch Brickwork—2,866 Lineal Yards. Together with Bell-mouth Junction, Overflow and Penstock Chambers, Manholes, and other Works in Connection therewith. Mr. Henry A. Cutler, A.M.I.C.E., Municipal Offices, Rawtonstall.

HENLEY-IN-ARDEN.—Feb. 14.—For Construction of Sewerage Works and Supply of Cast-iron Pipes, &c. Mr. J. Edward Willcox, C.E., Union Chambers, Temple Row, Birmingham.

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HIRWAIN.—Feb. 19.—For Extension of Joint Schools. Mr. T. Roderick, Architect, Clifton Street, Aberdare.

ISLINGTON.—Feb. 21.—For Execution of Works and the Supply of Materials for One Year. Mr. W. F. Dewey, Vestry Hall, Upper Street, N.

ISLINGTON.—Feb. 21.—For Supply of Gas-fittings and Work in Connection with the Maintenance of Lamps and Columns for Three Years. Mr. W. F. Dewey, Vestry Hall, Upper Street, N.

LANCHESTER.—Feb. 13.—For Building Infectious Hospital. Mr. J. W. Rounthwaite, Architect, 13 Mosley Street, Newcastle-on-Tyne.

LANGPORT.—Feb. 23.—For Construction of Waterworks. Mr. J. T. Hawkins, Engineer, Somerton.

LATHOM.—Feb. 11.—For Supply and Delivery of 220 Tons 6-inch, 5-inch, and 4-inch Cast-iron Water-pipes. Messrs. Wood & Brodie, 3 Cork Street, Liverpool.

LEEDS.—Feb. 9.—For Building Three Detached Residences, Roundhay. Mr. W. Carby Hall, Architect, 42 Prudential Buildings, Park Row, Leeds.

LEEDS.—Feb. 22.—For Additions to Primrose Cottage. Mr. T. Butler Wilson, Architect, 12 East Parade, Leeds.

LEEK.—Feb. 23.—For Building Business Premises (Standard Union Rates of Wages for the Workmen). Messrs. W. Sugden & Son, Architects, Leek.

LINCOLN.—Feb. 13.—For Construction of Filters at Irrigation Farm. Mr. R. A. MacBrair, City Surveyor, Silver Street, Lincoln.

LONDON.—Feb. 12.—For Constructing Public Conveniences, Bothy, &c., Bostall Heath. Architect's Department, County Hall, Spring Gardens, S.W.

LONDON.—Feb. 12.—For Enlargement and Alteration of Fire-Engine Stations in Farringdon Road and Renfrew Road. Mr. H. De la Hooke, Clerk to the London County Council, Spring Gardens, S.W.

MAESTEG.—Feb. 12.—For Construction of Passenger Station, &c. Mr. G. K. Mills, Secretary, Paddington Station, W.

MAIDA HILL.—Feb. 15.—For Erection of a New Postmen's Office. Messrs. Karlake & Mortimer, Old Queen Street, S.W.

MERTHYR TYDFIL.—Feb. 9.—For Building Two Semi-detached Villas. Mr. T. C. Wakeling, Architect, Market Square Chambers, Merthyr Tydfil.

NEWCASTLE, CO. DOWN.—Feb. 20.—For Building Three Dwelling-houses. Mr. Henry Hobart, Architect, Dromore, Co. Down.

NORTH LONDON.—Feb. 11.—For Chimney Shaft, Boiler Setting, &c. Messrs. Thomas & Taylor, 99 Fonthill Road, Finsbury Park, N.

NOTTINGHAM.—Feb. 15.—For Building Public Baths. Mr. Arthur Brown, Borough Engineer, Guildhall, Nottingham.

ORMSKIRK.—Feb. 11.—For Laying Mains. Messrs. Wood & Brodie, Engineers, 3 Cook Street, Liverpool.

PARLIAMENT HILL.—Feb. 19.—For Construction of a Steel Footbridge. Mr. H. De la Hooke, Clerk to the London County Council, Spring Gardens, S.W.

RAYLEIGH.—Feb. 21.—For Building Villa and Stabling. Mr. James Thompson, Architect, Cliff Town Road, Southend-on-Sea.

RAWTENSTALL.—Feb. 11.—For Enlargement of Albion Mill Weaving Shed. Messrs. George Hardman & Co, Albion Mill, Rawtenstall.

RIGTON.—For Building Three Houses in Stone. Mr. Geo. Riley, Architect, Calverley, Leeds.

SALFORD.—Feb. 18.—For Building Board School. Mr. Henry Lord, Architect, 42 John Dalton Street, Manchester.

SEDFIELD.—Feb. 9.—For New W.C. Block, Dining-room, &c., at County Lunatic Asylum. Mr. Wm. Crozier, County Architect, Shire Hall, Durham.

STAMFORD.—Feb. 20.—For Pulling-down Tenements and Additions to other Premises. Mr. James Richardson, Borough Surveyor.

ST. BEES.—Feb. 11.—For Alterations to Albert Hotel. Mr. J. S. Moffat, Architect, 53 Church Street, Whitehaven.

TONBRIDGE.—Feb. 8.—For Supply and Fixing Cornish Boilers and Cooking Range, with Ovens, Steam Jacketted Boiling Pans, Vegetable Steaming Closets, Steam Hot-plate, Circulating Tank, &c. Messrs. Clements, Jeakes & Co., 51 Great Russell Street, W.C.

TREORKY.—Feb. 14.—For Building Two Shops, &c. Mr. J. Rees, Architect, Hill Side, Pentre, Rhondda.

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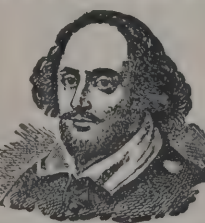
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TONBRIDGE.—Feb. 15.—For Additions, &c., for New Kitchen, Boiler-house, &c. Mr. Frank William Stone, Tunbridge Wells, Clerk to the Guardians of Tonbridge Union.

UCKFIELD.—Feb. 25.—For Taking-up and Relaying about 350 Lineal Yards of 18-inch Stoneware Pipe Sewer, Alter and Enlarge Sewage Tanks, Build Sewage Well and Engine House, Provide and Fix Gas Engine and Pumping Machinery, Lay about 450 Lineal Yards of 6-inch Cast-iron Rising Main, with all Valves &c. necessary, also 350 Lineal Yards of 9 inch Stoneware Outfall Sewer, Lay-out and Under-drain the Irrigation Area, Build all necessary Manholes, Valve Chambers. Mr. Wm. Willis Gale, East Grinstead, Sussex.

WEST BRIDGFORD.—Feb. 8.—For Alterations to Bridge. Mr. W. H. Radford, Engineer, Angel Row, Nottingham.

WEST HAM.—Feb. 12.—For the Supply of Portland Cement, Thames Ballast and Granite Pitchers. Mr. Lewis Angell, Town Hall, Stratford.

WEST HAM.—Feb. 19.—For Supply of Furniture for Three Board Schools. Messrs. J. T. Newman & Jacques, 2 Fen Court, E.C.

WEST HAM.—Feb. 19.—For Concrete Situ Paving at Three Board Schools. Messrs. J. T. Newman & Jacques, 2 Fen Court, E.C.

WOODBIDGE.—Feb. 26.—For Additions to Block D at Isolation Hospital. Mr. Edward L. Lunn, Architect, 36 High Street, Guildford.

TENDERS.

ABERDEEN.

For Construction of 630 Yards of a 21-inch Main Intercepting Pipe Sewer, with Ventilating Manholes, &c., in Don Street and Wellington Street, Woodside, for the Town Council. Mr. WILLIAM DYACK, Burgh Surveyor.

A. McKay £677 17 6

BANDON.

For Construction of Additional Works in Connection with the Bandon Waterworks, for the Guardians.

J. Donoghue £596 0 0

M. Collins 417 0 0

A. W. Smith, Bandon 267 10 0

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For New Hall, Billiard, Reading and other Rooms, at Ballater.

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J. Stewart, Cambus-o'-May, mason	£972 10 0
W. Duquid, Ballater, carpenter	735 0 0
J. Grant, Ballater, slater	150 0 0
W. Mitchell, Ballater, plasterer	146 12 0
G. Emslie, Ballater, plumber	89 0 0
W. Austin, Ballater, painter	22 0 0

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For Construction, for the Barrow-in-Furness Corporation, of 1,200 Lineal Yards of Cast-iron Outfall Sewer of 4 feet Internal Diameter, with all necessary Manholes, Tide-flaps, and other Appendages, &c.; also for the Supply of Cast-iron Pipes.

T. Gibson, London	£13,157 13 6
Williamson & Co., Sunderland	8,351 4 9
J. Moffatt, Manchester	8,184 6 4
E. WATTS, Barrow-in-Furness (accepted)	7,483 2 7

BOOTLE.

For Supplying, Working and Constructing the Steps of the Terrace in the New Park, Bootle, together with the Balusters and Retaining Walls in Connection therewith, for the Corporation of Bootle.

J. Moore, Macclesfield	£357 7 0
B. J. Hobson, Kirkdale	315 0 0
G. WOODS & SON, Bootle (accepted)	311 8 0
Wilkinson & Co, Newcastle-on-Tyne	281 12 0

CHESTER-LE-STREET.

For Building Court-house and Additions to Chester-le-Street Police Station, for the Standing Joint Committee of the County. Mr. WILLIAM CROZIER, County Architect, Durham. Quantities by Mr. J. EZRA MILLER, Sunderland.

J. Jopling, Chester-le-Street	£1,618 7 2
I. Oates, Picktree	1,597 5 0
T. Hunter, Washington	1,528 17 0
Graddon & Son, Durham	1,488 10 0
Draper & Sons, West Rainton	1,469 15 1
Kell & Groves, Chester-le-Street	1,416 10 6
J. Elliot, North Shields	1,410 0 0
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For Erecting Small Schoolroom at Congregational Chapel, Cowbridge Road. Mr. EDWIN SEWARD, F.R.I.B.A., Architect, Queen's Chambers, Cardiff.

D. E. Jones, Gloucester	£725	0	0
Jones & Thornley, Penarth.	667	10	0
W. Symonds, Cardiff	649	10	0
Hatherly & Carr, Bristol	627	0	0
J. Haines, Cardiff.	595	0	0
B. Evans, Cardiff	593	4	0
A. Howell, Cardiff	590	0	0
A. J. Colborne, Caerphilly	588	3	0
Knox & Wells, Cardiff	588	0	0
Latty & Co., Cardiff	587	0	0
H. Morgan, Cardiff	578	14	0
W. Best & Co., Cardiff	572	0	0
C. Price, Cardiff	566	0	0
W. T. Morgan, Cardiff	565	0	0
E. R. Evans Bros., Cardiff	546	6	9
C. C. DUNN, Cardiff (accepted)	534	13	2

CROYDON.

For Building Boundary Walls at Croydon Infirmary, for the Guardians.

T. Brooks, Plumstead	£351	0	0
P. R. Hubbard, Croydon	345	0	0
G. P. & H. Barnes, Streatham	320	0	0
J. Smith & Sons, Norwood	248	0	0
S. Page, Croydon	248	0	0
Winderbank & Co., Balham	247	0	0
A. Jones, South Norwood	245	0	0
W. Marriage, Croydon	240	0	0
J. W. Jones, Croydon	230	0	0
A. Bullock, Croydon	229	0	0
Streeter Bros., Croydon	227	0	0
G. E. Bryan & Son, South Norwood	223	0	0
H. Bateman, Croydon	218	0	0
W. Smith & Son, Croydon	189	0	0
Umlandt & Nicoll, Croydon	187	0	0
F. W. SEDGWICK, Thornton Heath (accepted)	179	10	0

COSHAM.

For Outfall Sewage Works in connection with the Cosham Sewerage Works, Hants, for the Fareham Rural District Council. Mr. ARCHIBALD FORD, Engineer, 11 High Street, Portsmouth.

Cooke & Co., Battersea	£1,987	0	0
T. P. Hall, Southsea	1,847	0	0
F. Bevis, Portsea	1,780	10	0
W. R. LIGHT & SON, Landport (accepted)	1,763	0	0

DARWEN.

For Joiner's and Slater's Work in New Central Stores, School Street, Darwen. Mr. J. B. THORNLEY, Architect, Darwen.

Joiners.

J. Knowles, Darwen	£3,700	0	0
J. Highton, Blackburn	3,550	0	0
S. Harwood, Darwen	3,314	0	0
B. Lloyd & Sons, Darwen	3,050	0	0
R. SHORROCK, Darwen (accepted)	2,999	0	0

Slating.

W. Eccles, Darwen	200	11	0
J. Knowles, Darwen	200	0	0
S. Harwood, Darwen	181	15	0
Thornton, Bradford	164	0	0
R. Shorrock, Darwen	150	0	0
B. LLOYD & SONS, Darwen (accepted)	145	0	0

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For Works of Improvement at the Men's Bathing-place, consisting of Building Breakwater Walls, Steps and Flooring, in Concrete, Forming Approaches, and Building Retaining Walls and Guard and Walls in Concrete and Rubble Masonry, Blasting Rocks in Strand, Trunking, &c., for the Town Commissioners.

Hickson & Peet, Tralee	£399	18	0
J. Butler, Dungarvan	374	18	6
D. M'Grath, Dungarvan	333	13	10
G. STOKES, Dungarvan (accepted)	317	0	0
Engineer's estimate	353	19	3

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For Building East Street Schools and Teacher's Residence, for the School Board.

Hall, Godalming	£7,780	0	0
Bellam & Co., London	7,473	0	0
Martin, Wells & Co., Aldershot	6,890	0	0
H. Patrick & Co., Farnham	6,796	0	0
W. Smith, Farnborough	6,757	10	0
Chuter, Frensham, Farnham	6,598	10	0
W. A. Field & Co., Brighton	5,568	0	0
Goddard, Farnham	6,548	0	0
Hughes, Wokingham	6,469	0	0
Jenkins & Sons, Bournemouth	6,449	0	0
Kemp, Aldershot	6,297	0	0
Fitt, Reading	6,279	0	0
Bottrill, Reading	6,230	0	0
Peters & Co., Horsham	6,125	0	0
CHINCHEN, Bournemouth (accepted)	5,700	0	0

HASTINGS.

For Laying 348 Feet of 15-inch, 350 Feet of 12-inch, 527 Feet of 9-inch Hassall's Patent Jointed Pipes, and 200 Feet of 6-inch Ordinary Pipe Sewers in High Street, Hastings, for the Corporation. Mr. P. H. PALMER, Borough Engineer.

G. BELL, Tottenham Hale (accepted). £398 0 0

For Laying down Sewers in St. Leonards Green Road and Clarence Terrace Road, in the Parish of St. Matthew's, for the Rural District Council.

Cockrell & Sons, Gorleston	£1,205	0	0
W. Coker, Halling, Rochester	1,122	0	0
J. R. Hunt, Haywards Heath	1,121	0	0
F. Free & Sons, Maidenhead	1,029	0	0
Padgham & Hutchinson, St. Leonards	1,023	0	0
T. Adams, Wood Green	1,018	0	0
Horscroft & Mills, Maidstone	992	0	0
G. Bell, Tottenham	985	16	7
W. H. Saunders & Co., Bournemouth	977	7	0
S. Saunders, Upper Parkstone	907	3	9
E. Gukell, Silverhill	825	0	0
A. King, Hollington	810	0	0
W. Piper, Hastings	765	0	0
J. PIPER, Hastings (accepted)	704	9	0

HORSHAM.

For Supply and Fixing of Seven "Simplicitas" Closets in the Place of those now in use at the Workhouse and Infirmary, and Other Alterations, for the Guardians. Mr. CHAS. H. BURSTOW, Architect, North Street, Horsham.

G. Sharp, Horsham	£134	0	0
M. Etheridge, Horsham	131	15	0
P. Peters, Horsham	126	10	0
Ireland Bros., Horsham	111	0	0
Sendall Bros., Horsham	99	0	0
J. Potter, Horsham	97	10	0
H. Richardson, Horsham	96	3	6
L. Smith, East Grinstead	82	10	0
H. DEWDNEY, Horsham (accepted)	80	10	9

LONDON.

For Alterations and Additions, Telegraph Public-house, White-chapel, E., for Mr. Charles Martin. Mr. ERNEST H. ABBOTT, Architect, 6 Warwick Court, High Holborn, W.C. Quantities by Mr. ALFRED JOHNSON, 50 Imperial Buildings, Ludgate Circus, E.C.

T. W. Smith & Son, Isledon Works, Northampton Street, Essex Road, N.	£698	0	0
A. Fordham, 175 Jubilee Street, E.	683	0	0
John Anley, 27A Dalston Lane, N.E.	671	0	0
W. Harper, 83 Jubilee Street, Stepney, E.	660	19	6

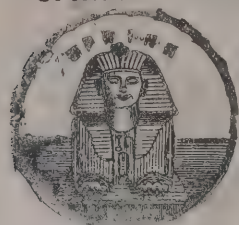
For Alterations at the Peacock, Cambridge Road, Bethnal Green, E., for Messrs. E. J. Rose & Co. Mr. EDWARD BROWN, Architect, Fleur-de-Lys Street, Bishopsgate.

Hood Bros.	£1,078	0	0
L. Whitehead & Co.	860	0	0
G. E. TODD (accepted)	791	0	0

For Rebuilding No. 96 Powis Street, Woolwich, S.E., and Workrooms in Rear, for Messrs. S. H. Cuff & Co. Mr. H. H. CHURCH, Architect, William Street, Woolwich. Quantities by Mr. W. WHINCOP, 15 Kyverdale Road, Stoke Newington, N.W.

J. Chapman	£2,570	0	0
Young & Lonsdale	2,424	0	0
Munday & Sons	2,418	0	0
H. L. Holloway	2,390	0	0
Balaam Bros.	2,367	0	0
Chessum & Sons	2,253	0	0

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LONDON—continued.

For Supply and Running of Mains, and Wiring of Buildings and Grounds of the North-Western Fever Hospital, Haverstock Hill, for the Metropolitan Asylums Board.
VAUGHAN & BROWN, Kirby Street, E.C. (accepted).
Cost about 1,200l.

For Altering present Church Institute, Brunswick Road, into Branch Public Library, for the Commissioners of Public Libraries and Museums for Bromley St. Leonard. Mr. G. H. L. STEPHENSON, Architect, 57 Moorgate Street, E.C.

White & Son, Bow	£540	0	0
Collins, Bow Road	530	0	0
A. J. SHEFFIELD, Poplar (accepted)	505	0	0

NEWBRIDGE.

For Building Mixed and Infants' Schools to Accommodate about 500 Children at Newbridge, Mon, for the Mynddislwyn School Board. Mr. GEORGE ROSSER, Architect, Victoria Buildings, Abercarn.

Hatherly & Carr, Bristol	£3,395	0	0
Williams & James, Pontypridd	3,349	8	8
D. C. Jones, Gloucester	3,254	0	0
J. Francis & Son, Newport	3,189	0	0
Morgan & Evans, Pontnewydd	3,067	0	0
T. Westacott, Newport	3,034	10	0
H. Parfitt, Pontnewydd	3,000	0	0
D. Lewis, Llanhilleth	3,000	0	0
A. Richards, Newbridge	2,985	0	0
J. Linton, Newport	2,950	0	0
C. F. Morgan, Newbridge	2,920	0	0
Davies Bros., Abercarn	2,886	0	1
Monks & Co., Crumlin	2,773	15	0
Gaen Bros., Abertillery	2,746	17	0
J. JENKINS, Newport (accepted)	2,530	0	0

PEMBROKE DOCK.

For Building Classroom and other Work at the Meyrick Street Schools, for the Pembroke School Board. Mr. E. P. LADD, Architect, Pembroke Dock.

W. Davies, Tenby	£237	10	0
Evans & Morris, Pembroke Dock	234	14	0
A. Drinkwater, Pembroke	202	5	5
D. John, Pembroke Dock	200	0	0
F. Noakes, Pembroke Dock	196	10	0
C. YOUNG, Pembroke Dock (accepted)	187	10	0
Architect's estimate	250	6	11

SEAFORD.

For New Road and Sewer, for Mr. R. Lamb. Mr. B. A. MILLER, Surveyor.
G. Bell, London £205 0 0
W. H. SAUNDERS & CO., Bournemouth (accepted) 200 0 0
Surveyor's estimate 215 0 0

STAINES.

For Construction of Works of Sewerage and Sewage Disposal, for the Staines Urban District Council. Mr. G. MAXWELL. LAWFORD, Engineer, 13 Victoria Street, Westminster. Quantities by Messrs. PRYCE, CUXSON & LEIGH.

Contract No. 1.

G. Wimpey & Co., Hammersmith	£17,031	18	0
G. Osenton, Westerham	15,538	0	0
G. Bell, Tottenham	15,278	0	0
T. Adams, Wood Green	15,072	5	5
H. Hill, Maidenhead	13,439	19	0
J. Dickson, St. Albans	13,404	0	0
B. Cooke & Co., Battersea	13,220	0	0
J. Mowlem & Co., Westminster	13,000	0	0
Wilkinson Bros., Finsbury Park	12,938	0	0
J. Jackson, Plaistow	11,767	16	0

Contract No. 2.

Hughes & Lancaster, Westminster*	13,379	11	2
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* Recommended for acceptance.

WANSTEAD.

For Making-up of Camden, Mansfield and Sydney Roads, for the Wanstead Urban District Council.

W. Gibbs, Limehouse	£398	2	3
T. Adams, Wood Green	359	0	0
J. Mowlem & Co., Grosvenor Wharf	332	0	0
J. Jackson, Leyton	295	0	0
J. Jackson, Forest Gate	269	0	0
W. Griffiths, Kingsland Road	254	0	0
J. REEVES, Walthamstow (accepted)	238	0	0
Surveyor's estimate	264	0	0

THE Oswestry Town Council propose to apply to the Local Government Board for permission to borrow 2,100l. to relay the water mains in the town, as advised by Mr. Rolfe, engineer, owing to the corrosion of the pipes, laid twenty years back.

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They also invite the particular attention of the trade to their IMPERIAL PATENT BLIND LINES, which are very superior to anything yet offered. They can be obtained of all Rope-makers, Ironmongers, Merchants, Factors and Wholesale Houses in town and country.

N.B.—Please note that all our goods, as advertised above are labelled, either inside or outside with our Trade Mark—"The Anchor."

NOTES ON NOVELTIES.

THE patent range boiler invented by T. Potterton, heating engineer, of Balham, S.W., is worthy of the notice of all architects and engineers, as it utilises the heat that is usually wasted from the kitchen fire to warm the house. It can be seen at 122 Cavendish Road, Balham, without making any appointment, warming seven rooms and conservatory, besides supplying hot water for domestic use, the range being used for cooking purposes at the same time, there being only the range fire in the house, therefore effecting an immense saving in fuel. The boiler can be fitted to any kitchen; the system, being low pressure, is therefore safe. The fire is kept burning ten hours (all night) without attention with a top feeder, which fits on the range, thus keeping the house warm and insuring hot water early in the morning. Any system is undoubtedly healthy that will keep the whole house at one even temperature and afford a great saving in labour, and diminish dirt, dust, &c. The boiler is fitted to the range, so that all parts of flue and man lids for internal cleaning are accessible without taking down coverings. If used for supplying hot water only, it gives from 100 to 200 gallons an hour, according to size, and is therefore useful for supplying baths, lavatories, laundries, hotels, &c. The patent greenhouse boiler by same inventor is also worthy of attention.

BUILDING AND BUILDERS.

SOME of the residents in Aberdeen propose to form a company with the view of building a new theatre in the city, and at a meeting just held a provisional committee was appointed to make inquiries and report the result.

AT a joint conference of the finance committee of the Middlesex County Council and the Highgate justices, held at Northfield Hall, Highgate, it was resolved to recommend to the Council to purchase a large plot of land at the corner of Archway and Church Roads, Highgate, for the erection thereon of new police-court buildings for Highgate and the district. At present the petty sessional sittings are held at Northfield hall, which has been found inconvenient and inadequate in many respects for the purpose.

THE Naval Exhibition site, on the Chelsea Embankment, has been let upon a building lease by the Commissioners of Chelsea Hospital, and is now being covered with mansions from the twenty-three designs prepared by the architect, Mr.

Delissa Joseph. The property will be known as Chelsea Embankment Court.

IN Glasgow Sheriff Court, Sheriff Balfour awarded 75% and expenses to John Macintyre, a journeyman joiner, residing at 31 Scotia Street, in an action raised by him against Matthew Henderson, wright and builder, Grant Street. The defender had a contract for the joiner-work of a warehouse in Queens Street, and the pursuer was one of the workmen required to erect and use a scaffold at certain work which he was instructed to execute. The scaffold gave way and the pursuer was thrown to the ground and injured. He maintained that the defender failed to provide suitable material for the construction of the scaffold, and that the accident was caused by such failure.

THE question of extending the present workhouse accommodation for Northampton, or of building a new workhouse, is under consideration by the Board of Guardians. The Local Government Board officials advise the building of a new workhouse, estimated to cost for site of ground and architect's commission a total of 54,000*l.*, against which an asset of 14,000*l.* or 15,000*l.* could be realised for the old buildings.

AT Atherton it is proposed to build a new Wesleyan chapel, at an estimated cost of 3,000*l.*

ELECTRICAL.

THE tender of Messrs. F. W. Ball & Co., of Bristol, has been accepted for installation of electric light in the Bristol Guildhall, and portion of the Council House.

SOME electrical engineers have recently inspected the ground from Colwyn Bay to Conway, and through Deganway to Llandudno, being the route over which it is proposed to lay an electric tramway, and at a meeting held in Llandudno expressed their willingness to accept the responsibility of laying down the whole line, including the construction of a swing-bridge over the river Conway, providing that the local authorities grant their consent.

THE watch and electric-lighting committee of the borough of Eccles have made a joint recommendation in favour of the adoption of the electric light. This, it is believed, can be effectively accomplished at the present cost of gas-lighting or at a moderate increase thereon. The watch committee are willing to enter into an agreement for the supply of electricity to the street lamps in place of the gas now supplied by the

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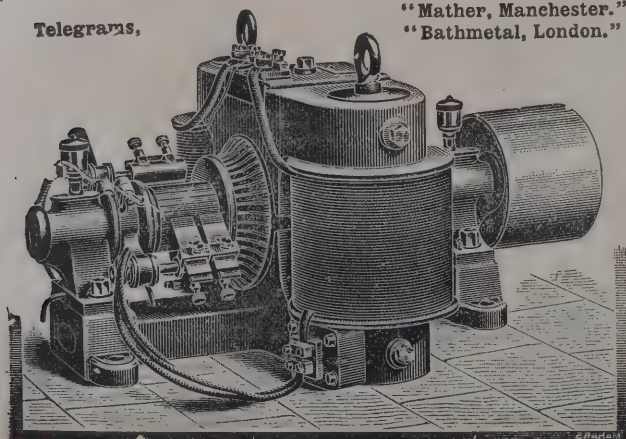
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"MANCHESTER" DYNAMO.

Salford Corporation. The electric-lighting order already obtained provides that the area of supply shall be the whole of the borough of Eccles.

At the meeting of the Yorkshire House-to-House Electricity Company, Limited, held in Leeds, a dividend at the rate of 4 per cent. per annum upon the ordinary shares of the company was declared.

The tramways committee of the Leeds City Council have decided to recommend the adoption of the conduit system of electric traction in the centre of the city and the overhead-wire system for the outskirts.

At the meeting of the Worcester City Council, it was stated by Mr. Williamson that the total loss on the electric-lighting works for the first quarter was less than 100%, and he held out strong hopes that by next winter the scheme would be bringing in a profit. He further stated that the builder's extras in the erection of the generating station amounted to between 4,000/ and 5,000/. The committee regarded that as very unsatisfactory, and they proposed to inquire into the matter exhaustively, and see what extra work had been done and by whose authority.

VARIETIES.

It will be agreeable news, especially to Irish ladies, that the well-known London firm, Messrs. Oetzmann & Co., are about to open a Dublin branch on Wednesday, the 20th inst., at 61 Grafton Street, where they will supply every requisite for furnishing the home, or hotels, clubs, theatres, &c., in artistic fashion, at very moderate prices. Samples of their tapestries, cretonnes, &c., and the handsome carpets offered by Messrs. Oetzmann are to be seen at 61 Grafton Street, where, too, their Dublin manager, Mr. Walter Fleming, will supply their comprehensive catalogue. Messrs. Oetzmann will deliver free in Dublin any goods which may be ordered of them before the 14th inst.

At the Congregational church at Liscard, Cheshire, the heating apparatus set fire to the woodwork, and considerable damage was done to the pews and fittings before the fire was put out.

The fine block of buildings constituting the linoleum mills of Mr. James Williamson, M.P., at Lancaster, were almost entirely burned out. The works are the most extensive in Lancaster, and employ some thousands of people. From the beginning there was little hope of saving the building, owing

to the combustible nature of the manufacturing materials. Dense smoke from burning cork stores greatly impeded the firemen. The loss is roughly estimated at about 30,000/.

KILKENNY COURT HOUSE was partially destroyed by fire on Sunday. Luckily the outbreak was observed at an early hour, and the legal documents were rescued; but despite the efforts of the firemen, aided by the military, damage to the extent of 2,000/ was done.

At Bath, the Fernleigh Hotel, North Parade, has just been destroyed by fire. The damage is stated to be covered by insurance.

At the meeting of the Upper Stour Valley Main Sewerage Board, the question of damage to the Board's sewers by mining operations having been discussed, the engineers, Messrs. E. B. Martin and W. J. Fiddian, were instructed to communicate with Lord Dudley's mining engineers on the subject. It was also decided to accept the tender of Messrs. Cochrane & Co., Woodside, Dudley, for the supply of 2,800 tons of cast-iron pipes, at a cost of 10,442/ 2s. 3d. The Local Government Board wrote that they had recommended the Public Works Loan Commissioners to advance the Board loans of 28,353/ and 59,080/ for the purposes of sewerage and sewage disposal.

DAMAGE estimated to amount to about 20,000/ has been done by fire at the well-known Caledonia Cabinet and Chair Factory belonging to Mr. Matthew Pollock at Beith. The works, which were the most extensive in the furniture trade in the West of Scotland, were situated at the north-west part of the town. There was also a valuable stock of walnut, pollard oak, mahogany, ash, rosewood, and other valuable wood in course of seasoning, and prepared wood. Owing to frost in connections and disrepair of pipes the water could not be used for any purpose. There is a partial insurance of 15,000/.

At South Wingfield Waterworks a Local Government inquiry has been held to consider an application for sanction for a loan of 4,700/ for water supply purposes. It was proposed to take water from two brooks, two springs, and a borehole for the supply of the village, which contains about 1,300 inhabitants. There would be filter beds and a small service reservoir, and the water would be delivered by gravitation. Dr. Barwise, medical officer of health for the county, thought two of the sources of supply might be polluted by surface contamination. Mr. Strelley suggested a supply from the Oakerthorpe spring. The inspector inspected the line of pipes and site of works. Mr. W. H. Radford, C.E., of Nottingham, is engineer to the scheme.

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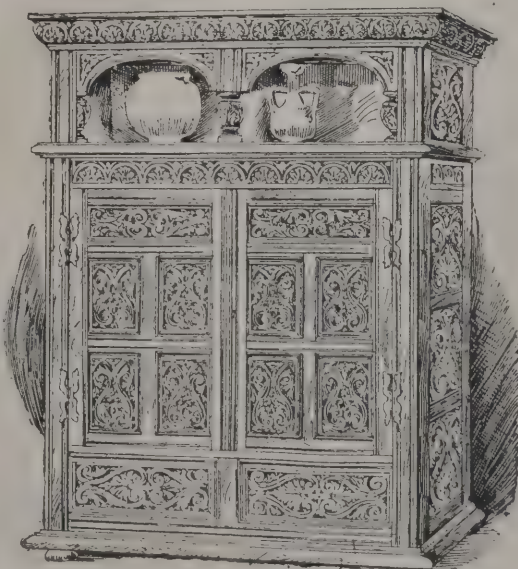
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Replica of an OLD ENGLISH Carved Oak Hall Press
16th century, 5 feet wide, 7 feet 6 inches high.

A GREAT fall of cliff has taken place between Dover and St. Margaret's Bay, at Langdon Stairs, midway between the two points, and close to the coastguard station and Foreland lighthouse. An enormous piece of cliff has fallen at Foreland, representing many tons. The attention of the Board of Trade and other Government authorities has been several times lately called to the serious inroads of the sea here, and the necessity of co-operation in protecting the foreshore.

THE park committee of the West Bromwich Town Council, in a report, state that they have considered a design, prepared by the borough surveyor, for laying out the land presented by Miss Kenrick for a public park for Spon Lane Ward. The cost of the scheme is estimated at 4,738*l*. The committee recommend the Council to adopt the scheme, and to make application to the Local Government Board for permission to borrow 5,000*l*. for the purpose of carrying out the work.

AT the meeting of the Lanark County Council a memorial in reference to an improvement of the public road and the erection of a new bridge over the Kittoch Water, Carmunnock, was remitted to the committee on highways.

AN inquiry has been held by the Local Government Board at Birmingham into the application of the City Council for sanction to borrow sums amounting to 14,238*l*. for purposes connected with the public libraries and school of art, for the widening of Moor Street and for fencing and the laying-out of St. Paul's Churchyard.

THE inspector of the Board of Trade, Major Cardew, has issued his report on the recent street explosion at the corner of Cannon Street and Budge Row. He describes the immediate causes of the accidents, and adds a number of recommendations to prevent such occurrences in the future. He says if the precautions he has specified are thoroughly carried out, he considers there will be no further cause for anxiety as regards the public safety.

REPORTS upon the cathedral muniments of Worcester and Lichfield have been drawn up by Mr. Reginald L. Poole, and will be printed in a volume now in preparation by the Historical Manuscripts Commission, which will also contain the Rev. W. D. Macray's reports upon the records of the Corporations of Lincoln and Bury St. Edmunds.

AN inquiry has been held at Nelson relative to a proposed loan respecting 30,000*l*. for works of private and street improvements, 8,000*l*. for sewerage and sewage disposal, 1,641*l*. for a bridge in Leeds Road and 1,500*l*. for the completion of the Town Hall.

TRADE NOTES.

THE new additions to the county asylum, Fareham, Hants, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

THE Cathedral at Bermuda, which was dedicated on December 21, has been lighted throughout by the "Cathedral" lamp. The *Bermuda Royal Gazette* gives a long notice of the ceremony, and mentions that "the lighting of the cathedral was tested on Wednesday evening and found in every respect excellent, a soft well-diffused light, from Jones & Willis's patent 'Cathedral' burners." The whole of the fittings were constructed under the superintendence of Messrs Hay & Henderson, architects, of Edinburgh, by Jones & Willis, of Birmingham and London.

INSTITUTION OF MECHANICAL ENGINEERS.

THE Institution of Mechanical Engineers held their forty-eighth annual general meeting in the rooms of the Institution of Civil Engineers, in Great George Street, when there was a large attendance of members. Professor Alexander B. W. Kennedy, having been re-elected president, took the chair, and moved the adoption of the Council's report for the past year. The report stated that at the end of last year the number of names in all classes on the roll of the Institution was 2,221, as compared with 2,157 at the end of the previous year. During 1894 there were added to the register 152 names, against which the loss by decease was 31 and by resignation or removal 57. The financial receipts during the past year had been 7,081*l*., while the expenditure, actual or estimated, was 5,292*l*. The capital of the Institution amounted to 38,535*l*., the greater part of which was invested in railway debenture stocks. Experiments upon the use of ropes and belts for the transmission of power, announced a year ago as about to be undertaken by the Société Industrielle du Nord, at Lille, had since been carried out, and Professor Capper, who attended them on behalf of the Institution, would make an independent report upon them in due course. In reply to a member, the President stated that a committee had been appointed to consider the question of applying a portion of the funds of the Institution to securing a place of assembly of its own in London. The report was unanimously agreed to.

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ILLUSTRATIONS.

COUNCIL CHAMBER, NEW TOWN HALL, BURTON-ON-TRENT.
TOWN HALL, BURTON-ON-TRENT.

ENTRANCE HALL, THURLAND CASTLE, KIRKBY LONSDALE.

THE SOCIETY OF ENGINEERS.

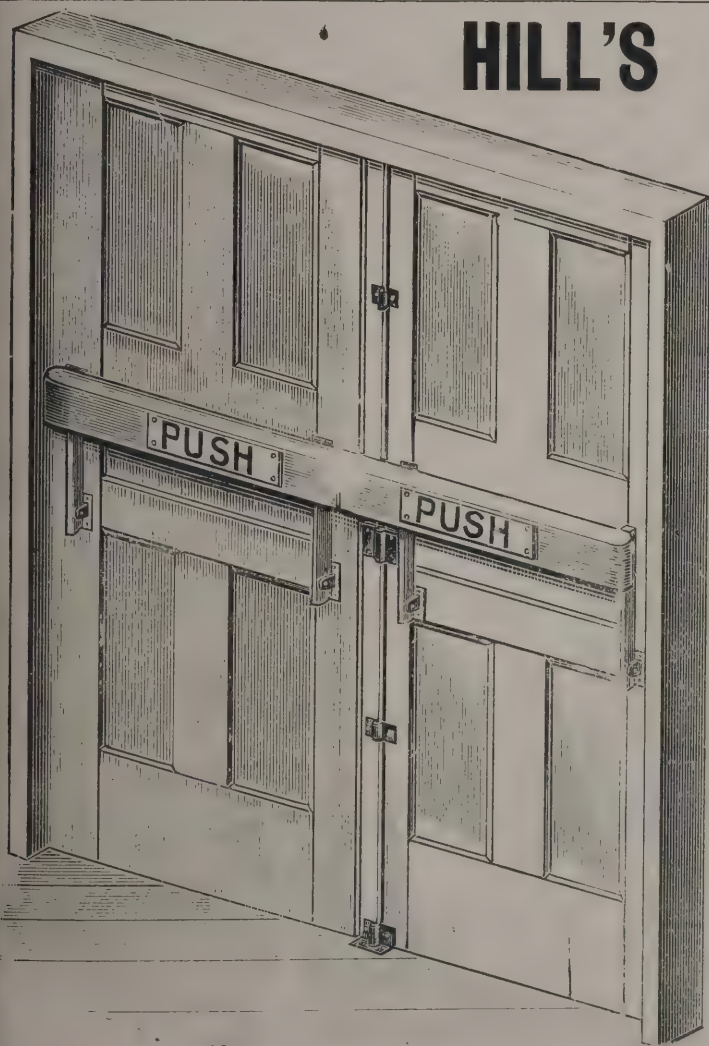
ON Monday Mr. Wm. George Peirce, the new president of this Society, opened the session by an address at the Westminster Palace Hotel. He noticed the papers read and the works visited by the Society during the past year, and pointed out the present satisfactory position of the Society, both numerically and financially. Next he referred to the progress of electrical traction as evidenced by the City and South London Railway and the Liverpool overhead line, the successful working of which, he said, had paved the way for the Waterloo and City electric line, of which he gave particulars. Inland navigation was then touched upon in connection with the conference in Belgium, and he observed that the great question was, whether canals should be placed in competition with railways, and so assist the agriculturist. The difficulty was that the canals for the most part belonged to the railway companies. After referring to the opening of the new lock and weir at Richmond and its satisfactory results, and the opening of the Manchester Ship Canal and the Tower Bridge, Mr. Peirce gave some particulars of the Blackwall Tunnel now in course of construction. This important public work is being constructed by a combination of methods which unite the use of the shield, cast-iron segments and compressed air. It will consist of 3,083 feet of cast-iron lining; 1,382 feet of cut-and-cover in brickwork and concrete, and 1,735 feet of open approaches, giving a total length of 6,200 feet from entrance to entrance. Up to the 2nd of January last, 722 feet 6 inches of tunnel under the river had been completed. The President then went on to deal with the question of water supply. As a waterworks engineer, he treated this subject at some length. He observed that Liverpool had now an excellent supply, and Birmingham had commenced works for supplementing her present supply by a gravitation scheme, whilst Edinburgh was contemplating a similar undertaking. Referring to the water famine at Leicester, he observed that the water storage there was too limited for the growing requirements of the town, and an

additional storage reservoir was in course of construction. As a matter of fact, water engineers generally must look to meeting future requirements, so as to avoid possible water famines in our great and growing towns. That was now being done in the Metropolis, where the daily water consumption in 1891 was 182,456,905 gallons. According to the report of the Royal Commission which had just completed its labours, the estimated daily consumption in 1931 would be 294,000,000 gallons. To meet the growing requirements, the Metropolitan Water Companies are constantly increasing their sources of supply. Those taking the bulk of their water from the Thames and Lea are opening up the gravel beds overlying the London clay. Others have been sinking wells and driving adits in the chalk, and he stated that the various operations were, as a rule, giving satisfactory results, so that, as far as the Metropolis is concerned, there would appear to be no fear of a water famine, at any rate for some time to come. After giving some particulars respecting the coal production and consumption of the world, the President concluded his address by a reference to technical education, which, he said, was of no practical value to the young engineer, unless it was combined with knowledge gained in the daily round of the factory and workshops, shoulder to shoulder with workmen.

A vote of thanks was passed to Mr. George A. Goodwin, the late president, and the premiums for papers read during the past year were awarded as follows:—The President's gold medal to Mr. T. W. Baker, "Utilisation of Town Refuse for Generating Steam;" the "Bessemer premium" to Mr. Ed. C. de Segundo, "Power Distribution by Electricity, Water and Gas;" the "Rawlinson premium" to Mr. R. Nelson Boyd, "A Deep Boring near Friestadt, Austria, by the Canadian System;" and a "Society's premium" to Mr. H. B. Ransom, "The Principles and Practice of Hydro-extraction."

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

THE Civil and Mechanical Engineers' Society visited on Saturday, February 2 (by kind permission of the chairman of the Ealing Urban District Council, Mr. Nelson; the engineers, Sir F. Bramwell, Bart., and Mr. H. G. Harris, and the Council's surveyor, Mr. C. Jones), the Ealing Electric Lighting Works, the sewage works, refuse destructors, and Jones's fume cremator. There were several points of considerable interest



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to be noticed, among them being the utilisation of the waste heat from the destructors and cremator for assisting in the heating of the boilers, and the employment of the effluent water from the sewage works for the purposes of condensation. The capacity of the lighting station is 4,000 8 candle-power lamps, equal to 5,500 installed lamps; 4,125 lamps are already installed. The supply was commenced on October 3 last. The mains for lighting the streets are in duplicate, one set conveying the electric current to every alternate arc lamp and the other to the intermediate lamps, so that in the event of a breakdown through an accident the town will not be thrown into darkness. The arc lamps are in "series," the dynamos being of course "series" machines, and the "exciters" are "shunt" machines. The system adopted for domestic supply is known as the high tension, the voltage being 2,000; this is reduced by "transformers" to 100 volts before reaching the consumers' houses. The mains to the transformer sub-stations are what are known as armoured concentric. The distributing mains are single and unarmoured, and are drawn through earthenware pipes. From these distributing mains the house services are taken. The mains were constructed by Messrs. T. O. Callender. There are three Lancashire boilers 27 feet 6 inches long by 7 feet diameter, fitted with McDougall's stokers, and provision has been made for a second set of three boilers. The dynamos are of Messrs. Siemens Bros.' make, as are also the switchboards. The engines are by Messrs. Browett & Lindly, and are as follows:—Two 100 h.p., coupled direct to alternator dynamos; two 500 h.p. ditto, for the incandescent or domestic supply; two 15 h.p., for the exciter dynamos; and three engines of 40 h.p. for the arc light sets. Bellis's condensing plant will be used. Provision has been made for extension of works, which will be very soon needed, and arrangements have been made for two additional engines of 250 h.p. each. The charge made by the Council is 6d. per Board of Trade unit for lighting purposes, but for motive power, cooking and heating, only 4d. is charged. The current is measured by meter in all cases. Mr. A. P. Ford Moore represented the engineers in their absence through illness, and lucidly explained the arrangement and working of the plant.

Mr. C. Jones then took the members over the sewage works, and pointed out to them his system of getting rid of the sludge from the settling tanks, by which he did away with the expense of compressing it; and further he, by means of the sludge, enriched the clinkers from the refuse destructors

(Fryer's), and obtained a useful substance for making concrete with, a sample of which was shown, and when broken fully bore out all that had been said in its favour. The clinker when broken also made an excellent substance for metalling roads with. The system adopted for the disposal of the sewage is a simple one, being as follows:—Milk of lime is put into the raw sewage, with a small quantity of clay, and is then run into a settling tank; from here it is run off and mixed with sulphate of alumina (3 grains to the gallon), passed through another settling tank, and then run over an aerating weir and into the Thames. In the event of an epidemic of any kind the sewage after being treated would be allowed to run through a series of channels before reaching the weir, so as to expose it for a longer time to the purifying effect of light and air. The sludge is run into a tank with an impervious bottom and refuse walls, through which the water filters and is drained away, and on to the top of the sludge more refuse is thrown, and the whole is allowed to drain for about three days, and is then mixed with more of the town refuse and thrown into the destructors: the fumes of these are passed through the cremator and their noxious character destroyed. Mr. S. A. Court, C.E., on the party returning to the electric works, proposed, and Mr. E. H. G. Brewster, C.E., the hon. sec., seconded a vote of thanks to Mr. C. Jones and Mr. A. P. F. Moore, and to the engineers, for what had been a most interesting and instructive visit. The proposal was received with acclamation, and Mr. C. Jones having replied, the members returned to town.

Mr. JAMES KEITH has prepared a further report on the heating and ventilation of the Houses of Parliament, in which he points out very serious defects, in addition to those dealt with in his previous report to the First Commissioner of Works. Mr. Keith in the later report points out that the sewer-gas, which is openly liberated into the lower section of the ventilating shafts, finds its way into the committee-rooms and press gallery, and occasionally into the debating chambers of both Houses of Parliament. He further states that the atmosphere of the committee-rooms and corridors is contaminated through the arrangements for ventilating the adjoining lavatories. His chief recommendation for remedying defects are that the sewer-gas be liberated through separate pipes running to the top of the tower, and that silent fans be for extracting the vitiated air instead of coke fires as at present.

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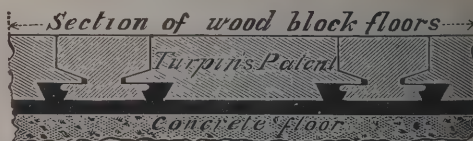
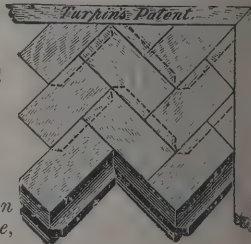
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ALUMINIUM WORKS AT FOYERS.

AN Inverness correspondent of the *Scotsman* writes:—An Aluminium Company has been floated, which is to take clay containing that mineral from Ireland to the side of Loch Ness through the Caledonian Canal. Great electrical power is required to extract the mineral from the clay, and it is proposed to construct extensive works in the Valley of the Foyers, in order to generate the necessary force. One of the lochs is to be raised 60 feet and another 30 feet; a public road along the side of Loch Faraline is to be submerged, but it is understood a good road will be substituted. The dammed-up waters are to be conveyed to Loch Ness side, where the necessary turbine and other machinery for generating electricity will be constructed. The calculations of the promoters will involve, it is stated, the necessity of withdrawing the water from the Foyers during the summer and autumn months. A meeting of the Inverness District County Council has been convened for February 22 to consider a letter from Mr. Charles Innes, solicitor, Inverness, on behalf of the British Aluminium Company, asking that a proposal to submerge certain public roads and substitute others be sanctioned.

SUN INSURANCE COMPANY.

THE Yorkshire headquarters of the Sun Fire and Life Assurance Company have just been removed from East Parade, Leeds, to 15 Park Row. The building in Park Row has not been specially erected, for it was quite a modern stone structure. Nevertheless it has been subjected to a complete overhauling internally. Behind the front portion of the premises an important addition has been made, and the suite of offices has been practically doubled by the building of a substantial pile, with a frontage to Basinghall Street. The two blocks are connected with each other by a wide corridor on each floor. In place of the old narrow stairs a large central staircase has been provided, up the centre of which there is a hydraulic lift, without which no commercial building is nowadays complete. It goes without saying that no expense has been spared in imparting an attractive appearance to the various rooms and corridors, and the result is that the whole forms one of the finest blocks of offices in the city. The architectural work has been carried

out from designs prepared by Messrs. Chorley & Connon, Leeds. Mr. Windsor Thorp, architect, Commercial Street, Leeds, was entrusted with the task of designing the fittings for the rooms occupied by the insurance company itself. The office itself is supplied with richly designed polished furniture. The bulk of the woodwork here exposed to view is of the hardest and best quality of Burmah teak, a wood well known to be about the least liable to shrinkage, or to be affected in any way by variations in temperature. The internal woodwork, where not in view, is either of mahogany, canary wood, or sequoia, which have also been selected for their peculiar individual advantages. The external woodwork in the private rooms of Mr. Roberts and Mr. Wootton is of the best figured Riga wainscot oak, fumed and wax polished. The distinguishing features of the fittings are their elaborate and rich treatment as regards design, materials and carving, and the excellence of the workmanship. They have been made by Messrs. R. Garnett & Sons, Warrington and Penketh, under the immediate supervision of Mr. Thorp. All the carving will bear the closest scrutiny, not only because of the beauty of the designs, but because of the manner in which the designer's ideas have been brought out to the full. As examples of fine carving, some of the panels in the general office will be hard to beat. Special attention may be drawn to that over the entrance door, and to the one in the centre of the overmantel opposite. The latter is cut in deep relief, and illustrates the "mark" of the office, which was discovered comparatively recently in the vaults of the Sun office amongst some old papers. It bears the date January 13, 1711, and was for policy No. 838. In this room are the panels of fibrous plaster designed by lady students attending the Leeds School of Art. The ceiling in the front office is also worthy of particular mention. It is a very fine example of plaster-work, the design being very intricate and very pretty. The building is lighted throughout with electricity.

The work, apart from the furniture, has been carried out by the following contractors:—The dial and art metal work, Messrs. Soutter & Sons, of Birmingham; masonry and brickwork, Messrs. Nicholson & Sons; carpenters and joiner's work, Messrs. J. Tomlinson & Sons; plumbers and glazier's work, Mr. J. Lindley; plasterer's work, Mr. T. Moore; slater's work, Messrs. Sharp & Harper; painter's work, Mr. C. Fenton; lift, Mr. R. Middleton; faience work and tiles, Messrs. Webb Brown & Co.; book lift and lift enclosure, Mr. A. Dougill; modelling, Messrs. Thewlis & P'Anson; electric lighting, Mr. Wilson Hartnell; gas engine, Messrs. Crossley Bros.; iron

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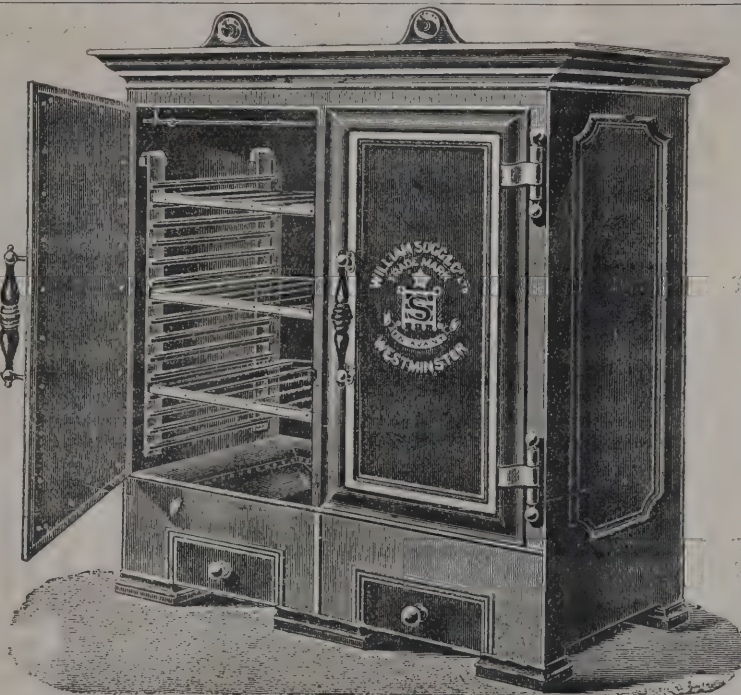
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ELECTRIC EXPLOSIONS.

THE report of Major P. Cardew, the Board of Trade inspector who recently held an inquiry into the two explosions which occurred in the electric-light conduits in the Euston Road, on December 29, has been presented. He says:—"After careful consideration of the evidence, and of my own investigations, I am of opinion that the explosions were caused by the firing of a mixture of coal-gas and air by an electric spark. I account for the presence of coal-gas by leakage from the mains of the Gas Light and Coke Company at one or more points in the vicinity of the electric-light conduits, percolation of the escaped gas along the lines of gas and electric mains, which are parallel and in close proximity, where the soil has been frequently disturbed; and entry into the electric conduits and boxes wherever small openings may exist, which, from the construction and materials used, will certainly be the case at many points. The gas would naturally percolate into the open space provided by the electric-light conduit, and this would be facilitated, to some extent, by the small amount of heat produced by the electric current in the mains. It is probable that, since the general adoption of wood pavement and other forms of pavement, which prevent the escape of gas from the soil directly into the open air, the danger of its percolating into underground chambers has been materially increased. The means provided by the St. Pancras Vestry for the immediate escape of any gas from their conduits are, in my opinion, totally inadequate, and even a slight leakage of gas into the conduits would be likely to accumulate until the proportion of gas in the air reached that necessary to form an explosive mixture. The occurrence of an electric spark was, I think, probably a result of formation of salt incrustation on the insulators. This no doubt acts, to some extent, as a conductor, and if a piece break away, a small spark would very likely be caused.

"The Vestry of St. Pancras should lose no time in removing the two existing causes of danger which I have indicated, viz. the possibility of an accumulation of coal-gas in their conduits, and that of the occurrence of an electric spark at their bare conductor mains. This system of mains and conduits was selected, I believe, mainly for economical reasons, and no

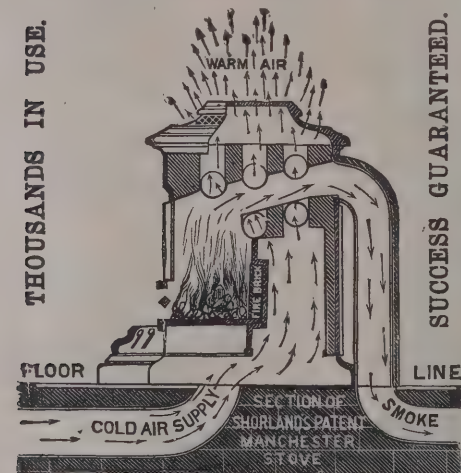
doubt it has advantages in this respect, but these economical advantages must not be reaped at the expense of the safety of the public using the streets. The Vestry were, I understand, advised by Professor Robinson, after the serious explosion which occurred on January 12, 1894, in a street box in Endsleigh Gardens, close to the position of the recent explosion, to carry out a system of efficient ventilation wherever possible, and in a report on this accident which was forwarded to the Vestry by the Board of Trade I also advised this, and further recommended that, where possible, two small chambers should be substituted for the large ones at present in use as street boxes, and that the low insulation of the negative main, which was then, as now, a very noticeable defect, should be remedied. Sufficient attention has not, I consider, been paid by the Vestry to these recommendations. It was stated by Mr. Baron, the chief engineer, at the inquiry, that there are only eleven ventilating pipes and three ventilating covers to street boxes for a total length of $6\frac{1}{2}$ miles of conduit, and the nearest ventilating pipe was about 300 yards from the scene of the explosion. None of the large street boxes have, it appears, been divided into two smaller ones, as suggested by me, and the attempts made to remedy the serious leakage on the negative main have not so far been successful. I am of opinion that the Vestry should immediately provide a thorough system of ventilation, or means for the immediate escape of gas from their conduits and street boxes, should reduce the empty space available for accumulation of gas in their street boxes as far as possible, and should carefully guard against the dangerous formation of an incrustation of salts on the insulators of the negative main by frequent inspection, and by protecting these insulators against drip from the condensation of moisture on the iron lids of the street boxes."

INSANITARY PROPERTY IN LEEDS.

How to deal with the insanitary areas of the city, says the *Leeds Mercury*, is one of the questions now uppermost in the minds of the leading officials and members of the Leeds Corporation. Correspondents have urged the desirability of dealing with individual houses rather than with whole areas, removing an obstructive building here and taking down dilapidated property there, and in this way letting air and light into a district without entirely demolishing the existing property. A scheme of this sort in regard to the large area

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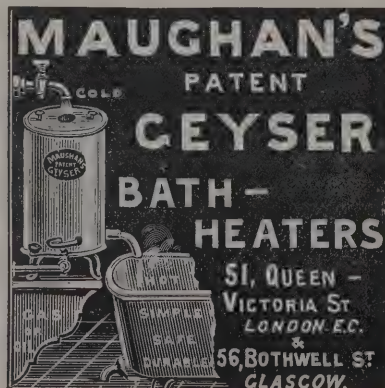
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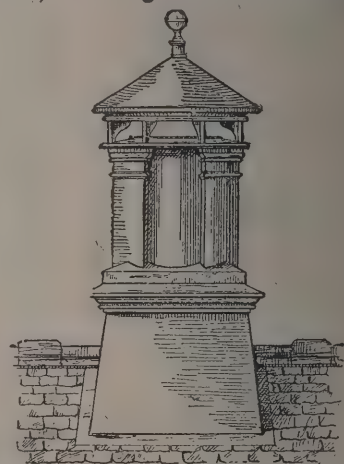
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between Quarry Hill, Marsh Lane and the Lady Beck was placed before the sanitary committee in 1890 by the present medical officer of health. His suggestions were made in consequence of an outbreak of typhus fever in that district. By that scheme it was proposed to run a new street through part of the area and here and there to remove obstructive houses, so as to let the air into the back yards and generally improve the district. The rough estimate of the cost of such an improvement was laid before the committee at the time, but the medical officer thought it necessary also to point out "that great as would be the advantage of letting light and air into this unhealthy neighbourhood, the authorities would still leave houses of a very inferior type, most of them, however, well drained, and so far as their present structure would admit, sanitariously good, but small, dirty, redolent of odours of generations." Taking this into account, the medical officer suggested it might be wiser to consider the question of the removal of the whole area. For something less than 800,000l. they might clear away entirely this nest of disease, although, of course, the question of providing accommodation for the displaced inhabitants would remain. The alternative suggestions of the medical officer of health were referred to the city engineer, who reported again to the sanitary committee, under whose consideration the matter has been ever since. If the sectional plan is adopted, only one portion of the area will be dealt with at a time, and the Corporation will be compelled by the Local Government Board to provide the necessary accommodation before going on with the next section. If, however, instead of dealing with the area in this way, under the first part of the Housing of the Working Classes Act, the authorities were to adopt the first suggestion of the medical officer of health, and to deal piecemeal with a few houses here and a few there, this could be done under the second part of the Housing of the Working Classes Act; and as no provisional order would be required, the Corporation could proceed with their displacements without providing any fresh accommodation. The first part of the Act of 1890 deals with large insanitary areas such as the one mentioned; the second enables a sanitary authority not only to get rid of individual houses unfit for habitation, the houses which, though they might not in themselves be unfit, yet might be regarded as obstructing the passage of air and light to others, and thus rendering them unsuitable for dwellings; but this part of the Act also, enables authorities to deal with such small areas as the one in Camp Field, and with other districts too limited to require the putting into force of

the first part of the Act. The mode of dealing with these smaller areas under the second part of the Act is considerably less cumbersome than the method required under the first part. Even the provisional order can be dispensed with if the property-owners and the Corporation have agreed as to matters of price. The advantage of dealing with a large district such as the one already named in the North-East Ward is that the Corporation are enabled not only to pull down buildings which no one for a moment would regard as proper places for human habitation, not only to remove obstructive dwellings which prevent the circulation of air through courts and alleys, but to get rid, if necessary, of whole streets of habitations, and to open out wide streets and introduce fresh air and sunshine into the slums. The great fault in the original laying-out of the insanitary area in question seems to have been the utter disregard paid to the inhabitants' requirements of air and light. Pulling down a house here and there would do a certain amount of good, but it would still leave large numbers of houses scarcely fit to be used as dwellings, and it would perpetuate the irregular, crooked streets along which the air cannot freely pass. The acquirement by the Corporation of sections time after time would not necessarily mean that the whole of the houses in that section would be pulled down. This, however, it would mean, that no new house would be erected on the old street lines. New streets would be planned at once, and gradually the whole of the property in the section would be removed and replaced by more modern and healthier dwellings.

THE PAINTING OF HAMMERSMITH BRIDGE.

THE following letter has appeared from Mr. W. Dudley:—

As the contractor who undertook this work in 1888, may I be permitted to state the true facts, as distinguished from the imaginary ones put forward on behalf of the works committee of the County Council?

1. All my materials as used in connection with the painting, such as white lead, raw and boiled oil, turps, varnish, gold and driers, were examined and approved by the Board of Works.

2. Mr. Sydney Webb alleges that "the work was not done in the winter." This statement is untrue, the fact being that I commenced the work in September 1888, and completed it in 1889.

3. I was compelled to put up scaffolding for the whole of the

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bridge at the same time, and give one coat of paint throughout before commencing the second coat. The same fact also applies to the third coat, and also to the gilding and varnishing. So much care was exercised in connection with the scaffolding that not a single man employed received even a scratch throughout the whole of the job.

4. The whole of the materials used were of the best quality, and I am prepared to prove that they cost from 15 to 20 per cent. more than the present market price.

5. With regard to the wages paid, no painter received less than sevenpence-halfpenny per hour, most of them eightpence, labourers sixpence, scaffolders sevenpence. Most of the men employed had worked in the decoration of Bermondsey Town Hall. That hall is as good now as when finished. It did not, of course, require an experienced painter to rub down the ironwork.

6. I personally superintended the whole of the work, and everything was done to the entire satisfaction of the Board of Works.

7. By all means let the works committee have a fair trial, but is it not most unjustifiable on the part of the representatives of that committee to excuse their own incompetency and extravagance at the expense of one who did the work in a satisfactory and workmanlike manner, at hundreds of pounds less than the amount expended in connection with the recent painting of the bridge?

8. The apologists of the committee should understand that I have to get my living by hard work, and not by delivering addresses to endeavour to justify extravagant and unjustifiable expenditure.

MANCHESTER SOCIETY OF ARCHITECTS.

COMBINED warming and ventilating was the subject of a lecture delivered by Mr. J. D. Sutcliffe before the Manchester Society of Architects on February 5. The lecturer contended that the warming effect of an open fire upon a room is not obtained direct from the rays of heat, but from their reflection from the various material objects with which they come into contact, otherwise that the sole effect of the fire is to draw cold air into the room, especially along the floor. Much more warmth was derived by direct radiation from common stoves, pipes and coils, but in all of these cases there is no ventilation, the same air being breathed and warmed over and over again. Indirect radiation he described as obtained by

the 'passing of air over heated surfaces and thence into the room, always securing some ventilation as well as warmth. This combined warming and ventilation, when provision is made for supplying fresh air and simultaneously discharging vitiated air. He instanced the American system of Messrs. Smead, which is in operation at the Friends' Meeting House, Birkenhead; architects, Messrs. Grayson & Ould, of Liverpool. The Friends' Meeting House, Scarborough; architects, Messrs. Malcolm, Start & Rowntree, of Glasgow. It appears that results are satisfactory in both places, but that system does not admit of proper provision for filtering the air where the conditions of the atmosphere render that necessary.

The Plenum system, which is the best for large buildings, is always associated with mechanical force, and admits of any filtering arrangements. A fan draws in external air through a filter, and at the same time propels it through heating apparatus, whence the filtered and warmed air is driven into main and branch ducts that terminate in the rooms to be warmed. Entering above the heads of the occupants the warm air necessarily rises at once to the ceiling, where it spreads, cools and consequently descends, eventually passing out at the floor level by exit ducts there provided. Dusty and other vitiated air is thus prevented from rising, and the weight of the respired carbonic acid gas accompanies and aids the descent. Experience proves that the warmth so derived is agreeable and equable, and the system prevents inward draughts or the entry of any contaminated atmosphere from outside, such entry being often experienced where mechanical force is applied solely for drawing foul air out. The system provides for entirely renewing the air of the room at any desired rate up to ten times an hour. The Plenum system is in operation (or it will be used when the buildings are complete) in Temple Chambers, Manchester (ninety separate offices), designed by Mr. Edward Hewitt, one of the honorary secretaries. London Board School, Whitechapel; architect, Mr. Bailey. Sheffield Higher Grade School; architect, Mr. Mitchell Withers. Winsford Technical School; architects, Messrs. Woodhouse & Willoughby, of Manchester. St. Helen's Technical School; architects, Messrs. Briggs & Wolstenholme, of Blackburn. Street Board School, Somerset; architect, Mr. W. Reynolds. Pendleton (John Street) School, for the Salford School Board. Salford Technical School; architect, Mr. Lord, of Manchester. Coventry Factory of the Pneumatic Tyre Company.

The Street Board School is specially referred to, though

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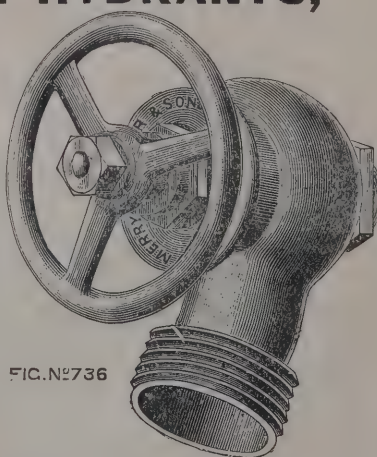


FIG. N°736



PROOF IMPRESSIONS of the BEAUTIFUL ART PLATES which appeared in the New Year's Double Number of "THE ARCHITECT," and in the Number for January 10, 1890, THE TOILERS OF THE DEEP. Two Tinted Ink Photographs (size 18½ in. by 13½ in.), may now be obtained, price 1s. each. Free by post, carefully packed in patent roller, 2s. 3d.

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one of the smallest in England; it was the first school in which the system was applied. Other schools are also satisfactorily warmed and ventilated by mechanical means, and innumerable factories, mostly upon the exhaust system, 25,000 Blackman fans being employed, capable of moving an aggregate of air averaging 800,000 tons per hour.

In Temple Chambers (the first building in which the system was completely applied) not one of the ninety rooms has a fireplace, the whole building being well warmed by one coke fire in the basement. It has been theoretically inferred that air, when treated as described, must be unhealthily dry, but repeated tests prove the presence of ample moisture.

In the Pendleton School, before it was opened, tests were applied which proved that the warming attained to 58 deg. when the temperature was below freezing-point outside. During the same period there was exhibited another development of the great utility of the system which, being got into operation as soon as the windows were in, thoroughly dried and made the whole place quite ready for occupation some weeks and perhaps months before it would have been as safe by any other means.

This school is the first completed one in Manchester and Salford district. The lecturer hoped Manchester would not be long behind their neighbour Salford.

Salford Technical School is a good illustrative example of a double-duct arrangement carrying cold and warm air separately. The additional facilities it gives for regulating temperatures are very highly appreciated. The supply of fresh air is equal to 3,000 cubic feet per hour for each student, providing for complete renewal four times an hour in the drawing and similar rooms, and ten times an hour in the chemical laboratories.

A hearty vote of thanks was passed to Mr. Sutcliffe.

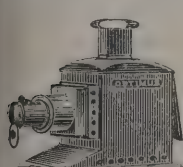
THE CABLING OF EDINBURGH TRAMWAYS.

A MEETING of the Lord Provost's committee of Edinburgh Town Council was recently held to consider the cabling of the tramways in the city. The burgh engineer (Mr. Cooper) submitted a plan of existing and new routes which might be worked by cable, along with a report on the subject. The total length of the existing double-line tramways in Edinburgh, exclusive of the line from the Post Office to Jock's Lodge, is 9½ miles; the length of the single line is 2·86 miles. In Leith

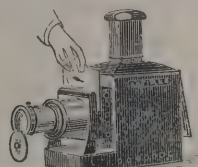
the double lines extend to 1·838 of a mile, and the single lines to 0·279 of a mile. The routes which he suggests for cabling are those on which the traffic is sufficiently heavy to justify the constant tear and wear common to the cable system, and he recommends that Edinburgh and Leith should be treated as a whole. He mentions two central power stations for Edinburgh—one in the neighbourhood of Tollcross and the other at the existing tramway depôt at Shrubhill, which is nearly seven acres in extent, and is the property of the Corporation, and which is large enough for all the purposes of the services. Mr. Cooper proposes that the first route should start from Shrubhill, travel into Leith, and cover Bernard Street and Junction Street, but that the Newhaven and Seafeld branches should continue to be worked by horses. The second route would also begin at Shrubhill, and, coming up Leith Walk, go south by the bridges and Clerk Street to the city boundary at Craigmillar, the existing line being extended to that point. Other extensions mooted were a line from Broughton Street, East Claremont Street, Broughton Road and Bonnington Road to the present line at Junction Street, and one from Leith Walk along London Road and Easter Road; but as it would be some time before these would prove remunerative, they are not put forward as practical proposals in the meantime, although they could also be propelled from Shrubhill. The line from Waterloo Place to Portobello would continue for the present to be worked by horses. The first route to be propelled from the Tollcross station would be that going north from Tollcross along Lothian Road, east by Princess Street to the Post Office, back to the Haymarket, and along the Dalry Road to the junction with the Colinton Road line at Polworth Terrace. The branch line from Haymarket to Coltbridge would in the meantime continue to be worked by horses. From the station at Tollcross the cable would travel by Leven Street, Bruntsfield Place and Morningside Road to the city boundary near the Braid Hills. On the cross route from Newington to Morningside serious difficulties in the working of the cable would be presented by the many sharp angles which occur, and it is suggested that the route might be straightened by being carried along Strathearn Road and Strathearn Place to Churchill. That cross route would be worked in conjunction with the cable from Tollcross to the Braid. The Gimmore Place route having only a fifteen minutes' service, and being a single line, the burgh engineer does not consider that cabling is urgent, and he thinks the route might be left alone. The

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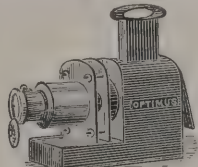
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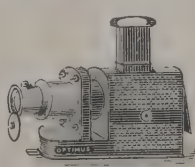
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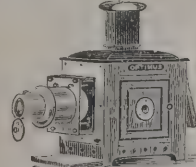
Student's Lantern (to take
demonstrating tank) with
Brass Sliding Tubes, 40s.



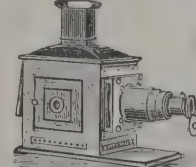
Russian Iron Body, Brass
Sliding Tubes,
45s.



Perforated Russian Iron
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Mahogany outside Body, Two
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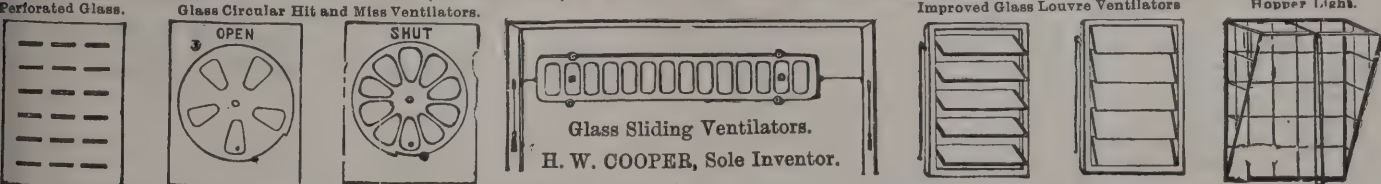
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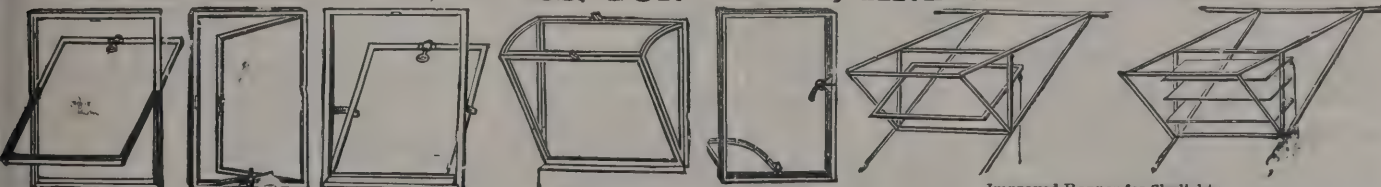


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were kept in closed vessels for some days, the growth of bacteria was much more rapid in some than in others. No bacteria associated with infectious diseases could be found in any of the specimens examined, although they were carefully searched for. The chemical and bacteriological examinations are in substantial agreement; both methods show that there is no sewage contamination of the water-supply.

THE INSTITUTION OF CIVIL ENGINEERS.

At the meeting of this Institution on Tuesday, the 29th ult., Mr. J. Wolfe Barry, C.B., vice-president, in the chair, the paper read was on "Boiler Explosions," by Mr. William H. Fowler, Wh. Sc., Assoc.M.Inst.C.E.

The author referred briefly to the theories, such as "deferred ebullition," "disassociation of water," "spheroidal condition," which were propounded to account for such explosions. He showed that it was the hot water rather than the steam in the boiler which formed the source of destructive energy, and, with a view to illustrate the amount of stored energy available in the event of explosions, pointed out that it was equivalent in the case of a Lancashire boiler 8 feet in diameter by 30 feet in length, at a pressure of 150 lbs., to the work expended in lifting the structure to a height of nearly 8,500 feet, roughly speaking equal to the explosion of 1,700 lbs. of gunpowder.

In regard to the causes of boiler-explosions, there was nothing occult or mysterious. They could, as a rule, be traced by patient investigation to the operation of simple and well-known facts. Thus when a boiler-shell was normally in a state of high tension, if once a rupture took place by the action of static stresses on a locally weak spot, the stored-up energy was capable, not only of tearing the boiler to pieces, but of producing all the other destructive effects observed in connection with such disasters.

Prominent among the principal causes of explosions was the corrosion of the boiler-shell. This was sometimes internal from the action of corrosive feed-water, and sometimes external as a result of dampness in the brickwork settings. This latter species of corrosion was much accentuated by the defective manner in which boilers were often set. The bearing surface of the brickwork on which the boiler rested was often much too wide and of such a character as to afford a convenient resting-place for the lodgment of moisture, with the result that corrosion was set up and went on unseen and un-

suspected. The safeguard against the operation of external corrosion was a suitable design of boiler-setting, and the adoption of periodical inspection, to facilitate which the flues should be so arranged as to be easily accessible.

The peculiar defect known in steam-boilers as grooving or channeling was the result of a combination of corrosion and of mechanical action, and was met with under a variety of circumstances; the mechanical action due to alternations of steam-pressure, which caused local fretting, and by splitting off the scale and oxide as fast as it was formed, much accelerated the corrosive action of the water. Instances of this kind were explained and illustrated in the flat ends of Lancashire and Cornish boilers, as well as in the fireboxes and uptakes of vertical boilers. In the case of locomotives the grooving met with was of a very specific character; it was confined, almost invariably, to the edges of the overlaps of the longitudinal seams, and to those boilers in which these seams were made with an overlap joint. No case of grooving had come under the author's notice where the joints in the barrel were of butt straps so as to preserve the true circular form. The reasons why this defect was more pronounced in locomotives than in other boilers were twofold. In the first place, the barrel was of small diameter, and thus the use of the overlap joint caused a relatively greater deflection from the circular form; and in the second place, this type of boiler was liable to sudden and large fluctuations of pressure, the mechanical action from which was further intensified by the jolting such boilers experienced in their daily work.

Some explosions had their origin in the stresses arising from expansion and contraction due to the action of the fire. This was especially the case in boilers of the externally fired class, of which the plain egg-ended type might be taken as a typical sample. In this type any sediment or dirt in the water naturally settled to the bottom over the fire and led to overheating, and when fed with cold water a long strip of the plating from end to end was suddenly chilled, causing serious straining at the ring seams. These were of so serious a character that although the ring seams were theoretically double the strength of the longitudinal ones, cases frequently occurred in which such boilers were rent in twain circumferentially and shot in opposite directions without giving the slightest preliminary warning.

In the ironworks districts a peculiar form of egg-ended boiler, set vertically and having a central flue with two or four radiating branch flues, was often used in connection with

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puddling furnaces for utilising the heat in the waste gases. This boiler had all the initial defects of the horizontal egg-ended one; and had been responsible for some of the most disastrous explosions on record, owing to the fact that, when such a boiler gave way, the contents of the surrounding puddling furnaces with which it was connected were scattered like a shower of Shrapnel upon the crowd of workmen engaged. The presence of the internal flues necessitated shells of large diameter and the consequent use of thick plates. This was inimical to the passage of heat, while the intense character of the flames which impinged upon the plates accentuated the trouble.

A common source of boiler-explosions in the past had been the practice of cutting large openings in boiler-shells, without providing compensating strengthening-rings. The result of cutting large openings in the shell was to accentuate greatly the stress at the edge of the hole on its longitudinal diameter. The exact distribution of the additional stress in consequence of the cutting away of the material was not known, but it was much greater at the edge of the hole than was generally supposed. Large domes were sources of weakness in a boiler-shell, even if the hole which permitted access to them were of small diameter.

Overheating from shortness of water was a common cause of boiler explosions, but the operation of this cause was different from the reason formerly assigned to it. Explosions were not the result of turning cold water on to red-hot plates. What took place was that the overheated plates became gradually softened, with the result that they bulged downwards and were rent at the ordinary working pressure; explosions of this kind were of a relatively mild character. As a safeguard the use of duplicate water-gauges was recommended, as well as a low-water safety-valve and a fusible plug, while the feed-pipe should be at such a level as to prevent any risk of the furnace-crowns being laid bare through the water syphoning back owing to a defective check-valve.

Many explosions arose from excessive pressure in consequence of the defective action of the safety-valve. This might occur in a variety of ways, but the type of valve loaded with a spring-balance was the most prolific source. This arose from the facility which the valve, as it was ordinarily fitted, provided for overloading by merely turning the thumb-nut, while it also permitted of tampering in many other ways. The practice of grouping the safety-valve and stop-valve on a common outlet was to be deprecated on account of the risk of the outlet being

plugged in the case of the boiler being under repair. Two disastrous explosions had been traced to this cause. Each fitting should have its own outlet, and valves of the dead-weight type were preferable to those with levers. If springs were necessary they should be direct-acting.

Explosions sometimes arose from faulty material and construction. As a result of using iron of poor quality with punched holes, incipient flaws were occasionally set up in the seams, and several cases had occurred in which these inherent defects were so situated as to forbid detection when the boiler was put together, and were only revealed by the explosion. These defects showed the value in connection with new work of a careful hydraulic test.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 1365. Arthur Calvert and William Durant, for "Improvements in means for securing slates in position upon roofs."
- 1450. George B. Pearson Wallis and Jabez Gibson, for "Draught excluder for doors, windows and the like."
- 1522. Alfred Conway, for "An improved chimney-pot."
- 1640. Henry Bennett, for "Draught excluder for the bottom of doors."
- 1666. Edward Traies, for "Improvements in water-closets or water-closet basins and traps."
- 1671. James Walmsley and Joseph Smith, for "Improvements in or appertaining to flushing-apparatus for water-closets and the like."
- 1673. Samuel Benjamin Dix, for "Improvements in wastes for lavatories, baths, urinals, &c."
- 1843. Thomas Birbeck and Matthew Butcher, for "An improved linked weight for window-sashes."

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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

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The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

TENDERS, ETC.

* * As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

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DURHAM.—March 25.—Competitive Schemes are Invited for the Sewage Disposal of the District. Premiums 100l. and 50l. for Two Best Schemes. Mr. F. Marshall, Town Clerk, Durham.

IPSWICH.—March 25.—Designs are Invited for the Building of a Workhouse and Infirmary, with Specifications and Estimate. Premiums 100l. and 50l. Mr. A. F. Vulliamy, Clerk to the Guardians.

LEEK.—March 4.—Designs are Invited for Proposed Covered Markets. Premiums 50l., 25l. and 10l. offered. Right reserved to carry out the Work by the Board's Architect. Mr. C. Henshaw, Clerk to the Improvement Commissioners, Leek.

CONTRACTS OPEN.

AIRDRIE.—Feb. 18.—For Construction of Service Reservoir. Messrs. McCreaths & Stevenson, Engineers, 208 St. Vincent Street, Glasgow.

ALRESFORD.—Feb. 20.—For Building Stables. Messrs. John Colson & Son, Architects, 45 Jewry Street, Winchester.

ARMAGH.—March 1.—For Wrought-iron Girder Road Bridge. Mr. Joseph Atkinson, junr., Court House, Armagh.

ASHFORD.—March 4.—For Erection of a Board School with Master's Residence and Offices. Mr. H. J. Jeffery, Architect, Ashford.

BALLYMENA.—Feb. 25.—For Building Methodist Church and School. Mr. J. J. Phillips, Architect, 61 Royal Avenue, Belfast.

BATLEY.—Feb. 15.—For Building Long Chimney at Hick Well Mills. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

BATTERSEA.—Feb. 16.—For Execution of Works and the Supply of Materials for One, Two, or Three Years. Mr. J. T. Pilditch, Municipal Offices, Battersea.

BATTERSEA.—Feb. 16.—For Cleansing, Repairing and Maintaining Three of Avery's Patent Weighbridges. Mr. W. Manus Wilkins, Municipal Buildings, Lavender Hill, S.W.

BATH.—March 5.—For Execution of Work and Supply of Materials for One Year. Mr. C. K. Fortune, 4 Terrace Walk, Bath.

BELFAST.—Feb. 23.—For Building Two Semi-detached Villas, Osborne Park. Messrs. Young & Mackenzie, Architect, Donegall Square East, Belfast.

BELFAST.—Feb. 16.—For Building Goods Shed at Station. The Engineer, York Road Station, Belfast.

BOURNE.—Feb. 24.—For Works to Board School (Local Tenders only). Mr. Alexander Farr, Clerk, Bourne, Lincolnshire.

BRENTFORD.—March 8.—For Two Bathrooms and other Works at Isolation Hospital. Mr. Nowell Parr, Surveyor, Clifton House, Boston Road, Brentford.

BRIGHTON.—March 1.—For Building Technical School. Mr. Francis C. J. May, Borough Engineer, Town Hall, Brighton.

BROUGHTON.—March 1.—For Erection of a Technical School. Mr. F. J. C. May, M.I.C.E., Town Hall, Brighton.

BUCKPOOL HARBOUR.—Feb. 23.—For Construction of Pier. Mr. Lewis B. Barclay, Engineer, Buckpool, Buckie, N.B.

BURY.—Feb. 26.—For Alterations and Additions to Caretaker's House at Whitehead Recreation Ground. The Borough Engineer.

CO. KERRY.—Feb. 19.—For Construction of Quays. Mr. Singleton Goodwin, County Surveyor, Co. Kerry.

CORFE CASTLE.—Feb. 28.—For Building Schools. Rev. E. H. Greenhow, Corfe Castle, Dorset.

COSELEY.—Feb. 18.—For Erection of Outbuilding and Boundary Walls, for the School Board. Mr. A. P. Brevitt, Architect, Wolverhampton.

CROYDON.—Feb. 18.—For Widening and Improving Main Line of L.B. & S.C.Ry. Mr. F. D. Banister, C.E., London Bridge Station.

CROYDON.—Feb. 19.—For Repair of Dingwall Avenue and Keeley Road. Mr. C. M. Elborough, 8 Park Street, Croydon.

CUDWORTH.—Feb. 19.—For Building Police Station, also another at Knottingley. Mr. J. Vickers Edwards, County Surveyor, Wakefield.

DAVENTRY.—Feb. 20.—For Additional Schoolroom and Classrooms. Mr. J. Williams, Architect, Moot Hall, Daventry.

DONAGHADEE.—Feb. 22.—For Building Four or Five Houses. Mr. Thomas Pentland, Architect, 81 High Street, Belfast.

DOVER.—Feb. 19.—For Reconstruction of Damaged Portion of Pier. Mr. John J. Webster, Engineer, 39 Victoria Street, Westminster.

EAST COWES.—Feb. 26.—For Completion of a Well in Brickwork and Cast-iron Cylinders, and Erection of an Engine-house. Messrs. Lemon & Blizard, Castle Lane, Southampton.

EDINBURGH.—Feb. 19.—For Extension of Offices of the Local Government Board. H.M. Office of Works, 3 Parliament Square, Edinburgh.

EMBLETON.—Feb. 25.—For Building Schools. The Vicar, Embleton.

FILEY.—Feb. 23.—For Construction of Pipe Sewers, Manholes, Lampholes and Cast-iron Outfall to Sea. Mr. J. G. Gofton, Filey.

GREAT YARMOUTH.—Feb. 20.—For New Beer Cellar. Mr. J. E. Teasdel, Architect, 3 Queen Street, Great Yarmouth.

GREYNELL.—March 6.—For Building Board School. Mr. J. Alfred Eggar, Architect, Farnham.

GROOMSPORT.—Feb. 19.—For Building School. Mr. John MacLarnon, Groomsport, Ireland.

HALIFAX.—Feb. 18.—For Building Vicarage. Messrs. Horsfall & Williams, Architects, George Street, Halifax.

HASLINGDEN.—Feb. 16.—For Construction of the following Lengths of Brick Sewers, viz. 1,213 Lineal Yards 3 feet 4 inches Diameter Sewer in 9-inch Brickwork; 1,628 Lineal Yards, 3 feet 6 inches by 2 feet 4 inches in 9-inch Brickwork; 25 Lineal Yards 3 feet Barrel Overflow Sewer in 9-inch Brickwork—2,866 Lineal Yards. Together with Bell-mouth Junction, Overflow and Penstock Chambers, Manholes, and other Works in Connection therewith. Mr. Henry A. Cutler-A.M.I.C.E., Municipal Offices, Rawtonstall.

HAVANT.—Feb. 25.—For Building Cemetery Chapel, Construction Road and Entrance Gates. Mr. A. E. Stallard, Surveyor, West Street, Havant.

HIRWAIN.—Feb. 19.—For Extension of Joint Schools. Mr. T. Roderick, Architect, Clifton Street, Aberdare.

ISLINGTON.—Feb. 21.—For Execution of Works and the Supply of Materials for One Year. Mr. W. F. Dewey, Vestry Hall, Upper Street, N.

ISLINGTON.—Feb. 21.—For Supply of Gas-fittings and Work in Connection with the Maintenance of Lamps and

Columns for Three Years. Mr. W. F. Dewey, Vestry Hall, Upper Street, N.

KENSINGTON.—Feb. 19.—For Excavating and Providing and Laying-on Concrete, 6,596 Square Yards or thereabouts, of Creosoted Yellow Deal, Clean and Squarely Cut of Uniform Size, 9 Inches Long, 3 Inches Wide and 5 Inches Deep, in Pembroke Villas. Mr. Wm. Weaver, Town Hall, Kensington, W.

LANGPORT.—Feb. 23.—For Construction of Waterworks. Mr. J. T. Hawkins, Engineer, Somerton.

LEEDS.—Feb. 22.—For Additions to Primrose Cottage. Mr. T. Butler Wilson, Architect, 12 East Parade, Leeds.

LEEK.—Feb. 23.—For Building Business Premises (Standard Union Rates of Wages for the Workmen). Messrs. W. Sugden & Son, Architects, Leek.

LEWISHAM.—Feb. 25.—For Erection of Split Oak Fencing Entrance Gates, Adjacent Walls, Widening of Road round Park Hospital Estate. Mr. Edwin T. Hall, 57 Moorgate Street, E.C.

LITTLE WOOLTON.—Feb. 25.—For Construction of about 3,600 Yards of Pipe Sewers, with Manholes, &c. Messrs. Wood & Brodie, 3 Cook Street, Liverpool.

LONDON.—Feb. 15.—For the Supply of Folding Chairs for Parks, &c. Mr. H. De la Hooke, L.C.C. Offices, Spring Gardens, S.W.

LOWER TOOTING.—Feb. 25.—For the Erection of a Boundary Wall with Entrance Gates, at Fountain Hospital Estate. Mr. A. Hessel-Tiltman, 6 John Street, Bedford Row.

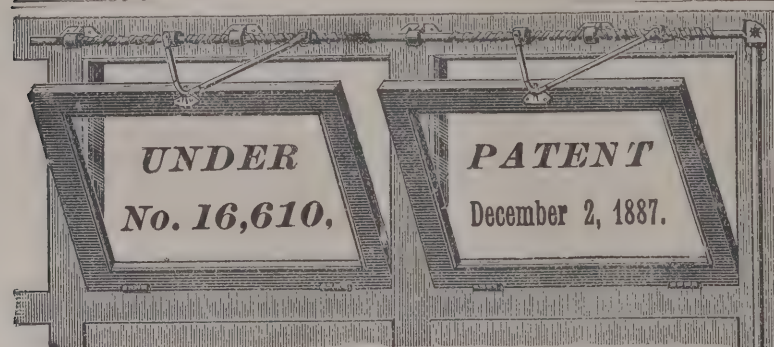
MAIDA HILL.—Feb. 15.—For Erection of a New Postmen's Office. Messrs. Karslake & Mortimer, Old Queen Street, S.W.

NEWCASTLE, CO. DOWN.—Feb. 20.—For Building Three Dwelling-houses. Mr. Henry Hobart, Architect, Dromore, Co. Down.

NEWINGTON.—Feb. 25.—For Supply of Road Materials. Mr. L. J. Dunham, Vestry Hall, Walworth Road, S.E.

NOTTINGHAM.—Feb. 15.—For Building Public Baths. Mr. Arthur Brown, Borough Engineer, Guildhall, Nottingham.

PARLIAMENT HILL.—Feb. 19.—For Construction of a Steel Footbridge. Mr. H. De la Hooke, Clerk to the London County Council, Spring Gardens, S.W.



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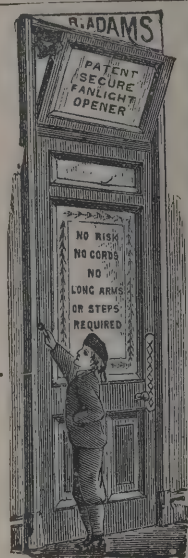
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POPLAR.—Feb. 27.—For Repairing and Paving with Asphalte a Roadway at the Workhouse. Mr. T. Gilloch, 45 Upper North Street, Poplar.

RAYLEIGH.—Feb. 21.—For Building Villa and Stabling Mr. James Thompson, Architect, Cliff Town Road, Southend-on-Sea.

ROYAL PARKS.—Feb. 15.—For Supply of Guernsey Granite, Thames Ballast, Red Pit Sand, Gravel and Cockle-shells. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

SALFORD.—Feb. 18.—For Building Board School. Mr. Henry Lord, Architect, 42 John Dalton Street, Manchester.

SHEFFIELD.—March 6.—For Extension of Court House. Messrs. Flockton & Gibbs, Architects, 15 St. James Row, Sheffield.

STAMFORD.—Feb. 20.—For Pulling-down Tenements and Additions to other Premises. Mr. James Richardson, Borough Surveyor.

STRATFORD.—March 12.—For Erection of a Block of School Buildings. Messrs. Newman & Jacques, 2 Fen Court, E.C.

SOUTHAMPTON.—Feb. 19.—For Heating by Hot Water the Technical Board School. Mr. John H. Blizard, F.S.I., Lansdowne House, Castle Lane, Southampton.

TONBRIDGE.—Feb. 15.—For Additions, &c., for New Kitchen, Boiler-house, &c. Mr. Frank William Stone, Tunbridge Wells, Clerk to the Guardians of Tonbridge Union.

UCKFIELD.—Feb. 25.—For Taking-up and Relaying about 350 Lineal Yards of 18-inch Stoneware Pipe Sewer, Alter and Enlarge Sewage Tanks, Build Sewage Well and Engine House, Provide and Fix Gas Engine and Pumping Machinery, Lay about 450 Lineal Yards of 6-inch Cast-iron Rising Main, with all Valves &c. necessary, also 350 Lineal Yards of 9-inch Stoneware Outfall Sewer, Lay-out and Under-drain the Irrigation Area, Build all necessary Manholes, Valve Chambers. Mr. Wm. Willis Gale, East Grinstead, Sussex.

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and Pans, Ventilating Pipes, Lamp Columns, Cradles and Lanterns; Tools: Shovels, Picks, Forks and Brooms. Mr. Geo. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow.

WALTHAMSTOW.—Feb. 22.—For Making-up and Paving with Concrete Flagging of College Road. Mr. Geo. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow.

WEST HAM.—Feb. 19.—For Supply of Furniture for Three Board Schools. Messrs. J. T. Newman & Jacques, 2 Fen Court, E.C.

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WEST HAM.—Feb. 26.—For Supply of Materials. Mr. Lewis Angell, Town Hall, Stratford.

WOODBIDGE.—Feb. 26.—For Additions to Block D at Isolation Hospital. Mr. Edward L. Lunn, Architect, 36 High Street, Guildford.

TENDERS.

ALNWICK.

For Additions to Prudhoe Villa, Alnwick, for Mr. Jos. Sanderson. Mr. GEO. REAVELL, Jun., A.S.I., Architect.

Accepted Tenders.

G. Davidson, Alnwick, mason	£105	7	6
J. Short & Son, Alnwick, joiner	70	0	0
J. Reavell, Alnwick, plumber	29	17	6
G. Pickard, Alnwick, plasterer	17	16	0
J. Purdie, Alnwick, slater	16	6	8
J. Wallace, Alnwick, painter	7	15	0

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Baker, Newport	£489	0	0
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Willway, Bristol	463	0	0
Edison, Swan & Co., Manchester	444	0	0
Fowler, Lancaster & Co., Bristol	444	0	0
Waring & Sons, Manchester	440	0	0
BALL & Co., Bristol (accepted)	438	0	0

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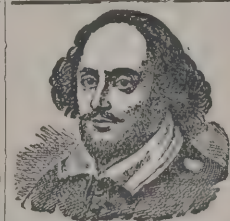
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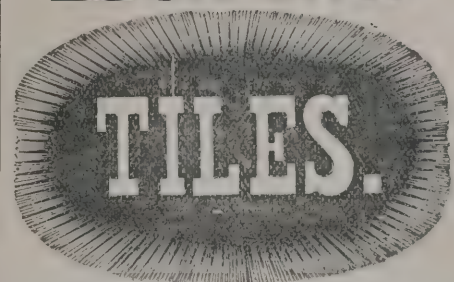
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J. Bowen	4,885	0	0
R. FENWICK (accepted)	4,750	0	0

BALTIMORE.

For Building Small Infirmary at Baltimore, for the Committee of the Father Davis Memorial. Mr. W. H. HILL, F.R.I.B.A., Architect, 28 Southmall, Cork.

W. H. JONES, Dunmanway, co. Cork (accepted) £945 10 0

BUXTON.

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J. Worrall, High Street	1,113	0	0
W. CHAPPELL, London Road (accepted)	1,095	0	0

CANTERBURY.

For Pulling-down Old Premises in St. Radigund's Street, Canterbury, lately used as a Malthouse, Stables and Stores, and Erection upon the Site of Four Cottages. Mr. W. J. JENNINGS, Architect, 4 St. Margaret's Street, Canterbury.

Amos & Foad, Whitstable	£860	0	0
J. J. Hall, Dover	780	0	0
W. W. Martin, Ramsgate	750	0	0
F. T. Gentry, Canterbury	738	0	0
W. JUDGES, Boughton (accepted)	718	0	0

CAERPHILLY.

For Widening and Improving Road between Caerphilly and Senghenydd, for the Caerphilly Urban District Council.

Mr. A. O. HARPUR, Engineer, Council Offices, Caerphilly.

James & Thomley, Penarth	£5,367	15	0
J. Winnel, Aber	2,869	17	0
Jenkin, Brock & Son, Cadoxton	2,702	4	2
J. Lellan, Cardiff	2,235	1	8
R. J. Mathias, Garth	2,195	14	2
T. Harris, Cardiff	2,142	16	8
E. H. Page, Cardiff	2,048	16	8
Barnes, Chaplin & Co., Cardiff	2,042	4	2
Gibbon & Isaac, Cardiff	2,029	18	4
J. Mackay, Newport	1,991	9	0
H. Middleton, Cardiff	1,968	7	10
W. Morgan, Caerphilly	1,959	4	8
Lloyd & Powell, Pontypridd	1,891	0	5
T. Taylor, Pontypridd	1,820	12	6
T. REES, Ely (accepted)	1,801	19	8
D. Love & Sons, Cadoxton	1,771	4	2
Batchelor & Snowden, Cardiff	1,765	10	0
Engineer's estimate	1,996	0	0

CAMBERLEY.

For Alterations and Additions to Clarewood, Camberley, Surrey, for Mr. G. W. Fowler. Mr. HUON A. MATEAR, F.R.I.B.A., Architect.

S. J. WARING & SONS, Liverpool (accepted) . £ 7,000 0 0

DORKING.

For Construction of Boundary Walls, with Entrance Gates, and Formation of Paths at the Dorking Cemetery, for the Dorking Burial Board. Messrs. WHITE & SONS, Surveyors, 18 High Street, Dorking.

L. A. Franks, Guildford	£200	0	0
A. Chalcraft, Dorking	198	10	0
J. Pledge & Son, Dorking	193	15	6
A. P. CLEAR, Dorking (accepted)	189	0	0

DOVER.

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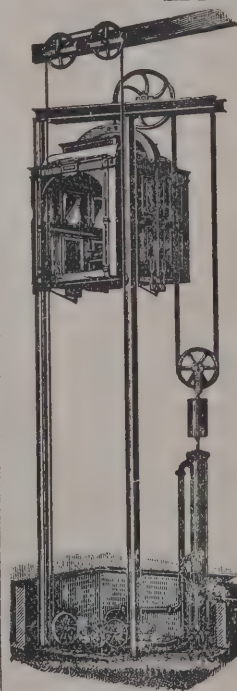
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IPSWICH.

For Three Wooden Hopper-bottom Barges, to Carry 70 Tons each, for the Ipswich Dock Commissioners. Mr. THOS. MILLER, Engineer, 9 Thoroughfare, Ipswich.

Stone Bros., Brightlingsea	£750	0	0
F. Bevis, Mile End, Portsmouth	750	0	0
Forrest & Son, Wyvenhoe	549	0	0
H. Shrubsall, Ipswich	500	0	0
Beeching Bros., Great Yarmouth	450	0	0
Orvis & Fuller, Ipswich	420	0	0
Lee & Son, Rochester	355	0	0
D. RADFORD & Co., Leadenhall Street (accepted)	260	0	0

KING'S LYNN.

For Construction of a New Sewer in Saddlebow Road, with all Necessary Manholes, &c., for the Corporation. Mr. E. J. SILCOCK, A.M.I.C.E., Borough Engineer.

J. W. Cockrell, Gorleston	£752	7	0
W. F. Smith	710	0	0
Girling & Coe, Ipswich	703	0	0
J. Bateman, Sutton Bridge	654	2	1
R. W. Fayen, King's Lynn	619	13	8
R. Clarke, Norwich	580	0	0
H. COLLISON, King's Lynn (accepted)	574	6	0
Engineer's estimate	600	0	0

LONDON.

For Erection of Conveniences at Bostall Heath, for the County Council.

Woolwich and District Co-operative Builders, Limited	£650	10	0
E. Proctor	629	0	0
H. J. Stephens	591	16	0
W. Wells	581	0	0
A. Wallis	580	5	5
R. H. Julian & E. J. Lockyer	499	16	0
C. Godbolt	497	0	0

For Enlargement and Alteration of the Kennington Fire Brigade Station, for the County Council.

Stimpson & Co.	£11,890	0	0
Scharien & Co.	11,875	0	0

LONGPARISH.

For New Footbridge to be Made over the River Test, near Colonel Tippinge's Residence, for the Andover Rural District Council. Mr. G. H. STAGG, District Surveyor, Andover.

H. H. Paice, Andover	£30	0	0
C. W. Bright, Longparish	29	10	0
F. Beale, Andover	29	10	0
A. SPRATT, Wherwell (accepted)	24	10	0

LUTON.

For Two Lodges and Appurtenances on the East and West Ward Recreation Grounds, for the Town Council.

W. G. Dunham, Guildford Street	each	£498	10	0
Sanders & Son, Duke Street	"	495	0	0
G. W. Pryer, Cardiff Grove	"	447	0	0

NEWPORT.

For Rebuilding of 31 Commercial Street, Newport, for Mr. J. Liscombe and Messrs Sharpley & Pritchard. Messrs. HABERSHON & FAWCKNER, 41 High Street, Newport, and JAMES & MORGAN, Charles Street Chambers, Cardiff, Joint Architects.

H. Davies, Cardiff	£982	8	1
Hatherly & Carr, Bristol	967	0	0
W. Lissaman, Chipping Campden	958	0	0
J. Jenkins, Newport	947	0	0
D. Davis, Cardiff	935	0	0
T. Prosser, Newport	933	0	0
T. G. Diamond, Newport	900	0	0
A. S. Morgan, Newport	875	0	0
J. Linton, Newport	875	0	0
C. H. Reed, Newport	850	0	0
T. Westacott, Newport	820	0	0
G. Wilkins, Newport	797	0	0
E. C. Jordan, Newport	796	0	0
D. Parfitt, Newport	787	0	0
D. W. RICHARDS, Newport (accepted)	785	0	0

NOHOVAL.

For Erection of a Bell Turret at Nohoval Church, County Cork. Mr. W. H. HILL, Architect, 28 South Mall, Cork.

W. Barry, Cork	£215	0	0
S. Wakefield, Cork	211	0	0
D. DONNEHEY, Cork (accepted)	196	0	0

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MORLEY.

For Building Villa Residence on Dean Hall Estate, Morley.
Mr. T. A. BUTTERY, Architect, Queen Street, Morley.

Accepted Tenders.

J. & J. Sugden, Morley, mason	£523	13	0
J. Clegg & Sons, Morley, joiner	265	0	0
G. A. Firth, Morley, plumber	79	0	0
J. & W. Bates, Bradford, plasterer	63	0	0
J. Atkinson & Son, Leeds, slater	50	10	0

For Building Villa Residence on Dean Hall Estate, Morley.
Mr. T. A. BUTTERY, Architect, Queen Street, Morley.

Accepted Tenders.

Newton & Asquith, Morley, mason	£520	0	0
J. Clegg & Sons, Morley, joiner	300	0	0
J. Wilby, Gildersome, plumber	83	17	8
J. Atkinson & Son, Leeds, slater	71	17	0
J. Bentley, Howdenclough, plasterer	64	8	0

PENRHIWCEIBER.

For Building Fourteen Cottages, for the Penrhiwceiber Building Club, at Penrhiwceiber.

C. Jenkins & Sons, Porth, Rhondda Valley *	£3,010	0	0
D. Thomas & Co., Cardiff	2,696	0	0
Williams & James, Pontypridd	2,415	0	0
D. Harris, Mountain Ash	2,303	0	0
T. Rees, Canton, Cardiff	2,240	0	0
W. BUDDING, Cefn Tydu (accepted)	2,450	0	0

* Cottages only, £2,730; formation of road in connection therewith, £280.

PLYMOUTH.

For Building Classroom to Household of Faith School, Vennel Street, Plymouth.

W. Repath, Plymouth	£238	17	6
W. T. Egford, Plymouth	223	0	0
E. Perraton, Plymouth	188	0	0
Westlake & Waldron, Plymouth	184	0	0
W. G. Goad, Plymouth	170	0	0
E. Porter, Stonehouse	157	0	0
Roach & Lovell, Plymouth	149	15	0
J. H. Blackell, Plymouth	142	15	0
Pellow & Co., Plymouth	129	10	0
T. A. PEARN & SON, Plymouth (accepted)	124	0	0

PLYMOUTH—continued.

For Re-covering in of Roof of the Old Tabernacle, Exeter Street, Plymouth. Mr. JAMES HARVEY, M.S.A., Architect, 9 Courtenay Street, Plymouth.

Pearn & Sons	£138	0	0
Harvey	133	16	0
Blackell & Shepperd	128	0	0
BLAKE (accepted)	126	0	0

For Alterations and Additions to No. 187 Union Street, Plymouth. Mr. JAMES HARVEY, M.S.A., Architect, 9 Courtenay Street, Plymouth. Quantities by Architects.

Trevena	£512	0	0
Matcham & Co.	496	0	0
Smith & Sons	469	15	0
Good & Co.	467	0	0
Julian	458	0	0
Lethbridge	431	15	0
Pearn & Sons	389	0	0
Palmer	385	0	0
Coles	365	0	0
BLAKE (accepted)	357	0	0

SOUTHEND.

For Building Board Schools, for the Southend-on-Sea School Board. Mr. W. YENDALL HOBBISS, Architect, Southend-on-Sea. Quantities by Mr. F. W. HARRISON.

Baker & Wiseman, Southend	£8,250	0	0
J. W. Steward, Southend	7,916	16	0
Darke & Son, Southend	7,327	0	0
Woodhams, Southend	6,788	0	0
F. SMITH, Southend (accepted provisionally)	6,684	0	0
Architect's estimate	7,280	0	0

STOURBRIDGE.

For Supply during Two Years of about 2,800 Tons of Cast-iron Pipes, varying in Size from 36 Inches to 6 Inches in Diameter, for the Upper Stour Valley Main Sewerage Board. Messrs. E. B. MARTEN, M.I.C.E., & W. FIDDIAN, F.S.I., Engineers, Church Street Chambers, Stourbridge.

Stanton Ironworks Company, Nottingham	£11,820	0	0
Clay Cross Company, Chesterfield	11,712	3	4
Staveley Coal and Iron Company, Chesterfield	11,478	7	4
J & S. Roberts, West Bromwich	11,420	15	6
COCHRANE & CO., Dudley (accepted)	10,442	2	3

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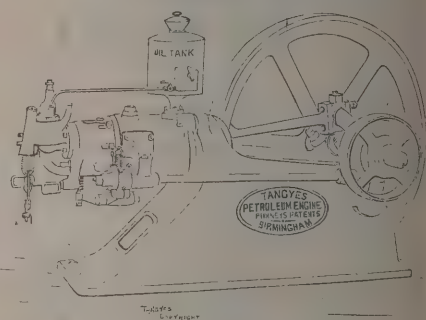
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J. Alexander, Fairfield, Liverpool	£6,712	7	7
W. F. Chadwick, Liverpool	6,291	1	10
J. Keating & Sons, Liverpool	6,215	1	9
J. McCabe, Liverpool	6,096	16	4
L. Marr & Son, Toxteth	5,864	18	8
J. Wilde, Oxford Street, Wavertree	5,396	0	0
Surveyor's estimate	5,849	1	6

WOLVERHAMPTON.

For Building Post Office at Wolverhampton, for the Commissioners of H.M. Works and Public Buildings.

J. Barnsley & Sons	£13,988	0	0
J. Bowen	13,888	0	0
H. Gough	13,770	0	0
H. LOVATT (accepted)	12,850	0	0
H. Willcock & Co.	12,850	0	0
B. Whitehouse	12,641	0	0
R. M. Hughes	12,721	0	0

* Allowance for old material, £100

WOOLWICH.

For Rebuilding 96 Powis Street, Woolwich, and Workrooms in Rear, for Messrs. S. H. Cuff & Co. Mr. H. H. CHURCH, Architect, William Street, Woolwich Quantities by Mr. W. WHINCOP, Kyverdale Road, Stoke Newington, N.

J. Chapman	£2,570	0	0
Young & Lonsdale	2,424	0	0
Munday & Sons	2,418	0	0
H. L. Holloway	2,390	0	0
Balaam Bros.	2,367	0	0
Chessum & Sons	2,253	0	0

WOOLER.

For Building Primitive Methodist Chapel, Wooler, Northumberland. Mr. GEORGE REAVELL, jun., Architect, Alnwick. Quantities by the Architect.

R. Hogarth, Wooler, mason	£248	12	6
W. Allen, Wooler, joiner	203	13	0
T. Smart, Wooler, slater	49	0	0
Wilkin & Dickman, Alnwick, plumber	37	0	0
J. Percy, Alnwick, painter	33	5	0
J. K. Reavell, Alnwick, heating	31	17	6
T. Smart, Wooler, plasterer	25	16	6

VARIETIES.

THE annual dinner of the Birmingham Association of Mechanical Engineers has just been held. In addressing the assemblage, Mr. Jesse Collings, M.P., said he hoped it would always remain a cardinal point with the Birmingham City Council when it wanted professional advice on any occasion—whether law, engineering or anything else—to get the very best they could buy. The only thing that frightened him was evidence of cheese-paring in buying professional advice.

AT Perth a movement has been set on foot with the view of constructing a new bridge across the river Tay.

AT the quarterly meeting of the Warwick Town Council, Alderman Fosbery moved a resolution that it was desirable to construct a new road across the Pigwells to the Saltisford, to demolish the insanitary houses in that neighbourhood, and to erect healthy dwellings in their place, and that a committee be appointed to consider a scheme for this purpose. The resolution was carried and a committee appointed.

THE Doncaster Board of Guardians have decided to purchase a site of 31 acres on which to erect a new workhouse.

AT the quarterly meeting of the Evesham Town Council, the Mayor (Alderman Hunt) said the Council would be glad to hear that at a recent fire the new voluntary fire brigade was found to be competent in the discharge of its duties.

TRADE NOTES.

AT the meeting of the Liverpool City Council the tender of Messrs. J. Paterson & Son, for the new Library and Technical School, was accepted at 10,399/.

MR. T. FREEMAN, of 200 and 202 Phoenix Street, St. Pancras Station, informs us that he has been appointed for seven years the sole agent for the sale of the whole of the building stone quarried at the "Beggar's Well" and the "Battlestead" quarries, the property of Mr. John Fielding, of Alton, Staffordshire. Messrs. Giles, Gough & Trollope, of Craven Street, have specified the "Beggar's Well" stone in the construction of the extensive asylum that the Staffordshire County Council are about to erect at Cheddleton; and the contractors, Messrs. William Brown & Son, of Salford, have given instructions for about 40,000 cubic feet to be quarried.



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The Roman Catholic church of St. Giles, Cheadle, the gift of the Earl of Shrewsbury in 1846 at a cost of 120,000*l.*, from the designs of the late A. W. Pugin, is built of this stone; also that of St. Giles, Newcastle-under-Lyme. Hitherto but little has been sent to London. The railway rate will now, however, enable the "Beggar's Well" to compete with Mansfield & Dumfries. I shall be pleased to give any further information if desired.

WE hear that the Self-Lock Roofing Tile Co. have taken new and more extensive premises at Bow.

THE new workhouse infirmary, Pontefract, is being warmed and ventilated throughout by means of Shorland's patent Manchester stoves with descending smoke-flues and patent Manchester grates, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

WE are informed by the Anaglypta Co., Limited, that their arrangements to manufacture at Darwen are now complete. On and after Monday, February 11, all orders will be executed from their works at Darwen, and all communications to reach them on and after Monday, February 11, should be addressed to "The Anaglypta Co., Limited, Darwen." The experience gained in establishing the business has enabled them to design entirely new works with the latest improvements and increased facilities for the manufacture and despatch of goods.

AN AUSTRALIAN EXAMINATION PAPER.

THE following papers were set for the last Associateship examination of Royal Victorian Institute of Architects:—

Styles of Architecture.

1. Name the five orders of classical architecture and give their principal proportions and leading features, and illustrate the descriptions with sketches.

2. Explain and illustrate by sketches the meaning of the following terms:—Billet, cortile, flèche, loggia, carona, telamones, systile, sgraffito.

3. Give briefly the leading characteristics as to plan, construction and ornament of the Greek, Roman, Romanesque and Gothic periods and give rough sketches.

4. Write a brief description of two of the following buildings, giving the style and dates and names of their architects:—Church of St. Vitale at Ravenna, Cathedral of Pisa, Cathedral at Florence, Library of St. Mark's at Venice.

5. Write a short description of one only of the following buildings:—Salisbury Cathedral, Henry VII. Chapel, Westminster.

6. Sketch the differences in plan and section between the basilican form of churches and the Gothic cathedrals of the late twelfth century.

7. Give a short account of some building designed by Palladio, Inigo Jones and Philibert de Lorme.

8. Name a typical Romanesque church in Germany or France, its date and particular features.

9. Name some representative French cathedral and describe it.

10. As to the accompanying ten photographs, give in each case (a) the style, (b) the county or locality, (c) the order, period or century, (d) explain upon what details or feeling you base your opinion, (e) if you recognise the building give what particulars you can in addition.

Mouldings, Features and Ornament.

1. Drawn to a scale of $\frac{1}{2}$ inch to a foot a Greek Ionic column showing cap and base, lower diameter to be 3 feet.

2. Draw to a scale of $1\frac{1}{2}$ inch to a foot the entablature carried by column above, and write against the various portions thereof the name each bears.

3. Describe the use of the human figure as a decorative feature in Greek buildings, and name the parts of a building in which such decoration was usually put.

4. What are the leading characteristics of Romanesque mouldings, and from what sources are they derived? Illustrate with sketches to large scale.

5. Describe and illustrate by sketches to large scale the following terms:—Gargoyle, flèche, battlement, dormer, finial, sedilia, machicolation, peristyle, crocket and ballflower.

6. A doorway is to be formed in a stone wall 3 feet thick, the opening to be 10 feet wide, drawn to scale of 1 inch to a foot, the arch-mould and plan of jamb (a) in the thirteenth-century Gothic style, (b) in the fifteenth-century Gothic style.

7. Sketch a Gothic buttress, also a flying buttress, and describe the origin and use of the latter. State the period which your sketches represent.

Shoring and Sanitary Science.

1. It is proposed to convert the front of the warehouse, shown in drawings A, into a shop, and to put a cellar extending back 24 feet and the full width of the building and 10 feet high

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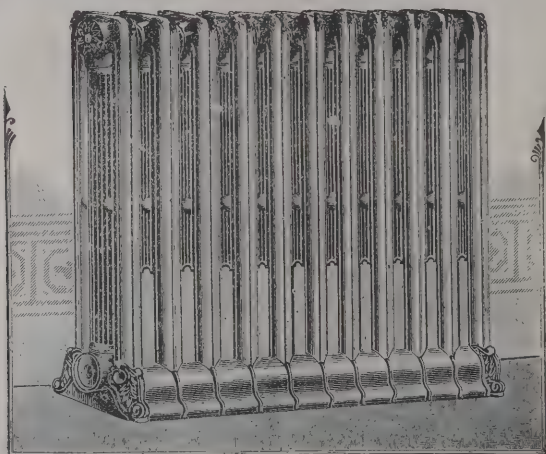
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from floor to ceiling. Describe in order each operation necessary to carry out this work, and illustrate by pencil sketches to scale.

2. When rain-water from the roofs has to be conveyed to the sewers, what precautions must be taken to prevent egress of drain air from the down pipes in very dry weather?

3. As to water-closets. Describe and sketch some of the best types, and state their relative advantages and disadvantages.

4. How are automatic flushes produced? Describe and sketch some of the apparatus, and state under what circumstances their employment is necessary or advisable.

5. What is meant by the term "seal"? What should be the amount? How is it liable to be diminished? How can the latter be avoided? Give rough sketches.

6. Fig. 6 shows a plan of a building with stables at rear, and the w.c.'s, sinks, bath, &c., are marked. Sketch on the plan the various drains, waste-traps, &c., you would adopt, and describe and sketch the various fittings, connections, &c.

7. As to underground tanks, what special precautions must be taken in their construction and in the arrangements of supplies and overflows to avoid pollution of the water?

8. Fig. 8 shows plan and section of a country hall which is detached 6 feet at sides from adjoining buildings. You are required to sketch to scale the exit openings and ventilation you would adopt to comply with the Public Health Regulations.

Nature, Property and Application of Materials.

1. What is the term hydraulicity as applied to limes and cements?

2. What are the constituents of limestone (a) which do not produce hydraulicity; (b) which do produce it?

3. What are the materials used in the suitable proportions for good cement concrete?

4. Describe the principal stones that have been used for building purposes in Melbourne, and mention their relative advantages and defects and any special purpose for which they may be suitable.

5. What are the principal woods used in carpenters and joiners' work in Melbourne? Describe their peculiarities and for what special purposes they can be used with advantage.

6. In connection with painting, explain the meanings of the following terms, and give examples of each:—"Base, vehicle, solvent, drier."

7. For what purposes is concrete usually employed in

buildings? Mention several, and describe the operations of each.

Principles and Practice of Construction.

1. Design a floor having an area of 20 feet by 20 feet and unsupported by columns, but with iron girder construction, and to carry 100 tons equally distributed. Scales:—General drawings 4 feet to 1 inch, detail 2 feet to 1 inch. Submit full calculations for above.

2. Draw a cross section of a Gothic roof for a church nave 30 feet clear in width, and to a scale of 2 feet to 1 inch.

3. Show the construction of a waterproof brick cellar 15 feet by 15 feet, and having a depth from floor-line of ground floor about to surface of cellar floor of 10 feet, and put descriptive notes on drawings. Scale 2 feet to 1 inch.

4. Show details of slate roofing, with lining and battens and eaves, and from eaves to ridge; rafters 10 feet long. Scale 1½ inch to 1 foot.

5. Make detail drawings to a scale of 1 inch to 1 foot of a window 7 feet by 3 feet in an 18-inch brick wall, and with panelled inside linings and external louver shutters.

6. Describe how cement concrete for footings of a heavy building should be formed and put into trenches and prepared for receiving brick foundations, also lime concrete for an ordinary building.

7. Describe the laying of floor tiles and bed for same.

Drawing and Designing, Planning and Arrangements.

1. Subject for design—A band pavilion of the dimensions figured on the skeleton plan in margin where AAA represent the posts; the inner dotted line represents the outer circumference of the brick or stone foundation-wall. The line BB represents the extreme size of the floor, &c., the outer dotted line, the extreme projection of the eaves. Height from surface of ground to floor to be 3 feet; height from floor to eaves to be 12 feet. The construction to be of wood except foundation-wall, which is to be of brick or stone, and ties of roof principals which may be of iron. The steps to be of wood. The roof to be open with central lantern or cupola. The material for the roof's covering to be at the option of the candidate. The following drawings are required:—Plans for floor and roof, elevation, sections on the square and on the diagonal. The above to be to ½ inch or ¼ inch scale, also details of the various parts to ½ inch or 1 inch scale.

2. Fig. 2 is the copy of the aspect compass from Kerr's "English Gentleman's House" indicating the character of the weather and extent of the sunshine, &c., for various aspects in

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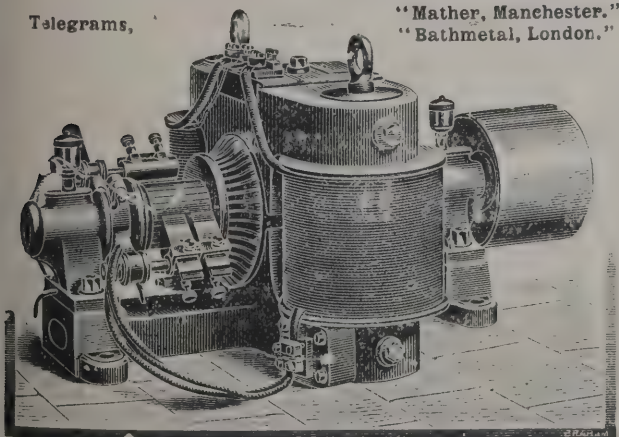
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England. Draw a similar compass for Melbourne as nearly as you can judge.

3. In planning a study in (say) a clergyman's house, what considerations should guide you in determining the best positions for door, windows and fireplace?

Write a specification for the carpenters' and joiners' work of the pavilion you have just drawn; also of the trade required for roof covering you adopt.

Quantities and Estimates.

1. What are the standard measurements of the following work:—(a) rubble, (b) ashlar, (c) floor timbers and flooring, (d) asphalt with concrete underneath, (e) concrete in footings, (f) timber in roof principals?

2. In quantity surveying explain the meaning of the following terms, and give example of each:—Quantities, squaring, abstracting, billing, schedule.

3. In sketch plan of wood addition given below, take out the quantities and material in walls and roof, and show method of calculating same. Walls, 3 feet by $1\frac{1}{2}$ inch, studs 16 inches centres; plates, 4 inches by 2 inches; blocks, 4 inches by 4 inches, R G 3 feet centres; roof, lean-to constructed with $5\frac{1}{2}$ inches by $1\frac{1}{2}$ inch rafters, 16 inch centres and covered with corrugated iron.

Professional Practice.

1. State in detail the usual terms of payment to contractors during progress of works and on completion, and distinguish clearly between the effect of the different forms of certificate.

2. In the case of there being a discrepancy between the drawings and specification, what course is usually followed, and what are the rights and duties of the architect, owner and contractor respectively under the circumstances?

3. In the case of an owner requiring large extra works on a contract, what steps would you take to have same executed, and what do the contract conditions provide for the protection of the owner and contractor respectively?

4. What are the rights, duties and liabilities of the architect of a building under the contract?

5. Into how many classes does the Melbourne Building Act divide proposed buildings? Give particulars of each. What

steps would you take to insure compliance with the Act (a) in the case of a set of offices, (b) in the case of a public hall, and what differences of requirements and procedure is there likely to be in the cases?

6. In the case of a proposed hospital, what requirements in the Public Health Act must you comply with, and with what special information must you supply them?

Practical Geometry and Perspective.

1. Define a sector, chord, segment, arc of a circle.

2. Define a parallelogram, a trapezoid, trapezium. Give examples.

3. Show the method of drawing the following polygons on a given straight line, 1 inch long:—Pentagon, heptagon, octagon.

4. Show the method of dividing a straight line with any number of equal parts. Erect a perpendicular at the centre and at the end of a given line. Draw a circle which shall pass through the three points of a triangle. Describe a square which shall be equal to two given squares.

5. Construct a Gothic trefoil and cinquefoil in a circle 5 inches in diameter.

6. Draw an elliptical arch having a span of 6 feet and a height of 2 feet, and show joints in masonry; scale, 1 inch to 1 foot.

7. Draw a mitre section at an angle of 45 deg. of a cornice of which the sketch is a section at right angles to the wall.

8. Draw in isometric projection a cube having each edge 5 inches long, pierced at each side in the centre with a circular pin 2 inches in diameter, and projecting 4 inches beyond each face.

9. Show how to obtain in elevation the lines of the diagonal pointed ribs of an ordinary quadrilateral vault 10 feet square; scale, 1 inch to 1 foot.

10. Draw in perspective the arcade shown in plan, elevation and section on accompanying sketch, and fill in details of mouldings to arch and piers on one opening at each side of angle. Show the method of finding the projections of cornice at angle.

Note.—Question No. 10 must be attempted.

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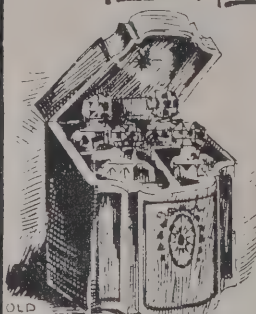
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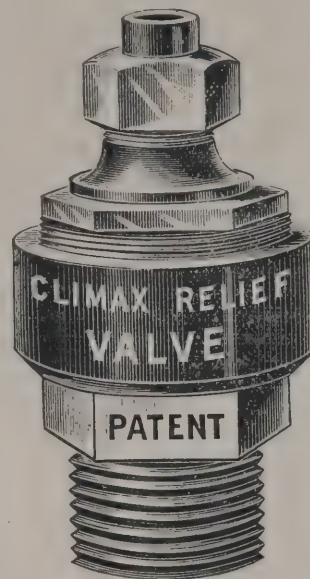
THE AUDITORIUM.—VIEW OF BOXES.—VIEW OF PROSCENIUM.

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PREVENTION OF BOILER EXPLOSIONS.

We have recently examined and adopted for use a very clever and effective arrangement for the prevention of kitchen boiler explosions, and we unhesitatingly recommend its adoption by architects and builders. The frequent reports in the daily papers of fatal kitchen boiler explosions makes the subject a very important one during the present severe frost. But as prevention is better than cure, we urge that such precautions should be taken as will render such accidents at all times impossible. Householders take their apparatus on trust, without having informed themselves how to act when hard and continued frost sets in. The "Climax" relief valve should be adopted for the prevention of explosions in kitchen and other boilers, a most reliable valve supplied by the "Climax" Relief Valve and Filter Company, of 6 and 7 Barbican, E.C. The hot-water apparatus usually fitted is in reality simple. A cistern filled from the main house cistern is placed, as a rule, somewhere in the bathroom, and from this cistern a pipe runs down to the wrought-iron boiler which is built into and forms the back of the grate in the kitchen range. The cold water flows down into the boiler by gravitation, and as soon as the fire is lighted the heated water, being lighter, passes up to the cistern by the return-pipe. Thus the flow and return system is safe so long as there is no stoppage of any sort in the pipes. But directly anything prevents the expansion of the water or the generation of steam, then a rumbling noise heralds the speedy approach of an explosion. Generally it is in the night, while the kitchen fire is out, that the water in the flow and return pipes gets frozen hard, with the result already indicated. The ordinary boiler fitted in most houses, when in place is not readily accessible except by removing part of the back-plate of

the range, and is without any provision for safety when free circulation is stopped. A boiler is fitted with a safety "Climax" valve placed at the extremity of a short length of piping (say 18 inches) screwed into the boiler, and the "blow-off" end is generally run into the chimney. At the warehouses of the Carron Company are several examples of these boilers, and when a safety-valve is ordered they supply what is known as the "Climax" relief valve,



which they have found to work with absolute certainty. There is nothing to get out of order, the valve itself is a piece of mica, and the whole is tested to, say, 50 lb. or 60 lb per square inch, and above that pressure it will blow off, affording the required relief to the boiler. These safety-valves can be fitted to any boiler for an extra cost of about 15s.; but to fit one to a boiler already in position would entail more labour, and the cost would be about 30s. During a hard frost, of course, the water may be prevented from freezing by banking up the fire at night with ashes and small coal, and so keep up a gentle circulation of water all night.

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LIGHT AND AIR CASE.

AN application was made to Mr. Justice North *in re* Wasson & Fawell v. Pawson & Leafs, Limited, to obtain an injunction to restrain the defendants from erecting a building having frontages in Carter Lane and Dean's Court, which it was alleged would interfere with the light and air of a window and fanlight on the ground floor and a window on the first floor of plaintiff's premises, No. 4 St. Paul's Churchyard. It was contended that the obstruction was too far distant, being 80 feet to 90 feet away, the building rising 19 feet 3 inches in one part and 42 feet higher than the old buildings in another position.

The surveyors engaged for the defendants were Mr. E. A. Gruning, Mr. H. H. Collins, Mr. F. Chambers (of Messrs. Chambers & Son), Mr. Herbert Ford, Mr. Hudson (of Messrs. Hudson & Booth), and Mr. Robert Vigers. The surveyors for the plaintiffs were Professor Banister Fletcher and Mr. J. Douglas Matthews. The injunction was granted with costs in action.

SANITARY ASSURANCE ASSOCIATION.

THE fourteenth annual meeting of the Sanitary Assurance Association was held at the offices of the Association, 5 Argyll Place, W., on Monday last. Mr. Henry Rutherford, barrister-at-law, in the chair. Mr. Joseph Hadley, secretary, read the annual report, which stated that the work of the Association continued to be carried on in accordance with the plan initiated by it in 1881. County councils, schools and other authorities continued to seek the services of the Association, and to act on the advice given in the reports, plans and specifications of works furnished by its officers. The council stated that, while recognising to the full the excellent work done by the local authorities in carrying out the Public Health Acts, nevertheless, bearing in mind the deadly nature of sewer air, and our suffering still ensuing from unhealthy condition, they feel that such an organisation as the Sanitary Assurance Association continues to be indispensable.

The income for the year had been 4047, and after meeting all liabilities a balance was carried forward.

On the motion of the chairman, seconded by Dr. K. Macleod, and supported by Dr. Willoughby and Mr. Mark H. Judge, the report was unanimously adopted.

Mr. Roger Smith, professor of architecture at the University College, and Mr. Hy. Rutherford were re-elected members of the executive council.

Dr. K. Macleod was elected president of the Association for the year, and Sir Joseph Fayrer, F.R.S., Surgeon-General Cornish and Mr. Andrew Stirling were elected vice-presidents.

THE CONSTRUCTION OF AN AMERICAN BUILDING.

IN the *Engineering Magazine* for February, which is improving in every quarter, there is, among other important articles, one by Mr. Francis H. Kimball, who, with Mr. G. K. Thompson, designed and superintended the construction of the Manhattan Life Insurance Building—one of the loftiest of the new American class of structures, or sky-scrapers—descriptive of the mode employed in completing it within a brief time. Mr. Kimball writes:—

The temptation to excel some other record in the quick-building line, together with a desire for quick returns from rentals, losing but one season, is more than the investor can withstand. The architect has no choice in the matter; he must accept the inevitable, and bring to bear all his skill to accomplish the end desired in the best and most workmanlike manner.

It is not difficult, at the close of one of these quick-building operations, to trace the reasons which led to so successful a termination.

The most recent example in point of the actual time consumed in erection and in finishing the great bulk of the building—which has not been equalled up to the present time, pound for pound of iron and brick for brick of masonry—is the Manhattan Life Insurance Building, with which the writer is identified.

No comparison can be made between New York and Chicago records, as our building laws are much more rigid, in that they exact a greater degree of stability in the structural features.

In the case of the Manhattan Life Building, the time consumed in its erection may be divided into two parts, as follows:—Foundations ready for superstructure, five and two-thirds months; superstructure, eight months. The roof or eighteenth tier of beams was reached in exactly three months from the time when the foundations were ready, on which to set the first piece of steel composing the bolsters that support the cantilever system.

The time spent in preparing the foundations may seem to

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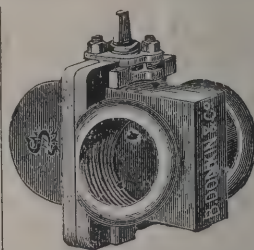
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those unfamiliar with this work scarcely consistent with the progress afterwards made, but the architects found that, in view of the unsatisfactory nature of the ground composed largely of quicksand, the usual methods employed, such as piling or masonry, were inadequate for the purpose of a foundation to sustain the great concentrated loads, and they thereupon decided to reach bed-rock, 57 feet below Broadway, by some unprecedented means. They finally concluded to introduce the pneumatic process used in sinking bridge piers to rock.

Sinking the piers to bed-rock rendered the building independent of any outside operations, either building foundations or tunnels. The fact that they were the pioneers in this undertaking, so far as the application of this principle to building work is concerned, led to much carefulness on the part of the engineers, Messrs. Sooy Smith & Co., in respect to the probable effect on the foundations of adjacent buildings, and that there might be no disturbance of such foundations, by reason of going so far below them, no attempt was made to force this work to the degree attained in bridge-work where operations are carried on in an open country.

The magnitude of the work may be better understood by reducing it to cubic yards of masonry. This substructure, which starts on bed-rock and continues up to the level of the cellar floor, consists of fifteen piers, varying in size from 9 feet in diameter to 21 feet 6 inches by 25 feet square. The caissons made of steel corresponded in size to the piers they sustain, and were 11 feet in height. These caissons were filled with concrete, and contained altogether 1,260 cubic yards. The number of bricks used in the piers amounted to 1,500,000.

From this it may be seen that a good-sized building was sunk out of sight before any part of the superstructure could be begun.

The fact that a new method, with more or less experimental work attending its adoption, had to be devised, and the really large mass of masonry forming the piers, are sufficient excuses for the length of time consumed in this feature of the building. It was a work which in olden times might have taken twelve months. Even the progress attained was due to the fact that three relays, or gangs, of men were employed in sinking the caissons, thus giving the work the benefit of the full twenty-four hours in one day for the entire period of five and two-thirds months, except in the case of the masons, who worked only during regular hours.

Suffice it to say that in three months about 5,800 tons of

steel were raised into position. This was not accomplished, however, without night work. When the foundation work was prolonged to September 1, the prospect of completing the building on May 1 was not promising. A council was held—attended by the building committee, architects and builders—the purpose of which was to incite the builders to greater activity and also to settle upon a plan for beginning and continuing night work until the roof was reached.

This meeting resulted in the institution of day and night gangs of men for the erection of the steel frame; and by reason of the time which, in consequence of the delay in the foundations, the contractors for this branch of the work obtained for the making of the wrought material and the delivering of the same within a short haul of the building, coupled with the fact that great care was taken at the rolling mills in laying out the various members to templates, so that when they were assembled at the building no fitting was required, the work of erection went on without interruption from the beginning to the end. Recalling the incidents of these three months' work, and the system employed to produce the quickest results, it seems that no mistakes were made and that every moment was counted.

To better illustrate the magnitude of the skeleton, I may say that there were girders weighing 40 tons, many columns of 10 and 12 tons each, and cantilevers of 80 tons (in four sections of 20 tons each), the length being 67 feet.

All of these heavy members required special means of transportation; the heaviest girder had to be rolled from the dock to the building by night, the task requiring three nights. It took just twenty minutes to raise it from the street to its position on the second floor.

On account of the great risks where material must be raised 300 feet in the air, and the haste with which the work must be done, the setters of iron and stone work should be picked men with certain qualities, the most prominent of which must be good judgment and steady nerves. It is rarely that serious accidents and even deaths are not recorded against buildings of even less magnitude than the Manhattan Life Building, but, strange to say, in this case there was no loss of life, and but few accidents worth mentioning. The work was greatly facilitated by the use of a travelling frame, with a derrick at each angle, by which material could be easily disposed of as it was raised from the street and placed in its proper position.

It was considered advisable to begin the brick masonry when four storeys of the steel frame had been set in position. This enabled the frame-setters to keep in advance of the other

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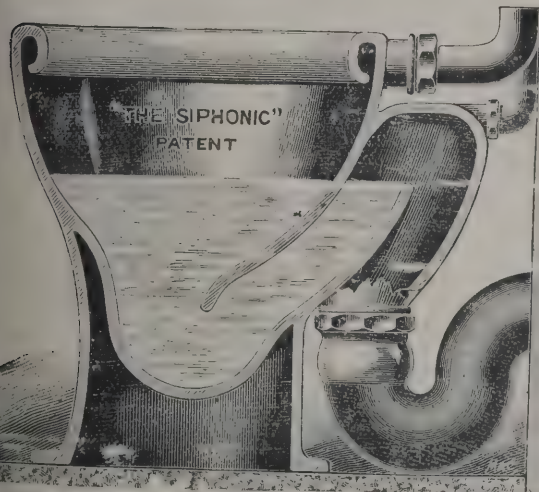
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trades. As far as possible this plan was pursued throughout, but inasmuch as bad weather has no effect on iron and steel, while with masonry the contrary is the case, at times it was necessary to lay off the masons while the others pursued their work. When high winds prevailed all work had to cease. But with good weather, when all could work advantageously, the masons could hardly hold their own.

There seemed to be a friendly rivalry between the two trades as to which should outstrip the other, and the greater the exertion the brighter was the prospect of closing in the building before cold weather set in.

Rough piping both for plumbing and steam began when the masons had reached the fourth storey, and continued without interruption until all the lines, vertical and horizontal, with all their branches, were in position. In the meantime the masons had begun setting the fireproof blocks forming the partitions, and as far as practicable this was carried along with the advancement of the outside walls.

When the partitions of a storey had been set, the electrician ran his wires, enclosed in conduits, to the various fixture outlets. One can hardly realise now that this "roughing," as it is called by the workmen, is concealed from view—that more than five and a half miles of gas, water, waste and vent-pipes, five miles of steam pipes and thirty-five miles of electric wires were required to perfect the respective systems. The facing of the front on Broadway contains about 30,000 cubic feet of stone, which was cut and set in position in eighty days.

It was not at first the idea to undertake to finish more than ten storeys by the first day of May, as the plastering could not be commenced until the winter was well advanced, and the outlook for enclosing the roof seemed distant and discouraging. When the twelfth storey was reached a temporary roof was deemed necessary for the protection from rain and snow of all the storeys below; and such roof was constructed, and was of great help in removing all fear of damage to the finer grades of interior fittings.

Immediately thereafter plastering was begun, temporary heat was supplied, windows enclosed, and a general advancement made towards the completion of the storeys below. There was no cessation, however, in building above this temporary roof. Fortunately the weather was propitious, causing but little delay. The building was permanently enclosed by the time severe weather set in. Then all the forces that could be brought to bear were employed in the supreme effort of getting the entire building in such condition that

tenants could occupy on the first of May any rooms that they might choose. It was successful. It proved a good investment for the company, as the greater proportion of the offices rented were above the sixth storey.

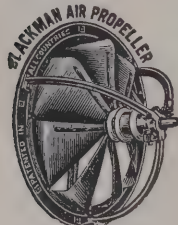
To follow all the different trades and describe the various methods employed to force the work almost beyond the limit of human endurance would be an interesting story. Suffice it to say that to the layman there can be no realisation of the vastness of the undertaking.

Take the laying-out of the engineer's department—the boiler and engine, the electric and elevator plants, the plumbing and heating systems contained in a building of this magnitude, the decorative treatment of the interior, employing the carpenter and cabinet-maker, plasterer, marble-worker and metal-worker (on stairs and elevator fronts), the mosaic and tile flooring, gas and electric fixtures for lighting, to say nothing of a more or less ornamental exterior—and it seems hardly less than a miracle that all these different interests, all large because the building is large, could have worked harmoniously together, and achieved such satisfactory results in the period of eight months.

It might be asked, have manufacturers of building material kept up with the rapid advance in methods of handling, producing articles that will set more quickly, and reducing to the minimum the danger of destruction, such as that from dampness proceeding from brick, plastering and concreting?

If the "drying-out" of a building could be reduced to a few weeks instead of months, the length of time required for its erection would not be so much a matter of uncertainty. Some thought has been given to the mixing and manufacture of plaster, the application of which is made more simple than formerly by certain quick-setting qualities which make it practicable to put on the wood trimming within a few days after a room is white-coated.

There is yet room for improvement in the direction of freeing the process of plastering from dampness, and rendering it less objectionable from the standpoint of cleanliness to those who must follow the plasterers. But there is one feature of the mason's work to which much attention has been paid during the past ten years, but seemingly not in the right direction; for the difficulty remains although the material is harder. I refer to fireproof blocking used for partitions and flat arches between beams. The blocks designed for partitions are not of uniform size; therefore the surface of one side of the partition becomes very irregular, as the mason lays up one side to a line.



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The plasterer must even up with plaster, the thickness of which varies anywhere from half an inch to 1½ inch. It cannot be expected that the shrinkage of plaster will be uniform, to say nothing of the danger of freezing when the work is done in the winter months. Fireproofing of floors between beams consists usually of flat arches formed of terra-cotta blocks made hollow to secure lightness. These blocks do not make up a thickness equal to the depth of the beam, where the beam is more than 8 inches. They vary in depth according to the span between beams; and where the beam is more than 8 inches there is a space above the arch to be filled, in order to meet the material of which the finished floor is composed. This space may be 4 inches, possibly 6 inches—sometimes more, sometimes less, according to the depth of beam. The concrete is generally composed of ashes and cement, especially when saving in weight is important.

Such a foundation is not of the substance required where there is a direct action thereon—as in the case of tile or mosaic floors—proceeding from the heavy and constant traffic usual in business buildings. Consequently such floors show the natural impact of the spongy concrete by numerous cracks, which, in the case of mosaic floors, can never be properly repaired.

This defect is not the only one of importance. A large percentage of the dampness usual in masonwork proceeds from this source. As this concreting is usually done just before the laying of the floors, it is quickly covered in, and dampness must pass through the wood-flooring in the process of drying-out. It is natural to suppose that kiln-dried lumber will absorb much of the dampness, and swell in consequence, so that afterward, when heat is turned on, it will shrink and open at every joint. More thought should be paid to a remedy for this, which may properly be termed a defect. Arches could be made that would reduce the space referred to, thus removing an element which, although it may not materially retard quick building, causes much of the criticism on the defective work (so considered) now credited to rapid methods of building. Other features no doubt enter into this class of building to which attention might be directed with profit to the builder, but it is hardly possible to discuss them in detail here. The individual experiences of others would be interesting and valuable.

Without co-operation on the part of the builder, the architect's suggestions are of no advantage, and the work lags in consequence. It is important, therefore, that none but the most reliable men should be selected to do the work. The

architect, moreover, should make the selection, for if he is to come in for his share of censure in case of delay, it is better that he and his own men should wholly deserve it than that he should suffer for mistakes over which he has had no control. Should the whole work pass into the control of one firm (usually masons), it should be an arrangement satisfactory to the architects.

The architects of the Manhattan Life Building, Messrs. Kimball & Thompson, were ably assisted throughout, and they take great pleasure in publicly acknowledging their indebtedness to the different firms who aided them to make so remarkable a record.

The secret of success always lies in constant, unremitting push in every department. Begin at the very beginning; an ounce of push at the start is worth a pound of push at the end. Start the trades whenever and wherever it is possible so to do, and keep up the tension; then satisfactory results cannot fail to follow.

THE PUBLICATION OF TENDERS.

IN *The Contract Reporter* of the 1st inst., among the tenders was one "For Works in Connection with Construction of New Weir, for the Banks of the Clyde Committee of the Town Council of Glasgow." The publication has been made the subject of a discussion at the last meeting of the Council, as will be seen from the following report in the *Glasgow Herald*:—

It was reported by the finance committee that at a meeting, held on the 25th ult., it was agreed to recommend that the offer of Messrs. Peter M'Kissock & Son, amounting to 21,795*l.* 4*s.* 6*d.*, for foundations and piers of the proposed weir should be accepted. At a meeting, held on the 1st inst., a letter was submitted from Messrs. Borland, King & Shaw, writers, stating that, for the reasons therein mentioned, Messrs. Peter M'Kissock & Son see no alternative but to withdraw their offer for the construction of the foundations and piers of the proposed weir or tidal dam across the Clyde at Glasgow Green. The committee, having had before them the treasurer's report on the five lowest tenders, resolved to recommend that the tender by Messrs. John Paterson & Son, Limited, should be accepted, being the second lowest of the tenders sent in. The amount is 26,104*l.* 0*s.* 6*d.* This price provides for the upper portions of the piers being constructed of freestone instead of granite.



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Treasurer Gray, in moving the adoption of the minutes, said with reference to the construction of the weir, the committee had presented to them seven offers. One amounted to 41,000*l.*, another to 32,000*l.*; the third, that of Messrs. Hugh Kennedy & Son, to 27,438*l.*; the fourth, Messrs. Charles Brand & Son, to 26,681*l.*; the fifth, Messrs. Morrison & Mason, to 26,569*l.*; the sixth, Messrs. John Paterson & Son, to 26,104*l.*; and the seventh, Messrs. M'Kissock & Son, to 21,795*l.* The committee considered that the last offer was abnormally low. The five lowest offerers were remitted to the measurer, and after one or two unimportant alterations had been made they were returned, and the committee agreed to accept the lowest. Since that time the offerers had found that they had fallen into error in making their offer. There was an unfortunate withdrawal of a quotation on which they relied in making their tender, and the next offer was much higher than the one withdrawn. He thought they might have insisted upon the offerers keeping by their offer, but it was, perhaps, as well that this matter should have been discovered in time, instead of at a later date. Something had been said about the figures appearing in the newspapers, but there was a growing feeling in favour of publicity, and that was carried to the greatest extent.

Preceptor Dickson said that he did not think the public were entitled to information as to what was done in committee; they were entitled to get it after the minutes had come to the Town Council. He thought that it was a great pity, especially in contracts of this kind—whoever was the party that revealed them—that they should be communicated to the community at large. They saw the result of it in the minutes. If these contracts had not been made public, in all likelihood the city would have saved 4,000*l.*

Mr. Macfarlane explained that it was after the committee had met and accepted the offer that the figures appeared in the papers, but not until then.

Mr. Martin pointed out that from Treasurer Gray's remarks it might be naturally inferred that it was through the influence of some member of the committee that the estimates for the bridge had got into some particular newspaper. It was not through any person on the bridge committee that the estimates got into the newspaper immediately after the meeting, but it was arranged by the bridge committee at their meeting that their chairman should give the figures to the reporters, who were at the door. The information was not given through any newspaper people having influence.

Mr. W. F. Anderson pointed out that eight or nine months

ago he called attention, on a matter of privilege, to the fact that proceedings in committee were grossly outraged, and now the citizens of Glasgow were compelled to pay 4,380*l.* additional because this information had gone from the committee through some one. The paragraph could not have been picked up in the Square; it must have been given. The estimates of the various contractors must have been supplied to the press. He protested against that matter. He did not care if there was an army of reporters, no matter should get into the public prints until it was first sent to the members. The result of the disclosure of the information in this case had been that the rate-payers had to pay 4,300*l.* extra, because the information was published before the deed was sanctioned by the Town Council and signed.

Baillie A. Murray regarded the question as one beyond the newspapers. At a meeting of the committee he had asked whether the lowest estimate of Messrs. M'Kissock had been accepted by the sub-committee. He was certainly given to understand that it had not, and that it came before them for the first time at the meeting on February 1. Now he found that the estimates were before the sub-committee on January 28. There were present four members. It was agreed to accept the lowest offer. He called attention to the practice of the committees of Town Council. He believed that the rule was—and probably it was right—that no communication should be made to the offerer that his offer was accepted by the sub-committee until the offer had been confirmed at a meeting of Town Council. He was not sure that this was a correct proceeding. It was quite true that an offer accepted by a sub-committee could not be held to have been legally accepted without this confirmation, but as between honourable parties contracting, he believed when an offer was accepted by a sub-committee and intimated on the spot to the offerer he would be bound by his offer. He might escape in a court of law, but he did not think that any honourable offerer would seek to do so on such grounds as those. It was worth the consideration of the Town Council whether an offerer should not receive immediate intimation of the acceptance of his offer. It could easily be seen how by the premature disclosure of information a door might be opened for arrangement between contractors. But while he said this, he was quite satisfied that nothing of the kind had occurred in this case.

Mr. Main wished the letter to be read which stated the points in which the offerer had made mistakes.

The Lord Provost said it did not affect the crux of the

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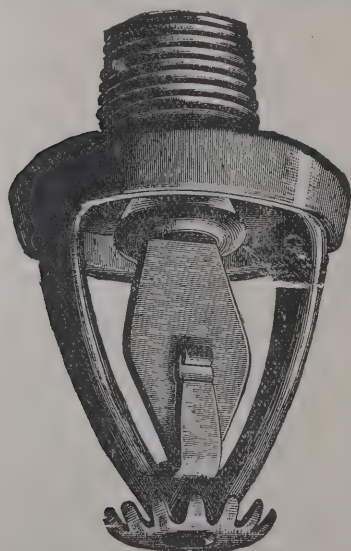
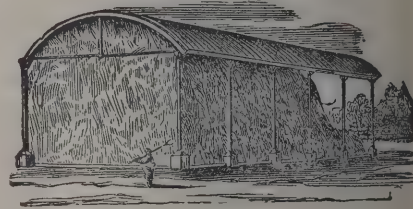
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question. The question was, How was the information given to the press, and the Corporation caused to suffer loss thereby?

Mr. Walter Paton thought the question was whether Messrs. M'Kissock were legally bound to do the work for the sum stated in their original offer. If they were legally bound, he wanted to know why the committee recommended the Council to accept a second offer which was not so favourable to them.

The Clerk (Mr. Monro) did not think it would be wise to say much on the subject at present. Of course the committee had recommended the proper course. He thought Messrs. M'Kissock were entitled to withdraw.

The Lord Provost said they had been advised that the Council not having accepted Messrs. M'Kissock's offer, they were entitled to withdraw.

In reply to a question, the Lord Provost stated that the error in the tender was in the first instance by a sub-contractor for the coffer dam, and in the second by Messrs. M'Kissock themselves for the granite.

Mr. Campbell subsequently said that in order to save the time of the Council it was desirable that the standing orders should be suspended, and that the motion of which he had given notice should be passed.

"That a committee be appointed to inquire into the circumstances under which the various tenders for the construction of the foundations and piers of the proposed tidal weir were communicated to the press before the same were submitted to the Council, and to report whereby a probable loss to the Corporation of over 4,000*l.* has been or may be caused."

Mr. Graham said that as one of the members of the sub-committee he did not object to the appointment of a committee, but he should like to see the scope of the inquiry extended, because there were many matters quite as important as these figures which appeared in the newspapers.

Bailie Alexander Murray said they should confine themselves to the matter immediately before them. If they wished to take up something else that would be done later on.

Mr. Battersby said he had made complaints as to the matter over and over again, and he had been told by gentlemen more deeply interested in giving information than he was, "You can use your own judgment." His conviction was, that if they were to limit the inquiry they were simply leaving scope for information on other subjects being given to the public. They should take up the matter fairly and squarely, and lay down a

distinct principle on which a resolution should be framed, to be acted upon by every member of the Council. As having some connection with the press he stated that he had never given a fragment of information to any newspaper.

Mr. Campbell said he had taken up a specific case, which involved the whole principle on which they could base some general resolution dealing with the whole subject.

The motion was adopted, and the following committee was appointed:—The Lord Provost, Bailies Alexander Murray, Chisholm and Dick; Messrs. Ure, Gray, Crawford, Macfarlane, W. F. Anderson, Graham and Campbell, Mr. Campbell convener.

LIGHT RAILWAYS.

THE following report of the committee of conference of local authorities has appeared:—

The committee have considered the subject referred to them, namely:—

1. How far the usual requirements of the Board of Trade as to constructing and working new railways may fairly be relaxed, especially in the case of lines built through sparsely-populated and agricultural districts.

2. Whether additional legal facilities for obtaining powers to construct tramroads and light railways are necessary or desirable.

They have given special attention to the case of light railways in agricultural districts, and they have also considered tramways and tramroads, as well in rural districts as in urban districts not of the first magnitude, but under this head they have not considered the circumstances of main lines of railway or tramway on which the traffic may be expected to be of great volume. For their guidance they obtained from the Board of Trade the Acts of Parliament and the existing regulations bearing upon the subject, and they consulted with its officers as to the practical effects both of the Acts of Parliament and the regulations upon railway construction and working. They were also furnished by the officers of the Board, by the Foreign Office, and by members of the committee with information upon the subject from abroad. In compliance with a request made to him Sir Joseph Crowe, K.C.M.G., C.B., has sent them an account of the law and practice in France under which land is acquired compulsorily for railways of local interest in that country. The committee consulted those

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GOLD MEDAL, Inventions Exhibition, 1885.

of their number who are acquainted with special divisions of the subject. The information given by Mr. Jackson as to the views of the existing railway companies was supplemented by valuable evidence from Sir Henry Oakley, the honorary secretary to the Railway Association. Upon the information thus acquired, the committee submit the following report:—They find that the existing law in Great Britain specially affecting the construction and working of light railways is mainly contained in the Acts of 1864 and 1868, and the law specially affecting tramways in the Act of 1870. In the case of tramways the law necessitates a confirming Act, even where no compulsory powers of taking land are demanded. Tramroads, as distinguished from tramways, are only dealt with in a Standing Order of the Houses of Parliament. Practically no light railways have been constructed under the general Acts of 1864 and 1868, owing, in part, it is alleged, to the consent of all landowners and other parties beneficially interested, and the absence of opposition from any railway or canal company, being necessary before the Act can be made use of. The mileage of such lines constructed under special Acts has also been inconsiderable. This lack of progress in rural districts has also been in great measure due to the want of latitude left to the Board of Trade by law, and in other cases by the conditions which the Board considered it their duty to impose for the public safety. It has also been stated that obstacles have arisen in the case of tramways and tramroads in consequence of the local authorities requiring conditions which were considered too onerous by the promoters of new schemes. The committee believe that the impediments to construction may be greatly diminished, and that on a large proportion of such lines as are contemplated by their inquiry the regulations which have been enforced with a view to public safety may be considerably relaxed. In the case of lines of small traffic, having few trains in the day and working at a moderate speed, there is little risk compared with that occurring on great trunk lines having numerous sidings and branches, and carrying, at high and varying speeds, a complicated traffic of passengers, merchandise, minerals and cattle, at all hours of the day and night. It seems reasonable that details as to route, width of gauge, fencing, level crossings, bridges, gates, the use of public roads, stations and station requirements, signals, continuous brakes, and many similar matters—unnecessary expenditure on which, taken together, adds greatly to the cost—should differ in different parts of the country, depending in each case upon the nature of the country and the

traffic to be conveyed. The same remarks apply to limitation of speed and regulations for insuring reasonable safety in working. There are several other items involving expenditure, such as the provision for deposit of security, the lodging of plans, advertisements, &c., in which there is room for considerable economy. The committee think that it is not reasonable that undertakings of limited scope, when they are approved of by the locality they are intended to serve, should be forced, as they are now, to have recourse to the expensive tribunal of a Parliamentary inquiry. The committee are of opinion that the recent creation of popular local authorities of various degrees throughout Great Britain opens the door to an escape from the great cost attending applications to Parliament, by enabling powers and responsibilities with reference to the authorisation and control of light lines to be conferred on those bodies, and that the time has arrived for Parliament to consider whether this should not be done, an ultimate appellate jurisdiction being reserved to the Government department charged with the inspection of railways, which, it may be assumed, would be exercised with due regard to the existence of such local control and responsibility. If this were done, the initial cost of construction and the expenses of working could be so greatly reduced that many light railways and tramways, promoted either by independent companies or by the existing lines of railway and tramway, could be undertaken to the great advantage of districts, and especially agricultural districts, at present without satisfactory means of transport. The committee suggest that proposals for the construction and working of such lines should be submitted in the first instance to the County Council (with exceptional provisions as to large municipalities), subject to precautions insuring that the interests of those directly affected are duly safeguarded. In all cases a majority of assents in number and value of owners and frontagers should be required, and in cases of compulsory acquisition of land there should be a power of appeal to the Board of Trade. If any doubt should arise as to whether a proposed line is a light railway, to be dealt with locally, or is a scheme which, on account of its magnitude or otherwise, should properly be dealt with by Parliament, the committee think that the Board of Trade should determine the question. The committee are doubtful whether it would be within the terms of the reference to them, and they refrain from giving an opinion as to whether and, if so, on what conditions, it is desirable that local authorities should be empowered to contribute funds towards, or otherwise take part in, undertakings of this character.



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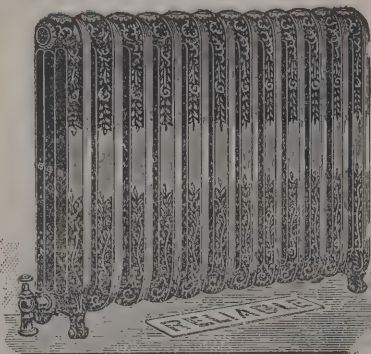
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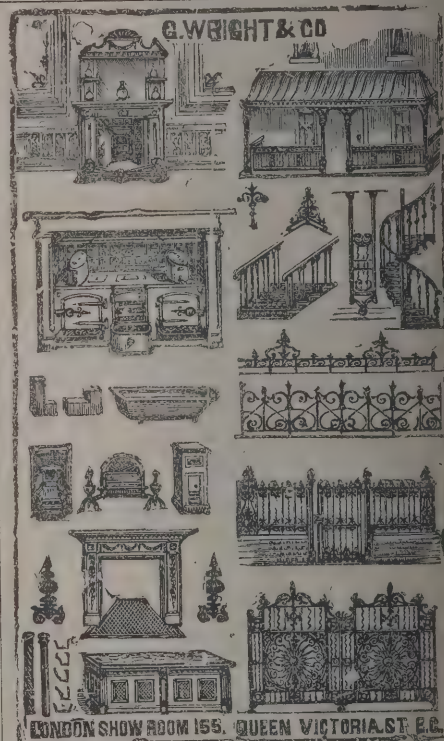
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METROPOLITAN SEWAGE.

THE main drainage committee of the London County Council have reported the result of Mr. J. Parry Laws's and Dr. Andrewes's investigations into the bacteriology of sewage. These investigations showed that if the organisms existing in sewer air were derived from those existing in sewage the bacteria of sewer air should bear a close resemblance to the bacteria of sewage. On contrasting the prevailing organisms of sewage with those of sewer air they were found to bear no resemblance whatever to one another; indeed, so far as the investigators were aware, not a single colony of any of the organisms found to predominate in sewage had so far been isolated from sewer air. Attention was also specially directed to the possible occurrence of the typhoid fever bacillus and the diphtheria bacillus in ordinary London sewage. Therefore every colony which seemed likely to belong to either of these species was the subject of careful investigation. No evidence, however, of their occurrence in ordinary sewage was found. It was pointed out that the failure to find those organisms in ordinary sewage no doubt arose from the fact that the infected material constituted such a minute proportion of the total bulk of sewage discharged by the sewers. The mathematical chances, therefore, of detecting those organisms were exceedingly minute unless they were capable of vigorous growth and multiplication. Realising this fact, search was made for the typhoid bacillus in sewers where it might be expected to exist in much larger proportion. On examining sewage taken from the sewer draining the fever block at the Eastern Hospital, after disinfection had been discontinued for a short period, the existence of the typhoid bacillus was satisfactorily shown—an important fact which had not hitherto been demonstrated. A series of experiments were also made to determine the fate of the typhoid bacillus in sewage, in order to verify or disprove the statement made by many writers that disease germs, such as the typhoid bacillus, found in sewage a suitable soil for their growth and multiplication. On careful investigation it had been found that the bacillus of typhoid fever was not only incapable of any growth and multiplication in sewage, but that after the first twenty-four hours it slowly and surely died out, its ultimate death under natural conditions being a matter of a few days, or at most one or two weeks. If the organisms which existed in overwhelming numbers in sewage did not exist in sewer air, how indefinitely remote was the possibility of the existence of the typhoid fever bacillus in the air of the

sewers? Sewage was, without doubt, a common medium for the dissemination of typhoid fever; sewage-polluted soil might give up germs to the subsoil air; but from the results of these investigations it appeared in the highest degree unlikely that the air of the sewers should play any part in the conveyance of typhoid fever.

RECENT BUILDING IN MANCHESTER.

A VERY great street improvement is the widening of the approach to Oxford Road Station, but to perfect what has been so well begun there is needed, says the *Manchester Guardian*, a skilful and judicious treatment of any new buildings that may be erected on the west side of Oxford Street and adjacent to this approach. The site and circumstances invite a new façade with a handsome entrance and staircase to Oxford Road Station. There is ample space for this, but the designer should be careful to see that any such additions are harmoniously welded into the existing structure. Additions manifestly stuck on, such as the stone doorways to the Rylands warehouse in Oxford Street, a little further to the south, or the King Street doorway work to the Consolidated Bank, are lamentable. Probably the best treatment that we have in Manchester of a comparatively small building occupying a rather difficult corner site is the office of the Scottish Widows, at the south-east corner of Albert Square. Any town or any architect might be proud of it. At the south corner of Whitworth and Oxford Streets is a new and notable building. This is an instance in which twilight improves the effect. Some of the details carry us away for a moment to the Palace of Heidelberg, yet we ask ourselves why should this great pile look so mean and wanting in true dignity, in spite of its height and massiveness? The answer comes readily, because it is more or less of a sham. The mouldings and the ornament are all designed for a stone treatment. It is a stone idea. To cast such features in a mould is a misuse of terra-cotta and a degradation of architecture to what may be called "the wedding-cake style." Terra-cotta makes an excellent servant but a bad mistress. Guided and governed, and above all kept in its place, it is a most useful and effective building material. The last painful additions to the building are two ugly granite tablets, recording the names of the streets, in very common-looking letters, made even vulgar by gilding. Crossing over to the Stockport Road, we come (nearly opposite Devonshire Street) to a brick and

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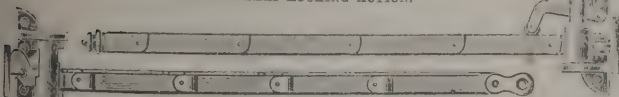
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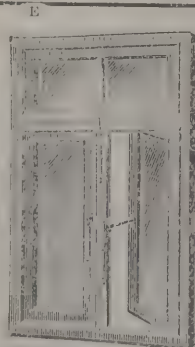
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terra-cotta chapel, fresh and vigorous in its design, and where, with comparatively slight exception, terra-cotta has been duly kept in its place. The whole work suggests economy, but there is nothing mean about it. It possesses the dignity of simplicity, directness of purpose and appropriateness. There is a new block of shops and offices at the south-west corner of Deansgate and West King Street which deserves a word of commendation. The outline and general treatment and the plainness of detail are, for the most part, good. It is unfortunate that the great mass of the chief corner, and far down both streets, seems to be standing on nothing. The supports to which the building owes its very existence are ungenerously kept out of sight and out of mind. Much better contrived are the Imperial Buildings in Cross Street, where the great weight above has adequate support below, without any undue darkening of the shops. It is a great pity, too, that the name and business of the firm which is emblazoned in two broad bands upon the body of the angle turret is not so treated as to be a decoration rather than an eyesore, and so as to be a proper part of the design of the building, instead of appearing as an afterthought, put on, as most shop names and titles are, almost anyhow. Seen from the corner of St. Ann Street or Deansgate, the big skylight stares one in the face unpleasantly. It attracts attention, and when we look we see only what is unsightly. The position is too conspicuous to be thus neglected. We feel regret that a good conception, as this block undoubtedly is, should be so marred by want of painstaking in detail. The Dugdale Chambers block of building in St. Mary's Gate arrests attention, if only by the newness of its stone. The windows seem sensibly treated for light and convenience, without making the front so painfully weak as to excite wonder that it still stands. There is a plainness of detail which is well suited to such a building, such a street and such a city. The general conception of the design, too, is good; but the detail of the centre gable, a good feature in itself, is unrefined and inartistic. The chimneys are not high enough nearly, either for good draught to the flues of the upper rooms or for appearance's sake. Moreover, the design of these chimneys probably looks much better in the drawing than in execution. The main gable and the chimneys especially should have been studied on the spot before being put into work. We should have preferred a little more evident support below to the superstructure, but there is more than is sometimes given in such cases. The worst minor feature is the detail of the fanlight of the street entrance to the chambers. This little bit of detail, which is very much in

evidence, is poor and mean. Generally there is evidence of care and judgment about this façade. It is a pity that all details should not have been well and thoughtfully worked out. The building is not very well joined on to its neighbours. Unsparring pains and trouble and experiments on paper and by model are the only ways to secure graceful fitting in of one building to another. Altogether, we are disposed to welcome this addition to our street architecture, but we regret that a little more care and thought and taste were not bestowed upon some of the details.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 1943. Frederick Rayner, for "An improved casement window-holder or stay."
- 1960. Charles Major, for "Improvements in and connected with fireproof and ventilating floors."
- 1968. Robert Perrot Reid, for "An improved silent door-hook."
- 1995. William Edward Aldous and Frederick Digby Aldous, for "Improvements in ventilators for houses, factories, &c."
- 2049. Frank Beall King, for "Improved door-silencer."
- 2052. Harry Brierley, for "Improvements in sanitary cisterns."
- 2082. Edward Frederick Robertson, for "Improvements applicable to windows."
- 2172. Hugh Donald Fitzpatrick, for "Improvements in locks and latches."
- 2244. William Wall, for "Improvements in sewer ventilators."
- 2268. Samuel Bastow, for "Improvements in windows."

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SPECIAL NOTICE TO THE TRADE AND OTHERS.

[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

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COMPETITIONS OPEN.

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IPSWICH.—March 25.—Designs are Invited for the Building of a Workhouse and Infirmary, with Specifications and Estimate. Premiums 100l. and 50l. Mr. A. F. Vulliamy, Clerk to the Guardians.

LEEK.—March 4.—Designs are Invited for Proposed Covered Markets. Premiums 50l., 25l. and 10l. offered. Right reserved to carry out the Work by the Board's Architect. Mr. C. Henshaw, Clerk to the Improvement Commissioners, Leek.

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ANERLEY.—March 2.—For Additions to School Dormitory, &c. Mr. H. J. Chaldecott, North Surrey District School, Anerley.

ARMAGH.—March 1.—For Wrought-iron Girder Road Bridge. Mr. Joseph Atkinson, junr., Court House, Armagh.

ASHFORD.—March 4.—For Erection of a Board School with Master's Residence and Offices. Mr. H. J. Jeffery, Architect, Ashford.

BALLYMENA.—Feb. 25.—For Building Methodist Church and School. Mr. J. J. Phillips, Architect, 61 Royal Avenue, Belfast.

BATH.—March 5.—For Execution of Work and Supply of Materials for One Year. Mr. C. K. Fortune, 4 Terrace Walk, Bath.

BELFAST.—Feb. 23.—For Building Two Semi-detached Villas, Osborne Park. Messrs. Young & Mackenzie, Architect, Donegall Square East, Belfast.

BELPER.—March 4.—For Enlarging Board School. Mr. Maurice Hunter, Architect, Belper.

BIRMINGHAM.—March 1.—For Works and Repairs to Buildings. Assistant Surveyor, H.M. Office of Works, Penfold Street, Birmingham.

BOURNE.—Feb. 23.—For Works to Board School (Local Tenders only). Mr. Alexander Farr, Clerk, Bourne, Lincolnshire.

BRADFORD.—Feb. 27.—For Reinstating Warehouse. Messrs. Rycroft & Firth, Architects, Bank Buildings, Manchester Road, Bradford.

BRENTFORD.—March 8.—For Two Bathrooms and other Works at Isolation Hospital. Mr. Nowell Parr, Surveyor, Clifton House, Boston Road, Brentford.

BRIGHTON.—March 1.—For Building Technical School. Mr. Francis C. J. May, Borough Engineer, Town Hall, Brighton.

BRISTOL.—March 4.—For Quarrying Stone. Mr. T. H. Yabicom, 51 Prince Street, Bristol.

BROUGHTON.—March 1.—For Erection of a Technical School. Mr. F. J. C. May, M.I.C.E., Town Hall, Brighton.



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BURLEY-IN-WHARFEDALE.—March 6.—For Constructing Settling-tanks, Sludge-pits, &c. Mr. A. E. Preston, 14 The Exchange, Bradford.

BURY.—Feb. 26.—For Alterations and Additions to Caretaker's House at Whitehead Recreation Ground. The Borough Engineer.

CARDIFF.—Feb. 27.—For Forming Streets. Mr. W. Harpur, Town Hall, Cardiff.

CASTLETON.—March 7.—For Supplying Road Materials. Mr. R. J. Webster, Urban District Council, Castleton, Lancs.

CHESTER-LE-STREET.—Feb. 27.—For Providing and Laying Cast-iron Water Pipes, &c. Mr. George Deveron, 24 Bute Street, Low Fell.

CHYANDOUR.—April 2.—For Building Police Station, &c. Mr. Oliver Caldwell, Architect, Victoria Square, Penzance.

CLAYTON-LE-MOORS.—March 4.—For Sewerage Works. Messrs. Brierley & Holt, Civil Engineers, Blackburn.

COLCHESTER.—March 9.—For Supplying Road Materials, Sewer Pipes, &c. Mr. H. Goodyear, Borough Engineer, Stanwell Street, Colchester.

CORFE CASTLE.—Feb. 28.—For Building Schools. Rev. E. H. Greenhow, Corfe Castle, Dorset.

CWMBACH.—Feb. 27.—For Building Six Houses. Mr. T. Roderick, Architect, Ashbrook House, Clifton Street, Aberdare.

DARTMOUTH.—March 2.—For Supplying and Laying Cast-iron Water Pipes, &c. Mr. T. O. Veale, Borough Surveyor, Dartmouth.

DONAGHADEE.—Feb. 22.—For Building Four or Five Houses. Mr. Thomas Pentland, Architect, 81 High Street, Belfast.

DOWNHAM MARKET.—Feb. 27.—For Alterations and Improvements to School. Mr. Harry Wayman, Southery School Board, Downham Market, Norfolk.

DUBLIN.—Feb. 27.—For Building Eight Cottages. Mr. Thomas H. Atkinson, Clerk to the North Dublin Union Rural Sanitary Authority, North Brunswick Street, Dublin.

EAST COWES.—Feb. 26.—For Completion of a Well in Brickwork and Cast-iron Cylinders, and Erection of an Engine-house. Messrs. Lemon & Blizard, Castle Lane, Southampton.

EAST MOLESEY.—March 4.—For Supplying and Delivering Sewer Ventilating Columns. Mr. J. C. Melliss, 264 Gresham House, Old Broad Street, London, E.C.

EAST RETFORD.—March 5.—For Supplying Granite. Mr. J. D. Kennedy, Borough Surveyor, East Retford.

ECCLES.—March 6.—For Supplying Road Materials, &c. Mr. A. C. Turley, Town Hall, Eccles, Lancs.

EMBLETON.—Feb. 25.—For Building Schools. The Vicar, Embleton.

FILEY.—Feb. 23.—For Construction of Pipe Sewers, Man-holes, Lampholes and Cast-iron Outfall to Sea. Mr. J. G. Goston, Filey.

FORFAR.—For Constructing Retort Bench and Settings, &c. Mr. Forbes Waddell, Forfar Gas Corporation, Forfar.

GATESHEAD.—March 6.—For Warming School. Mr. E. J. Harding, School Board Offices, West Street, Gateshead.

GRASMERE.—March 2.—For Alterations and Additions to Rectory. Mr. Robert Walker, Architect, Windermere.

GREAT HARWOOD.—March 4.—For Sewerage, &c., Works. Messrs. Brierley & Holt, Civil Engineers, Blackburn.

GREAT WYRLEY.—March 1.—For Alterations and Additions to Schools. Messrs. Bailey & McConnal, Architects, Bridge Street, Walsall.

GREENWICH.—Feb. 28.—For Supplying Road Materials. Mr. J. Spencer, 141 Greenwich Road, S.E.

GREYNELL.—March 6.—For Building Board School. Mr. J. Alfred Eggar, Architect, Farnham.

HAVANT.—Feb. 25.—For Building Cemetery Chapel, Construction Road and Entrance Gates. Mr. A. E. Stallard, Surveyor, West Street, Havant.

HAMMERSMITH.—March 4.—For Building River Wall. Surveyor, Town Hall, Kensington, W.

HENDON.—March 4.—For Supplying Broken Granite, Limestone, &c. Mr. S. S. Grimley, The Burroughs, Hendon.

HOLBETON.—March 1.—For Building School. Rev. A. T. Allin, Holbeton Vicarage, Ivybridge, Devon.

ILKESTON.—March.—For Supplying Gasholder, &c. Mr. F. C. Humphreys, Gasworks, Ilkeston.

KIDDERMINSTER.—For Extension of Weaving Shed. Mr. J. M. Gething, Architect, Oxford Chambers, Kidderminster.

KEIGHLEY.—Feb. 28.—For New Buildings for the Temperance Society. Messrs. W. & J. B. Bailey, Architects, Bradford.

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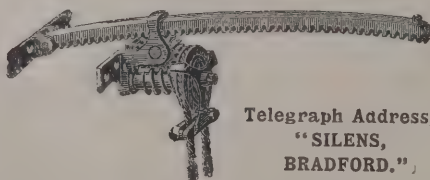
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LANGPORT.—Feb. 23.—For Construction of Waterworks. Mr. J. T. Hawkins, Engineer, Somerton.

LEEDS.—Feb. 22.—For Additions to Primrose Cottage. Mr. T. Butler Wilson, Architect, 12 East Parade, Leeds.

LEEK.—Feb. 23.—For Building Business Premises (Standard Union Rates of Wages for the Workmen). Messrs. W. Sugden & Son, Architects, Leek.

LEWES.—March 4.—For Supplying Road Materials. Mr. Henry Card, County Hall, Lewes.

LEWISHAM.—Feb. 25.—For Erection of Split Oak Fencing Entrance Gates, Adjacent Walls, Widening of Road round Park Hospital Estate. Mr. Edwin T. Hall, 57 Moorgate Street, E.C.

LITTLE WOOLTON.—Feb. 25.—For Construction of about 3,600 Yards of Pipe Sewers, with Manholes, &c. Messrs. Wood & Brodie, 3 Cook Street, Liverpool.

LONDONDERRY.—March 15.—For Building Offices and Alterations to County Court House. Mr. David R. Babington, Secretary to Grand Jury, Shipquay Street, Londonderry.

LOWER TOOTING.—Feb. 25.—For the Erection of a Boundary Wall with Entrance Gates, at Fountain Hospital Estate. Mr. A. Hessel-Tiltman, 6 John Street, Bedford Row.

MAIDSTONE.—March 5.—For Repairing Roads. Mr. Frederick W. Ruck, 86 Week Street, Maidstone.

MORLEY.—Feb. 27.—For Building Temperance Hall and Reading Rooms. Mr. T. A. Buttery, Architect, Queen Street, Morley, Yorks.

NAVIGATION.—March 6.—For Building Schools. Mr. A. O. Evans, Architect, Post Office Chambers, Pontypidd.

NEWINGTON.—Feb. 25.—For Supply of Road Materials. Mr. L. J. Dunham, Vestry Hall, Walworth Road, S.E.

NORMANTON.—For Altering and Enlarging Schools. Mr. William Watson, Architect, Barston Square, Wakefield.

OSWALDTWISTLE.—Feb. 27.—For Alterations and Additions to Public Abattoirs. Mr. R. N. Hunter, Town Hall, Oswaldtwistle.

OTLEY.—For Building Villas. Messrs. Fairbank & Wall Architects, 3 Manor Square, Otley, Yorks.

PADDINGTON.—Feb. 28.—For Pulling-down and Rebuilding Cemetery Boundary Wall. Mr. H. Cecil, Vestry Hall, Harrow Road, W.

PEMBURY.—March 11.—For Providing and Erecting Engine with Two Deep-well Pumps. Mr. T. E. W. Mellor, Town Hall, Tunbridge Wells.

POCKLINGTON.—Feb. 27.—For Enlarging Workhouse. Mr. H. L. Tacon, Architect, 11 Westgate, Rotherham.

POLPERRO.—March 1.—For Building Pier. Secretary to the Harbour Trustees, Polperro, Cornwall.

POPLAR.—Feb. 27.—For Repairing and Paving with Asphalt a Roadway at the Workhouse. Mr. T. Gilloch, 45 Upper North Street, Poplar.

PORTSMOUTH.—March 5.—For Enlarging Post Office. H.M. Office of Works, 12 Whitehall Place, London.

RAMSBOTTOM.—March 4.—For Sewerage Works. Mr. Thomas Nuttall, 12 Market Street, Bury, Lancs.

SHEFFIELD.—March 2.—For Supplying and Erecting Four Oxide Elevators and One Lime Elevator and Conveyer. Mr. F. W. Stevenson, Sheffield United Gaslight Co., Sheffield.

SHEFFIELD.—March 6.—For Extension of Court House. Messrs. Flockton & Gibbs, Architects, 15 St. James Row, Sheffield.

SUTTON.—March 6.—For Draining and Making-up Roads. Mr. Albert D. Greateorex, Council Offices, Sutton.

SWINDON.—Feb. 28.—For Renovating and Decorating Wesleyan Chapel. Mr. R. J. Beswick, Architect, Fleet Street, London.

TENDRING.—March 7.—For Alterations and Additions to School. Mr. J. W. Start, Architect, Cups Chambers, Colchester.

TINTAGEL.—Feb. 28.—For Alterations and Additions to Hotels, &c. Messrs. Wise & Wise, Architects, Launceston.

UCKFIELD.—Feb. 25.—For Taking-up and Relaying about 350 Lineal Yards of 18-inch Stoneware Pipe Sewer, Alter and Enlarge Sewage Tanks, Build Sewage Well and Engine

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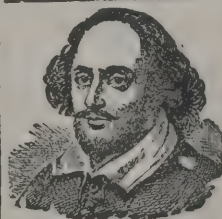
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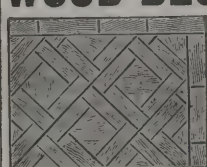
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USHAW MOOR.—Feb. 27.—For Renewing Timber Viaduct. Mr. W. J. Cudworth, North-Eastern Railway Co., Darlington.

WELLS.—March 4.—For Building Cottage Hospital. Mr. R. Isgar, Stuckey's Bank, Wells.

WALTHAMSTOW.—Feb. 22.—For the Supply of Stoneware Pipes, Bends, Saddle Junctions and Gully Pots; Ironwork: Gully Grates, Manhole Covers and Pans, Lamphole Covers and Pans, Ventilating Pipes, Lamp Columns, Cradles and Lanterns; Tools: Shovels, Picks, Forks and Brooms. Mr. Geo. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow.

WALTHAMSTOW.—Feb. 22.—For Making-up and Paving with Concrete Flagging of College Road. Mr. Geo. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow.

WALWORTH.—March 5.—For Building Baths and Wash-houses. Mr. E. B. P'Anson, Architect, 7A Laurence Pountney Hill, E.C.

WARDLE.—March 6.—For Supplying Road Materials. Mr. Frank Greenwood, District Council Office, Wardle, Lancs.

WATFLOO.—Feb. 28.—For Flagging and Resetting Kerb. Mr. F. S. Yates, Town Hall, Waterloo, near Liverpool.

WEST HAM.—Feb. 26.—For Supply of Materials. Mr. Lewis Angell, Town Hall, Stratford.

WILLESDEN.—Feb. 26.—For Road-making and Paving. Mr. O. Claude Robson, Public Offices, Dyne Road, Kilburn, N.W.

WITHINGTON.—Feb. 28.—For Supplying Road, &c., Materials. Mr. A. H. Mountain, Town Hall, Withington, Manchester.

WOODBIDGE.—Feb. 26.—For Additions to Block D at Isolation Hospital. Mr. Edward L. Lunn, Architect, 36 High Street, Guildford.

WOOD GREEN.—March 4.—For Repairing Roads. Mr. F. H. Pownall, Guildhall, Westminster.

WOODSTOCK.—March 2.—For Repairing Roads and Supplying Hartshill Stone. Mr. A. G. Higgs, Wootton Highway Board, Woodstock.

YSTRAD RHONDDA.—Feb. 27.—For Building Thirty Cottages. Mr. William Williams, The Star, Gellidawell, Ystrad Rhondda.

TENDERS.

BLACKBURN.

For Building Eight Houses in Whalley Old Road, Blackburn, for the Daisyfield Co-operative Society, Limited. Mr. JOHN B. THORNLEY, Architect, 45 Market Street, Darwen.

J. Walmsley, Blackburn	£2,540	0	0
J. Whittaker & Sons, Blackburn	2,479	0	0
H. Smith, Blackburn	2,381	0	0
J. Highton & Son, Blackburn	2,334	0	0
W. & A. Gregson, Blackburn	2,322	0	0
J. Parker, Blackburn	2,320	0	0
Lloyd & Millward, Darwen	2,104	0	0
Shuttleworth, Rishton	2,025	0	0

BRISTOL.

For Electric Light at the Guildhall. Mr. F. PROCTOR, Electrical Engineer, Ireland.

Roger Dawson	£1,120	0	0
Newport Electrical Co.	812	0	0
King, Mendham & Co.	778	13	1
Fergus & Co.	693	0	0
Pettit & Hards	645	15	6
Cox-Walker	626	19	0
F. M. Newton	585	0	0
Crompton & Co.	569	0	0
Strode & Co.	517	0	0
Curtis, Hanning & Co.	505	0	0
Baker, Newport	489	0	0
Palmer	474	0	0
Willway	463	0	0
Manchester Ediswan Co.	444	2	6
Fowler, Lancaster & Co.	444	0	0
Waring & Co.	440	0	0
F. W. BALL & Co. (accepted)	438	18	0

DARWEN.

For Extensive Additions to Stores, for the Darwen Industrial Co-operative Society. Mr. J. B. THORNLEY, Architect, Market Street, Darwen. Quantities by Architect.

Accepted Tenders.

J. Knowles, Darwen, masonry and bricklaying	£4,318	0	0
R. Shorrocks, Darwen, joinery and slating	3,149	0	0
H. J. & A. Coulthurst, Darwen, cast and wrought ironwork	452	0	0

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For the Redecoration of the Central Working Men's Club, Keighley Green, Burnley.

T. Preston	£78	0	0
J. Pickthall	69	0	0
F. Gray	69	0	0
D. Stell	65	3	10
J. Smith	58	0	0
J. Edwards	51	0	0
J. Baldwin	51	0	0
R. Smith & Sons	48	0	0
C. SMITH (accepted)	45	0	0
J. Greenwood	39	19	0
L. & J. Hargreaves	36	10	6

CHESTER-LE-STREET.

For Rebuilding of Premises, Front Street, Chester-le-Street, for Mr. T. W. Rowe, of Newcastle-on-Tyne. Mr. H. T. GRADON, Architect, Durham.

Turner Bros., Gateshead	£916	4	9
Wm. Norman, Chester-le-Street	888	0	0
Geo. T. Manners, Durham	809	0	0
J. Jopling, Chester-le-Street	788	9	10
Thompson & Son, Chester-le-Street	787	6	8
John Jennings & Son, Chester-le-Street	780	0	0
Henry Mole, Chester-le-Street	766	0	0
Isaac Oates, Picktree, Chester-le-Street	747	15	0
M. R. Draper & Son, West Rainton	709	16	5
KELL & GROVES, Chester-le-Street (accepted)	706	16	0

CLONES.

For Waterworks at Clones, for the Town Commissioners. Mr. J. H. H. SWINEY, M.I.C.E., Engineer, Avenue Chambers, Belfast.

P. Harvey, Waterford	£4,400	0	0
J. Cunningham, Dublin	4,360	8	3
J. McNally, Cookstown	4,138	16	0
G. Lawson, Glasgow	3,900	0	0
T. J. Dickson, Dublin	3,764	10	3
J. Harvey, Enniskillen	3,688	0	0
G. L. Johnston, Larne	3,498	17	7
Hickson & Peet, Tralee	3,296	10	0
R. Walsh, Limerick	3,272	16	9
J. McLarnon, Belfast	3,248	10	7
M. Green, Belfast	3,218	7	2
MCMAHON & GRAY, Clones (accepted)	2,899	9	7
Engineer's estimate	3,252	0	0

FOLKESTONE.

For Supply of 370 Lineal Yards of Wrought-iron Unclimbable Fencing, for the Corporation. Mr. JOHN WHITE, Borough Engineer.

Ramell & Son, Folkestone	£323	15	0
A. L. Thomas & Sons, Dover	277	10	0
J. Wood, Bradford	277	10	0
Castle Engineering Co., Worcester	226	12	6
Cross & Cross, Walsall	189	12	6
T. L. Fearon, Folkestone	174	17	6
L. Faulkner & Sons, Hersham	169	11	8
Blackwall Galvanised Iron Co.	166	10	0
J. R. Reedman, Canning Town	164	3	9
W. Francis, Folkestone	163	8	4
T. W. Palmer & Co., Westminster	157	5	0
Coalbrookdale Co., Limited, Blackfriars	154	3	4
C. Francis, Folkestone	154	3	4
F. Morton & Co., Westminster	154	3	4
J. Ovenden, Folkestone	154	3	4
Johnson Bros., Limited, Pall Mall	149	10	10
Hill & Smith, Brierley Hill	144	18	4
Bayliss, Jones & Bayliss, Cannon Street	141	16	8
A. & J. Main & Co., Victoria Street	141	16	8

GREAT YARMOUTH.

For Erection of Excursion Train Tavern, North Quay, for E. Lacon & Co., Limited. Mr. JAS. E. TEASDEL, Architect, 3 Queen Street, Great Yarmouth.

Carter & Wright, Yarmouth	£1,304	0	0
R. Eastoe, Yarmouth	1,205	10	0
T. Howes, Yarmouth	1,179	0	0
J. F. W. Bray, Yarmouth	1,168	0	0
A. E. Bond, Yarmouth	1,156	12	11
W. Cork, Yarmouth	1,151	0	0
F. Grimble, Yarmouth	1,135	0	0
H. Wall, Yarmouth	1,134	0	0
Moore & Wright, Yarmouth	1,124	0	0
J. Harman, Yarmouth	1,111	12	0
Read & Curtis, Yarmouth	1,110	0	0
J. W. COCKRILL & SON, Gorleston (accepted)	1,068	0	0

HOVE.

For Roadmaking, Paving and Other Works in Hartington Villas, for the Hove Commissioners. Mr. H. H. SCOTT, Town Surveyor.

J. PARSONS & SONS (accepted)	£445	0	0
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W. H. HOLMAN & Co., Brighton (*accepted*) . £376 0 0

LINCOLN.

For Construction of Filters at the Irrigation Farm, Canwick, for the Corporation. Mr. R. A. MACBRAIR, City Surveyor, Silver Street, Lincoln.

J. Bradley, Lincoln £3,431 19 10
W. Wright & Sons, Lincoln 3,234 8 3
Lansdowne & Sons, Lincoln 3,135 8 0
H. S. & W. Close, Lincoln 3,000 0 0
C. Baines, Newark 3,000 0 0
S. & R. HORTON, Lincoln (*accepted*) 2,979 2 0
Surveyor's estimate 3,108 12 9

LONDON.

For the Construction of 12-inch Pipe Sewers in Rye Road and Surrey Road, The Newlands, Peckham Rye, for the Camberwell Vestry. Mr. O. S. BROWN, Surveyor.

Rye Road.

R. Ballard £235 14 0
T. Adams 236 0 0
H. Cox 228 9 0
J. Jackson 221 9 6
Robertson & Grant 218 11 0
Mayo & Co. 210 17 0
W. H. Wheeler 180 15 0
Killingback & Co. 185 18 0
S. SAUNDERS (*accepted*) 179 0 0
J. Gloag 176 19 0

Surrey Road.

R. Ballard 307 2 0
T. Adams 305 0 0
H. Cox 293 10 4
J. Jackson 284 0 4
Robertson & Grant 281 11 0
Mayo & Co. 271 1 0
W. H. Wheeler 246 17 0
Killingback & Co. 236 16 4
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LONDON—continued.

For Executing Painting and other Works at 39 Lombard Street, for the City Offices Company, Limited. Messrs. F. & H. FRANCIS, Architects.

Bywater £495 0 0
H. Hanks 485 0 0
W. Cubitt 418 0 0
COLLS & SONS (*accepted*) 398 0 0

LLANVIHANGEL GOBION.

For Alterations and Building an Addition to Chapel House, Mozerah, Llanvihangel Gobion. Mr. ROBERT WILLIAMS, Architect, 17 Effingham Road, London, S.E., and Llantrissant.

T. P. Foster, Abergavenny £347 10 0
J. Griffiths 287 17 0
Morgan & Evans, Pontnewynydd 277 17 0
E. G. WATKIN, Abergavenny (*accepted*) 252 0 0

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For Building Public Hall in Newbridge, of Corrugated Iron.

R. C. Harris, London £795 0 0
Croggon & Co., Limited 785 0 0
W. Harbrow, London 679 0 0
North & Son, London 649 0 0
Humphreys & Co., Limited, London 642 0 0
J. Hawkins, Ashford 609 9 0
J. Lysaght, Bristol 605 0 0
E. Williams, Newbridge 605 0 0
Dyne, Steel & Son, Newport 600 14 0
J. Lee, Manchester 596 0 0
Clark & Balmer, Cardiff 595 5 0
W. A. Baker & Co., Newport 595 0 0
F. Morton & Co., Liverpool 585 10 0
W. Glover & Son, Warwick 573 10 0
Clarence Wharf Co, Newport 565 11 6
F. H. Warden, Birmingham 550 0 0
E. F. Blakesley & Co., Liverpool 526 0 0
C. F. MORGAN, Newbridge (*accepted*) 518 0 0
R. Rowsell, Abercarn 490 17 0
C. Bunning, Pontypool 460 15 6
A. P. Colborne, Caerphilly 453 7 6

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Lavatories.

H. Cruttenden	£108	16	0
G. E. Wallis & Sons	103	0	0
T. I. BARDEN (accepted)	93	8	0
Surveyor's estimate	100	9	1

Office.

H. Cruttenden	21	15	0
T. I. Barden	20	2	0
G. E. WALLIS & SONS (accepted)	18	10	0
Surveyor's estimate	19	8	5

A. N. Pryor & Co., for the whole, £137.

For Supply of a Steam Feed Pump for the Workhouse Boiler, for the Guardians.

Dann	£23	15	0
Garrett & Co.	22	10	0
Weekes & Co.	20	0	0
GARDENER (accepted)	18	9	0

NORTH SHIELDS.

For Supply of Whinstone and Broken Slag to District during Year ending March 25, 1896, for the Tynemouth Rural District Council. Mr. JOHN WATERS, C.E., Surveyor, Long Benton, Newcastle-on-Tyne.

M. Appelby, Embleton Quarries	£1,036	2	1
NORTHUMBERLAND WHINSTONE CO. (accepted)	990	12	0

NORTHWICH.

For Erection of Banking Premises for the Manchester and County Bank. Mr. M. K. ELLERTON, Architect, 26 High Street, Northwich.

Stelfox & Carter	£4,050	0	0
Molyneux	4,040	0	0
A. Bostock	3,975	0	0
T. Leicester	3,925	0	0
E. W. Bostock	3,875	0	0
Taylor & Son	3,801	0	0
BECKETT, Northwich (accepted)	3,777	0	0
Ravenscroft	3,720	0	0
Rylance	3,571	0	0
Appleton	3,550	0	0

PAIGNTON.

For Construction of a Storage Reservoir, Two Filters, and other Works connected therewith, for the Paignton Local Board. Messrs. JOHN NEWTON & SON, Engineers, 17 Cooper Street, Manchester.

J. Shaddock, Plymouth	£6,836	4	10
Dixon Bros., Swansea	6,752	12	5
R. Facey, Taunton	6,733	13	6
H. Weldon, Birmingham	6,018	4	3
M. Bridgman, Paignton	6,004	3	7
Thomas & Sons, Camborne	5,879	0	0
S. Morse, Bristol	5,868	0	0
Ambrose & Welch, Bath	5,791	18	5
H. Webber, Paignton	5,518	0	9
E. TEMPEST, Newchurch (accepted)	5,075	2	2
H. P. Rabbich, Paignton	4,840	0	0

PENGE.

For New Warehouses, for Messrs. Payne & Birdseye.

Uland & Nicol	£1,435	0	0
Smith & Sons	947	0	0
Jones	867	0	0
Smith	860	0	0
H. LENEY (accepted)	770	0	0

PLYMOUTH.

For Re-covering in of Roof of the Old Tabernacle, Exeter Street, Plymouth. Mr. JAMES HARVEY, Architect, 9 Courtenay Street, Plymouth.

Pearn & Sons	£138	0	0
Harvey	133	16	0
Blackell & Shepperd	128	0	0
BLAKE (accepted)	126	0	0

For Alterations and Additions to 187 Union Street, Plymouth. Mr. JAMES HARVEY, Architect, 9 Courtenay Street, Plymouth. Quantities by Architect.

Trevena	£512	0	0
Matcham & Co.	496	0	0
Smith & Sons	469	15	0
Good & Co.	467	0	0
Julian	458	0	0
Lethbridge	431	15	0
Pearn & Sons	389	0	0
Palmer	385	0	0
Coles	365	0	0
BLAKE (accepted)	357	0	0

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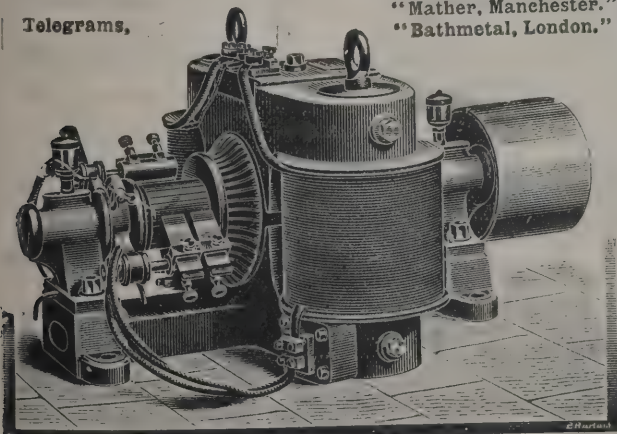
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RIGTON.

For Three Stone-built Houses at Rigton, for Mr. J. A. Denison.
Mr. GEO. RILEY, Architect, Calverley.

Accepted Tenders.

J. Riley & Son, Hosforth, mason, &c.	£375	0	0
J. Barker & Son, Calverley, joiner, &c.	177	0	0
F. & A. Thornton, Eccleshill, slater	43	0	0
L. Routh, Yeadon, plasterer	35	0	0
T. Brearcliffe, Horsforth, plumber	21	0	0
M. Westerman, Horsforth, painter	10	0	0

ROWLEY.

For Building Board Schools in Tump Road. Mr. MEREDITH,
Architect.

J. DALLOW, Blackheath (<i>accepted</i>)	£3,790	0	0
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SOUTHPORT.

For Erection of a Chimney Stack at the Electric Light
Works, Crowlands, Southport, for the Southport Corpo-
ration.

Myles & Wainer, Stalybridge	£2,181	2	0
J. Hamilton, Altrincham	2,152	0	0
H. & A. E. Connard, Southport	1,796	0	0
G. Mulholland, Southport	1,775	0	0
L. & W. Meadows, Stockport	1,739	0	0
C. Dennis, Bury	1,690	0	0
E. Taylor & Co., Littleborough	1,625	0	0
J. Whittaker, Royton	1,560	0	0
R. Holmes, Southport	1,552	9	9
T. Bridge, Jun., Liverpool	1,550	0	0
Buck & Hodson, Southport	1,475	0	0
G. Smith & Co., Southport	1,446	17	0
J. PARTINGTON, Oldham (<i>accepted</i>)	1,420	0	0

ST. BEES.

For Alterations, &c, to the Albert Hotel, St. Bees. Mr. J. S.
MOFFAT, M.S.A., Architect, 53 Church Street, White-
haven.

W. Bradley, Millom	£333	8	4
W. Gradwell, Barrow-in-Furness	331	10	0
Chapple & Son, Moor Row	325	0	0

Note.—Single Tenders were accepted.

SOUTHEND-ON-SEA.

For Building Schools in the Leigh Road, Southend-on-Sea,
for the Southend-on-Sea School Board. Mr. W. Y.
HOBBISS, Architect, Clarence Road, Southend-on-Sea.
Quantities by Mr. F. W. HARRISON.

Baker & Wiseman, Tyler's Avenue	£8,250	0	0
J. W. Steward, Princes Street	7,916	16	0
Darke & Son, Alexandra Street	7,327	0	0
Woodhams, Southchurch Road	6,788	0	0
F. SMITH, 36 Park Street (<i>accepted provisionally</i>)	6,684	0	0
Architect's estimate	7,280	0	0

SOUTH SHIELDS.

For Electric Lighting Works, &c., for the Town Council.
Accepted Tenders.

Indiarubber and Guttapercha Co., Limited, Silvertown, cables and trenching	£4,846	0	0
S. Z. de Ferranti, Limited, London, engines and alternators	3,003	0	0
Black, Hawthorn & Co., Limited, Gateshead, boilers and pipes	1,809	0	0
H. Watson & Sons, Newcastle, pumps	905	14	3
S. Z. de Ferranti, Limited, arc lighting	793	11	0

WAKEFIELD.

For Proposed Houses, Shops and Stabling, Upper Kirkgate,
Wakefield, for Mr. S. N. Woodcock, Wakefield. Mr. E. C.
TATTERSALL, Architect and Surveyor, Wakefield.

Flowers Bros, bricklayer and mason.

Bramald & Broadhead, joiner.

J. Illingworth, slater.

J. Atkinson, plumber.

T. C. Tattersall, plasterer.

Goodall, Lister & Goodall, painter.

G. Batley, whitesmith.

Cost, £1,479.

WALTON-ON-THAMES.

For the Erection of a House, Walton-on-Thames, Surrey, for
Mr. H. Machin. Messrs. INMAN & JACKSON, Architects,
7 Bedford Row, W.C.

Whitehead & Co.	£1,780	0	0
T. C. Watson	1,666	0	0
E. I. Ingram	1,560	0	0
C. Howell	1,514	0	0
James Smith, Walton	1,395	0	0

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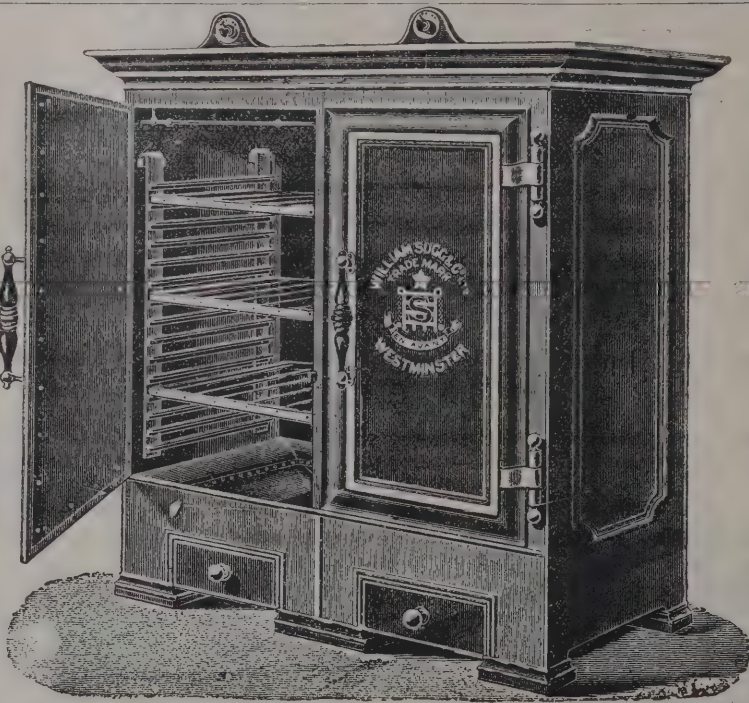
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1a Ludgate Hill, E.C.; 33 Bold Street, Liverpool, &c.

VARIETIES.

At a meeting of the Harwich School Board, Mr. J. W. Start, F.S.I., architect, of Colchester, Clacton-on-Sea, and Harwich, was instructed to prepare plans of schools for 450 children on the main road, and for 350 children on the Bathside, both to be built on the ground floor, with covered playgrounds, lavatories, &c., in the basement. The sites for these schools have very bad bottoms, and will therefore necessitate piling and planking. The clerk was also instructed to advertise for tenders for the Lower Dovercourt Schools, according to plans prepared by the same architect.

THE Town Council of Heywood propose to build a hospital for infectious diseases, and power has been given to the Council to borrow 3,300*l.* for the hospital; 6,500*l.* to defray the cost of road-making, construction of boundary wall, &c.; and 550*l.* to pay for the furniture, fittings, &c. A further application to borrow 500*l.* for the cost of land is refused, because the Board understands that the site is already owned by the Corporation, being purchased for sewage disposal purposes and paid for out of a previous loan.

A MEETING of John Oakey & Sons, Limited, will be held at Cannon Street Hotel, E.C., at twelve o'clock on Wednesday, February 27, to receive the report of the directors and to declare a dividend. Mr. C. G. Oakey, nephew of Mr. Herbert Oakey, the chairman, has been elected to a seat on the board, with the position of deputy managing director.

THE Yorkshire branch of the Society of Medical Officers of Health, meeting at Keighley, discussed the question of the poisoning of water by lead. A resolution was adopted declaring that in the case of moorland water supplies either lead pipes should not be used or means should be taken to prevent the water acting upon the lead.

NOTHING having been done to repair the damage to the Kilkeel pier during the storm last December, the remainder of that structure has just been washed away during a strong south-easterly gale.

At the meeting of the North Berwick Dean of Guild Court, once more the application of Mr. John Macintyre, chemist, for alterations on his property was under consideration, and finally disposed of. The case has been hanging over for a considerable time. The Dean (Provost Whitecross) presided, and Mr. J. B. Lawson (of Messrs. Simpson & Lawson, W.S., Edinburgh) appeared for the petitioner. When originally before the Dean

of Guild Court some time ago, the application was refused, and Mr. Macintyre took the case to the Court of Session. Thereupon it was sent back to be dealt with by the North Berwick Court, on the ground that no reason for the refusal had been given. Subsequently, at a sitting of the Dean of Guild Court, which was not then fully represented, the case was continued for a fortnight. The North Berwick Court had the petition again before it a fortnight since, and it was further continued until the next fortnightly sitting of the court, on the ground that the plan as submitted was not in conformity with the requirements of the Police Act of 1892, and so as to allow of an amended plan being submitted by the petitioner. An additional plan was accordingly submitted at the Dean of Guild Court, and Mr. Lawson was heard in favour of the petition. After some discussion warrant was granted as craved.

THE North Berwick Police Commissioners held a meeting in the Council Chambers—Provost Whitecross presiding—to give opportunity to all persons interested in the drainage scheme adopted by the Board to be heard thereupon. No objectors appeared. The scheme, which is an extensive one, is to be carried out in accordance with plans prepared by Messrs. Belfrage & Carfrae, C.E., Edinburgh, at an estimated cost of 1,300*l.*

A FIRE occurred at Winterborne, near Dorchester, which resulted in the complete destruction of the famous old coaching hotel known as the Coach and Horses, damage to the extent of over 2,000*l.* being done. The conflagration is supposed to have been caused by a defect in a flue. The property was owned by Mr. R. H. Simonds, barrister, and is fully insured.

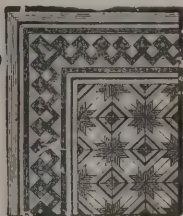
At an adjourned meeting of the Manchester City Council Mr. Alderman Hoy, chairman of the technical instruction committee, moved a resolution authorising application to be made to the Local Government Board for power to borrow 50,000*l.* (in addition to the 100,000*l.* already sanctioned) for the purpose of the new technical schools, and that, subject to such sanction, the tender of Messrs. R. Neill & Sons for the building of the schools at a cost of 141,545*l.* be accepted. The resolution was adopted.

ON Saturday next, the 23rd inst., Messrs. Wm. Densham & Sons, builders and decorators, of St. John's Wood, will give a dinner and social evening to some 120 of their employes, to celebrate the jubilee of their establishment in the building trades.

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One inch and $\frac{1}{2}$ -inch thick.

Immense Stock always ready for Laying.



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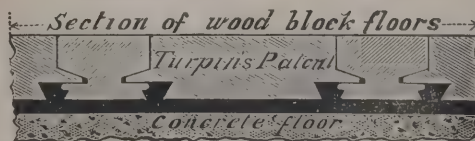
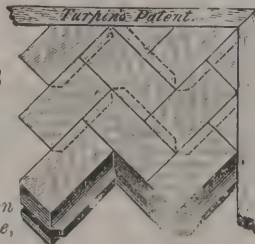
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Telegrams, "IRON, WELLINGBORO."

A SHOE-FACTORY fire broke out on the premises of Messrs. H. Garner & Son, Lower Willow Street, Leicester. The factory is of three storeys, with an extra range of attics lighted by skylights. A little delay occurred at one of the hydrants owing to the frost, and some difficulty was experienced in obtaining access to some parts, but the fire brigade succeeded in preventing the entire premises from being gutted. Owing, however, to the fact that every part of the building was heavily stocked, the aggregate loss was considerable, but is covered by insurance. The fire seems to have originated in the basement, and has thrown about 150 hands idle.

SIR W. D. PEARSON, the contractor, was on Tuesday elected member for Colchester. The Blackwall Tunnel is being carried out by his firm.

THE Edinburgh Town Council have approved of the arrangements proposed by the North British Railway Company for dealing with the traffic during the reconstruction of the Waverley Bridge.

THE first annual general meeting of Rowton Houses, Limited, will be held at 16 Great George Street, Westminster, at twelve o'clock on Wednesday, the 27th inst., to receive the directors' report and statement of accounts, to declare a dividend, to elect auditors and to transact the business of an ordinary general meeting.

ORGANISATION OF BUILDERS IN SCOTLAND.

FOR some time past the question of strengthening their organisation has been under the consideration of several of the leading Master Tradesmen Associations in the larger cities and towns in the country. The movement had its origin with the Edinburgh Master Builders' Association, who proposed that the various employers' organisations throughout the country should be affiliated much after the manner of the existing operatives' societies. With the object of bringing the proposal under the notice of employers in Dundee a deputation consisting of the president, vice-president and another member of the Edinburgh Association visited the city the other day and met the members of the Dundee Builders' Association, which is composed of masons, joiners and plumbers. They fully explained their proposals, and afterwards, says the *Dundee Advertiser*, an interchange of opinion took place. It was then decided that a special meeting of the Dundee Association should be held to consider the matter. This meeting was held in Mathers's Hotel. There was a large attendance, and Mr. Thomas C. Stocks,

the president, occupied the chair. General sympathy was expressed with the proposal of the Edinburgh Association, and the meeting decided to give it their warm support. In accordance with this resolution, the following deputation was appointed to attend a meeting of representatives of Master Associations to be held in Glasgow shortly, when steps are to be taken to form an organisation on the lines indicated:—Messrs. T. C. Stocks, J. B. Hay, Thomas Macaulay, William Bennett, D. P. How and Thomas Craig. Mr. W. Farquharson was also elected to attend the meeting as representing the master plumbers, and it was further agreed to ask the master plasterers to send a delegate. The proposal to have a forty-eight hours week, which is at present agitating trade circles in the Metropolis, was also under consideration. It was decided unanimously to resist the movement, the Association being of opinion that it was in the interests of the public, as well as of those more directly concerned, that the fifty-one hours week should be maintained.

THE RISKS OF HANDY MEN.

ON the 16th inst., Maidwell Hall, Northamptonshire, the residence of Mr. Reginald B. Loder, was totally destroyed by fire. An estate workman was employed in nailing felt to the inside of the roof to keep out the cold and draughts. The man accidentally knocked over the candle with which he was working, the felt became ignited and in a few minutes the flames had spread along the roof to half the house. The man seriously burnt his hands in trying to put out the fire. All the water hydrants with which the house was plentifully supplied were frozen. An ineffectual attempt was made to stay the flames with buckets of water, but in half an hour it was evident the place was doomed. Scores of villagers assisted in removing the furniture, all of which was placed on the snow-covered lawn, and was afterwards removed to the church and other buildings in the vicinity. The fire-engines from Market Harborough and Northampton were telegraphed for, but when they arrived the house was doomed. Only three small rooms at the north-east corner of the building were saved from the flames. The house was built in 1637, and was restored by the late Sir Robert Loder in 1885. It was a three-storey building and measured 150 feet by 120 feet. It was rich in oak paneling and carvings, all of which were destroyed. The furniture is damaged only by removal. The loss is between 15,000*l.* and 20,000*l.*, and is covered by insurance.

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Extract from THE GENTLEWOMAN (Mrs. PANTON).—"You can find all the furniture at Hewetsons', or if you are dubious of your own powers, you could either send me the pretty catalogue to mark, or my daughter could choose them next time she is in town, if you liked. The catalogue should certainly be seen; it is entirely a work of art, and most useful to country residents."

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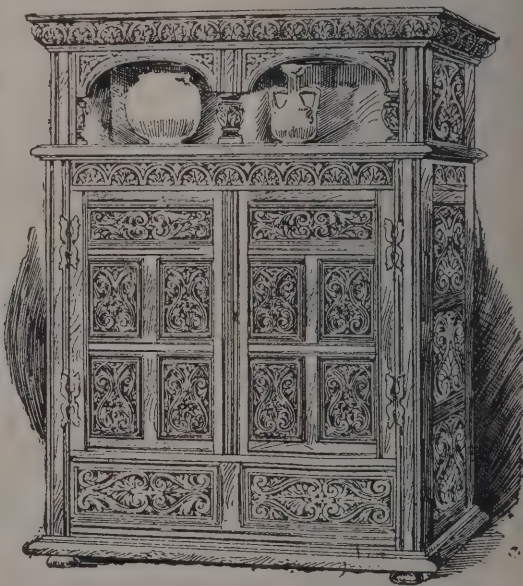
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Replica of an OLD ENGLISH Carved Oak Hall Press, 16th century, 5 feet wide, 7 feet 6 inches high.

ILLUSTRATIONS.

THE RETURN FROM CALVARY.

VILLA RESIDENCE, STOURBRIDGE.

THE GORDON HOTEL AND VILLA RESIDENCES ON THE STOUR-
WOOD BUILDING ESTATE, BOSCOMBE, BOURNEMOUTH.

TRADE NOTES.

In a few days Messrs. Richard Johnson, Clapham & Morris, Limited, will issue to their customers a new catalogue, consisting of about 450 pages, with illustrations of most of the articles they manufacture and sell, such as patent fireproof wire lathing, nails, screws, general wirework, galvanised iron and zinc for roofing, wire fencing, hurdles, wire netting, gas-fittings, general ironmongery, lamps, stamped goods, &c. It will contain, further, six photographs, views in the works and showrooms, as well as colour lists of Messrs. Aspinall's enamel, and many pages of coloured illustrations of bedsteads. This catalogue has been prepared with great labour and care. About seven tons of paper specially manufactured have been used in it. The printing and type are all of the highest quality. The catalogue has a very carefully-compiled index, and contains many pages of useful trade memoranda as to the weights per square foot of metals, the length of different gauges of wire, &c.

AN improved system for the construction of skylights is being introduced by the Paradigm Construction Company, of Great College Street, Westminster, which will prove very valuable for ordinary skylights, greenhouses, &c.

OUR attention has been called by Messrs. Ellis & Co., 23 Strand Street, Liverpool, to the very superior quality of Ellis's asphalt roofing felt. It is 32 inches wide, and made in three qualities, the rolls being 25, 30 and 40 yards respectively. The felt is uniformly even and pliable—does not adhere, tear, or crack in unrolling—is sold by the lineal yard. Felt, being cheap and easy of application, and requiring but light timbers compared with a roof of slates or tiles, makes the most economical roofing yet known. It is admirably adapted for covering corn and hay-ricks, and sheds and stores, for agricultural, manufacturing, or other purposes, workmen's huts,

stables, &c. It is well adapted for the Colonies or foreign countries, dock and quay sheds, &c. Is extensively used in the construction of military camps, storehouses and drill sheds for roofing purposes; it is also useful for resisting the ground damp underneath bedding, stores, &c. Under slates, tiles and metallic roofs, being non-conducting, it is good for keeping buildings cool in summer and warm in winter, and so used for churches, houses, factories, exhibition and other public buildings, makes a more secure roof, repelling the heat and keeping out the wind and dirt; it also serves to deaden sound. Dry hair felt is also used as non-conducting.

THE new schools, Leighton Buzzard, are being warmed and ventilated throughout by means of Shorland's patent Manchester grates, patent exhaust roof ventilators and inlet tubes, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

NOTES ON NOVELTIES.

Maurice's Porcelaine.—This, it is claimed, for walls and woodwork is the best article in the market when a bright and durable finish is required; it is easy to work, and gives a lasting glaze equal to china. For ceilings the white is incomparable, and will keep its colour for years; it has binding qualities that prevent ceilings from cracking. For iron or metalwork of all descriptions it is a protective against corrosion and gives a beautiful finish, and on account of its heat-resisting qualities is in every way suitable for stoves, engines, electrical apparatus, &c. It is suitable for sanitary work, being in itself a sanitary invention giving an impermeable ceramic surface which will resist even hot water. For corridors, baths, w.c.s, lavatories, &c., it is invaluable, being washable and damp-proof. It is supplied ready for use in drums or barrels, and is applied the same as ordinary paint without priming of any kind. Two hundred tints are stocked, or any other colour or tint can be supplied within two hours' notice, or the ivory and white can be tinted with ordinary oil-tinters to any desired shade. Porcelaine is supplied to dry flat when required. Lanfranc Street, Lambeth, S.E., is the address of the Porcelaine Co.

THE quantities are being taken out for the new General Post Office in Dundee, of which Mr. Robertson, of the Edinburgh Office of Works, is architect.

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The Anaglypta Company of all Dealers of all Decorators

Capable of the most artistic treatment

Suitable for all Decorative Purposes

LIBELLING CONTRACTORS.

THE following apology has been published by Mr. Sidney Webb:—"Will you allow me in your columns to express my regret for an unintentional error into which I have fallen? In a recent article in the *Contemporary Review*, on 'The Work of the London County Council,' I referred to the case of the York Road sewer, in which the lowest contractor's tender had been 11,588 $\frac{1}{2}$ %, whereas the main drainage committee executed the work itself for 4,477 $\frac{1}{2}$ % less. I added that it was clear 'that an agreement had been come to by the contractors not to compete with one another for this job.' I have now received from the solicitors of the tendering contractor an explicit denial that he was a party to any such agreement. I had no intention of saying that he was, as I was thinking rather of the contractors who did not tender on that occasion. But the words I used might give the impression that I thought he was a party to the agreement, and I hasten to say that I fully accept his denial, and that I regret that my sentence was not clearer. I have no wish to cast any doubt upon the *bona fide* character of the two tenders sent in, one of which was for 11,588 $\frac{1}{2}$ % and the other for 11,608 $\frac{1}{2}$ %. As a London ratepayer I am, however, all the more glad to think that the Council had the means of doing the work itself, with the result of saving 4,477 $\frac{1}{2}$ %."

HEATING OF CHURCHES.

In a letter to the *Evening Despatch*, of Edinburgh, the Rev. F. L. M. Anderson, of the Rectory, North Berwick, writes:—

I observe Mr. Mackenzie's letter in your paper of this evening's date, in which he says he still sticks to what he wrote in his first letter, and that he knows Grundy's system. In his first letter Mr. Mackenzie said that the hot-air system was as dangerous as the hot water. Now I am pretty sure Mr. Mackenzie cannot have seen Grundy's system working—though he may know it—for if he had seen it he would have at once seen that there cannot be the slightest possibility of explosion, over-heating, or conflagration. In the three unfortunate accidents quoted in your paper of conflagrations—(1) In an Established church at Greenock; (2) in a Free church at Helensburgh; (3) in a U.P. church, I forget where, but where damage was done to the amount of 500 $\frac{1}{2}$ %, and the building (iron) was destroyed—I am nearly sure all these were

caused by over-heated or frozen water-pipes, and I am positive too that, even if the greatest possible care be observed, these explosions cannot be assuredly guarded against, especially in such cold weather as we have been having, and that hot air is much safer than hot water. Mr. Mackenzie is a partner of Mr. Moncur's—a firm which deals in hot-water apparatus—and of course he must stick up for his and his partner's method. It will, however, be very difficult to shake my faith in "hot-air" apparatus, especially Grundy's system, or in the great many advantages they have over hot water; and Mr. Russell, the beadle of Dunfermline Cathedral, confirms my opinion. I and my friends are perfectly satisfied with Grundy's system, and I will have much pleasure in showing its advantages to any one who comes to see it on any Saturday at three o'clock. I am sure it will stand any test. Mr. Grundy writes me saying that he has never had a fire with any of his apparatus, and hopes he never will, as he is sure none could ever occur.

A great many clergymen of all denominations would agree with Mr. Anderson as to the advantages of the Grundy system.

CIVIL AND MECHANICAL ENGINEERS.

At the Civil and Mechanical Engineers' Society Mr. E. H. G. Brewster read a paper on "Water-waste Preventer Cisterns." He first drew the attention of the meeting to the necessity for these, and illustrated this by giving particulars of the quantity of water that would run to waste through small holes, e.g. a hole only one-sixteenth of an inch in diameter in a pipe having a pressure of not more than 45 lbs. per square inch would result in a loss of 648 gallons in a day. Attention was then drawn to the waste preventer cisterns of J. Ashley and T. Binns, patented in 1792 and 1793, or more than a hundred years ago. Waste preventer taps were incidentally touched upon. The modern types of water-waste preventer cisterns were divided into four classes. 1. Tip-up apparatus. 2. Cisterns with inlet and outlet valves only. 3. Cisterns divided into compartments and having more than two valves. 4. Cisterns worked in conjunction with syphons. The latter class was stated to be the one most commonly used at the present time. The "Tower" cistern was particularly alluded to as being one of the simplest and the foremost of the valveless type now very general. The "Paisley" was also described, as were many others. A vote of thanks closed the meeting after a very interesting discussion.

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SANITARY SCIENCE AND FROST.

THE following letter from Dr. Rowand Anderson has just been published:—The present severe and long-continued frost and the discomfort and suffering thereby entailed, especially in the densely-populated districts of our cities, demonstrate this very serious fact, that all our sanitary science is unequal to protecting us from the wretched inconveniences, possible serious sickness and certain destruction to property arising from a severe frost. It is no answer that such a frost as we are now having is of exceptionally long duration. The present aggravated state of matters exists in a greater or less degree whenever frosty weather sets in. Not only, it appears to me, has sanitary science failed to prevent such a state of matters as now exists, but it has ignored and aggravated the sources of danger; and what are called sanitary appliances become nuisances in such weather as we are now experiencing.

The whole system of house sanitation, as developed chiefly by sanitary protection societies, falls far short of what the word protection should imply. It has added greatly to the responsibility of house proprietors, to the complication and cost of plumber-work, and to the disfigurement of our buildings; but in the presence of such weather as we are now having it is helpless, and affords no sanitary protection.

Some of the weakest points in the present system are:—

1. The insistence by sanitary experts that all pipes shall be placed where we see that the frost can so easily attack them.

2. The arrangements for the distribution of hot and cold water throughout our houses requiring pipes to be led in such directions that any accident necessarily leads to serious destruction to property.

3. The want of some simple method of protecting the water supply and service applicable to all classes of houses and tenements. At present the only one resorted to is to waste water at the very time when the supply is restricted.

4. The want of some seemly method of ventilating the soil-pipes and drains without disfiguring the outside of our houses.

I do not wish it to be supposed that I consider sanitary experts alone responsible for the failure of our present system. Architects must bear their share, and so must also the public. The latter, unfortunately, too often understand architecture to mean a mere matter of ornamentation, and not an art that primarily is one of pure utility, and of designing structures thoroughly adapted to the purposes which call them into existence. This must be based on the experience of the past

and the science of the present day, so as to ameliorate all the conditions of life and add to the amenities and comfort of all classes.

When the thaw sets in the destruction and discomfort will be serious; but if the attention of the public is thereby aroused to the necessity for finding a remedy for proved defects much good may be done.

THE ART OF BOOK ILLUSTRATION.

AT Toynbee Hall on Saturday last Mr. Joseph Pennell read a paper on "The Art of Book Illustration," which was illustrated by a number of views. The craving for pictures, said the lecturer, was as old as the world. The cave men who scratched a few lines on an arrow-head or the walls of their caves were the first illustrators. From them to the hieroglyphics of the Egyptians was, after all, but a step. Still, these drawings could not be reproduced, and the earliest examples of illustration in the modern sense of the word were the old block books. The earliest known of these was the picture of St. Christopher. A reproduction of a recent illustration by Sir E. Burne-Jones was placed before the audience, to show the advance in methods which had been made since then. Albert Dürer's work was the perfection of drawing, and Holbein, the first of our caricaturists, was a worthy compeer to him. Rembrandt carried on these traditions worthily, but with Vandyke and Rubens decadence set in. But modern illustration really owed its origin to a great Englishman, Thomas Bewick, who revived the traditions of the greater masters, and even rivalled the greatest of all book illustrators, the Japanese. William Hardy, Thomas Scott and Blake were among the greatest of his successors. About 1830 the French romantic painters followed in their footsteps, but there was one thing of which our nation should be proud, that, although these exquisite drawings were made in France, the wood-cutting itself was done in England by English men and women. The German, the Spanish school, of which Vierge was a brilliant example, and the American, with Vierge and Whistler, the latter in his opinion equal to Rembrandt, had carried the art of illustration to the grand position it now held. It was the one living and fruitful form of art. Oil-painting and Academy pictures might bring fame, but the illustrator of to-day was doing the same work as the great artists of three centuries ago.

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THE EDINBURGH NORTH BRITISH RAILWAY HOTEL.

THE directors of the North British Railway have adopted the designs of Mr. W. Hamilton Beattie for the new hotel and general railway offices which the Company are to erect in Princes Street, Edinburgh, on the site between the North Bridge and the Waverley Market. Mr. Beattie's designs were chosen out of some half-dozen competitive plans submitted to the directors. They show a building which is estimated to cost 221,000*l.*, and which promises to prove one of the greatest architectural ornaments of the city, finely adapted to its surroundings, and combining stateliness and dignity of composition with great elaboration of detail.

In designing a building to please the public eye, says the *Scotsman*, Mr. Beattie had a good deal in his favour in a site as prominent as any in the city, unobstructed by any surrounding buildings and practically four-square, and in the result the building is imposing from any point of view. The style is described as a free treatment of Renaissance, which has given the architect ample scope in the picturesque grouping of windows, gables, turrets and chimneys. The main elevation is in Princes Street. Here we have a frontage of nearly 200 feet, rising six storeys from the street level to a height of over 100 feet at the crown of the roof. This elevation has several distinguishing features. One of these, which gives dignity to the entire building, is the great tower occupying the centre of the façade and rising to a height of 160 feet above the street. The other salient features are the single pavilions which, ending in cupolas at the roof level, flank the tower at each corner of the building, and with the tower have an important function in giving both unity and variety to the design. These are treated with prominent oriels on the lower storeys. The angle pavilions, separated from the main elevation by light-shafted pilasters, are crowned with turrets surrounding the cupolas. The lines of the tower are skilfully carried up beyond the roof by corner pilasters, ending in turrets, and a central turret springing from the midst of these, and ornately finished, crowns the whole. The massiveness of the tower above the roof-level is further relieved by ornamental clock faces. The general treatment of the main elevation is fairly bold on the lower storeys. The first and second storeys have arched windows handsomely grouped in fours on each side of the central tower, mullioned and transomed. In the next two storeys the

windows are square-headed. Above that the treatment is lighter and more ornate. The fifth storey windows are circular. This brings the design to the parapet, and the sixth storey is treated with dormer windows, which have several elegant features. The circular and dormer windows, the tower and the turreted cupolas, and the chimneys well grouped on each side of the tower, all combine to give to the skyline a picturesqueness which is very effective.

The elevation on the other sides is very much in keeping with what has been described. The angle pavilions with their finely designed oriels and turreted cupolas are the same as in the front elevation. To balance these a feature has been made of the gable which projects in the centre of the elevation to correspond with the central tower of the main front. The gable end has been treated with much art, and its windows are designed with greater elaboration to correspond with those of the central tower, and to harmonise with those of the angle pavilions.

While the site offered every advantage with respect to exterior treatment, the nature of the ground presented a good many difficulties in the way of internal arrangements. There is a great fall from the Princes Street level to the railway level of the North British Station, and to accommodate his building to this slope the architect had to make four storeys below the level of Princes Street. These will be dealt with later on. To take first the main floors, it may be repeated that the building being four-square has a central court about 70 feet square, which has simplified the problems of lighting, access and ventilation. The principal public rooms of the hotel occupy the west and north fronts on the level of Princes Street. Public restaurants and bars occupy the north-east corner. The North Bridge front at the ground level is to be chiefly taken up with shops, and the south front is to be occupied by the railway offices. The topmost storeys of the entire block, of course, will form part of the hotel bedroom accommodation.

The main entrance is under the central tower in Princes Street. The entrance hall, 52 feet by 26 feet by 22 feet high, gives access on the west to the grand staircase hall, which is 46 feet by 30. Both are finely designed with pillars, arcading and galleries, and the double staircase itself of white marble, with open arcading dividing it from the hall and with stained-glass windows, is one of the fine features of interior. As a prolongation of the entrance hall, carried across the central court is a reception hall, 58 feet by 20 feet and 20 feet high. This will be a handsome apartment, divided into six bays with

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pillars, well lighted and with a very ornate ceiling. It is expected to form a sort of central meeting place in the life of the hotel. The principal dining-room occupies the centre of the west front. It is 78 feet long and 28 feet wide. It is divided in two with sliding doors, so that in the slack winter season half can be shut off. North of the dining-room in the west angle will be a late breakfast and supper-room, and south of the dining-room will be the smoking-room and gentlemen's writing-room. These rooms will be about 30 feet square. Fronting Princes Street immediately to the west of the entrance hall will be a room 39 feet by 27 feet, designed for public meetings and dinners. On the east of the entrance hall, shut off from the public portions of the hotel, will be the first-class restaurant and the first-class public bar and wine shop, entered from Princes Street and North Bridge respectively. Under the first-class restaurant, below the level of Princes Street, will be the second-class restaurant; and behind these rooms will be the necessary serveries, lifts and other accessories. On the first floor the principal public rooms are again placed in the west wing. The grand staircase will be highly decorated, and the main apartment will be the double drawing-room, placed over the dining-room, in the west front, and measuring 53 feet by 28 feet. North of it will be the ladies' writing-room; and north of that again will be a suite of Royal apartments occupying the north-west angle, consisting of dining-room and drawing-room, two bedrooms, dressing-room and bathroom, and having a private corridor and hall. The royal drawing-room will be a fine room, 30 feet square, with fine oriel windows. There are other private suites on this floor, and a number of the principal bedrooms. Suites of apartments and bedrooms occupy the remaining floors. It will be observed that nearly all the public rooms have an outlook to the west. This gives them a magnificent view along Princes Street and the valley, taking in the picturesque ridges of the Old Town and the Castle. They will be strikingly decorated, a great point in their embellishment being the treatment of the ceilings. The principal apartments will have a height of 22 feet. Along the east and south sides, where it has been considered needless to give so much head-room, a mezzanine floor has been provided, and this floor, on the Bridge Street or east side, has been fitted up with offices, stockrooms and a large commercial-room, it being evidently the intention of the company to make a bid for a share of commercial business.

On the south side of the building has been provided the

accommodation for the railway offices. The entrance is from Bridge Street into a pillared octagon hall. On the main floor will be the general manager's department, occupying the eastern half, and the directors' room, occupying the western half. The Board-room will be a handsome apartment, 30 feet square, having two large oriel windows. The secretary's department is accommodated on the first floor, the solicitor's department on the second floor, and the chief engineer's on the third floor.

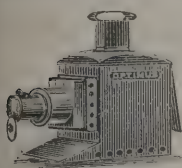
So much for the building above the street level. On the first floor below the street will be billiard-rooms, children's dining and play-rooms, hairdressing-rooms, a few visitors' bedrooms, the second-class restaurant, service-rooms and cellars, with, on the south side, the railway audit department. There is also a lower mezzanine floor for the accommodation of a portion of the staff, where rooms will be fitted up on the cubicle system. The second floor below the street will contain the kitchen and the accessories which this important department of a large hotel requires. The principal kitchen will be 44 feet by 31. There will also be here a despatch room, distributing store, servants' hall and sleeping rooms, and an important feature—a general arrival hall, 46 feet by 28 feet, for passengers arriving by train. Access will be had to this hall from the station platform by hoist or stair. The third floor below the street will provide male servants' sleeping accommodation, the machinery for the heating and ventilating of the hotel, the hydraulic machinery for the lifts, and the boilers for driving it; also the laundry departments and a very completely arranged bakehouse. Finally, on the fourth floor below the street will be boiler-rooms, coal-cellars and paper stores for the railway offices. In all the accommodation will be as follows:—Public apartments, 21; private parlours, 14; bedrooms and dressing-rooms, 295; sitting-rooms and bedrooms for hotel officers and servants, 146; stock-rooms, 10; and administrative apartments, 262—in all 748, not including the shops and offices in the North Bridge and the offices of the North British Railway Company. The estimate includes sums for machinery and plant which the company already possess, so that, excluding these, the sum of 221,000*l.* stated would be somewhat reduced.

The other architects who were invited to send in competitive designs were Dr. Rowand Anderson, Messrs. Dunn & Findlay, Edinburgh, and Messrs. Thomson, Leiper, and Messrs. Burns, Son & Campbell, Glasgow. Messrs. Dunn & Findlay were placed second in the competition.

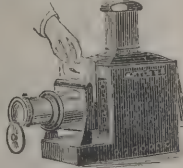
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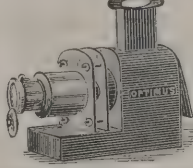
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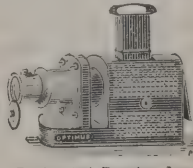
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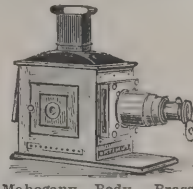
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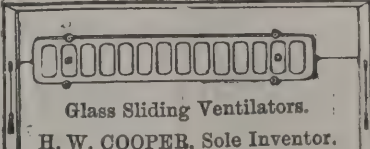
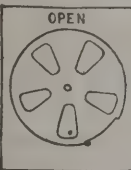
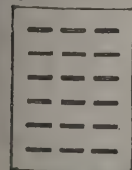
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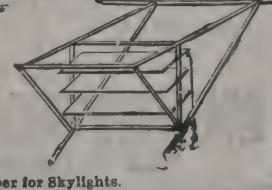
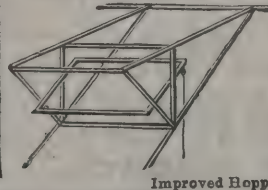
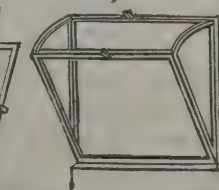
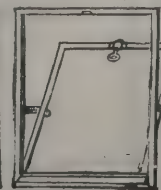
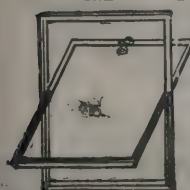


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RECLAMATION OF THE ROMAN CAMPAGNA.

WE have several times noticed the efforts of the Italian Government to insure the sanitation of the Campagna Romana. The benefit that the inhabitants of the Campagna, as well as the inhabitants of the suburban zones and Rome itself, have derived therefrom, have been accurately ascertained by means of special investigations and statistics. On the occasion of the International Medical Congress which was held in Rome in the month of March, 1894, the Ministry of Agriculture presented the results of the investigations along with some tables which showed graphically the degree of malaric infection in various parts of the Campagna. These investigations began in 1888 with the intent of establishing the number of malaria fever-stricken amongst all those persons employed in field work with fixed residence in the tenements existing in the territory. The number per area was ascertained of the agricultural population spread over the country to the right and left of the Tiber separately, distinguishing the inhabitants of the Campagna from those of the suburbs, but all residing permanently on the single tenements. The contingent of malaria-stricken inhabitants during each of the two periods, 1888-90 and 1891-93, was also ascertained and arranged according to the degree of density of population and to the respective proportion for every 1,000 inhabitants.

The amelioration in the sanitary conditions of the district in question during the last three years in comparison with the results of the previous period is self-evident, both as regards the percentage of the fever-stricken as well as the number of persons attacked by the "perniciosa" form of fever, especially in those places where, besides a thorough regulation and a proper preservation of the principal ditches carried out under official control, additional improvements, hydraulic and agricultural, were effected by private landowners, and where the supply of drinkable water was provided.

The percentage of cases of malaric fevers which during the first of the said triennial periods fluctuated from a minimum of 166 per 1,000 in the suburban portion of the zone on the right side of the Tiber, and a maximum of 333 per 1,000 in the Campagna properly called on the left side of the river, fell to a minimum of 105 per 1,000 in the same suburban portion to the right, and to a maximum of 218 per 1,000 in the Campagna on the left of the river.

The "perniciosa" fevers, which during the first three years amounted to 108, of which 34 cases on the left of the Tiber, in

the three years 1891-93 fell to only 41 cases, of which 23 on the right and 18 on the left of the Tiber.

The Italian Government have received some help in their efforts in that direction from the Rome municipality, who placed at the disposal of landlords 100 "oncie" of marcia water (440,000 gallons per diem) at a reduced cost, which can be had at a pressure of from 40 mètres to 65 mètres (43 yards to 71 yards) from various centres of distribution. The municipality have also placed along the aqueducts fountains and troughs for free public use.

The co-operation of landowners if not absolutely deficient is certainly slack in spite of the law; but there are exceptions, especially the Prince Torlonia, who has contributed to provide the Campagna with an important supply of water collected from several springs, which by means of hydraulic power is made to rise to a reservoir placed over one of the old towers called the "Cecchignola," obtaining in that way a pressure of 80 mètres (87 yards). From that level water can be distributed to higher grounds on the left of the Tiber, for which the pressure of the marcia water (71 yards) is not sufficient.

The questions bearing upon the agricultural advance of the "Agro Romano" seem to excite greater public interest in comparison with past indifference, but as regards practical results there is very little to record. The members of parliament for the province have formed themselves into a sort of agrarian group. Meetings are held, resolutions are adopted, appeals are made for legislative or Government aid, but only two points bearing upon the subject need be noticed.

First, with regard to corn-growing, which is the most natural as it is the traditional staple production of the Campagna. In the month of April, 1894, a thorough representative agrarian congress was held in Rome, and on that occasion it was repeatedly and authoritatively asserted, and the matter was made the subject of a formal resolution, that under the present conditions of agriculture in Italy corn-growing resolves itself into a dead loss as long as the price of corn will remain below 25 lire (1*l.*) per quintal, and considering that the fall in the price cannot stop, owing to the special conditions of exporting countries, but that, on the contrary, the fall is persistent, the congress demanded that the import duty on foreign corn be fixed at not less than 9 lire per quintal.

The Rome municipality at the same time adopted a resolution inviting Parliament, in the interests and for the protection of agriculture and of national labour, to vote an increase of the import duty on corn beyond the limit proposed by Government.

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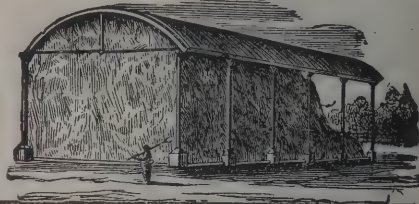
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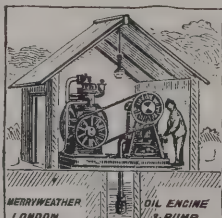
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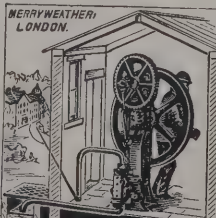
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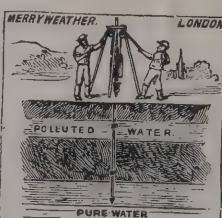
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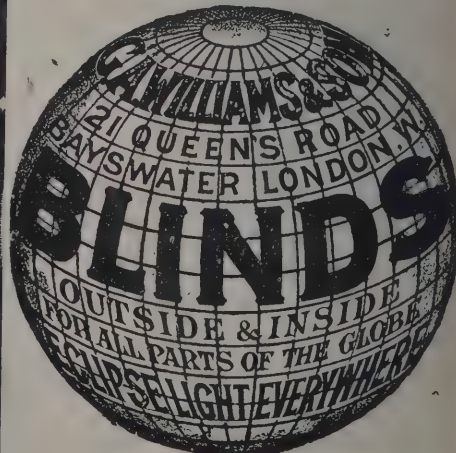
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(7 lire). Parliament, however, resolved to limit the duty to only 7 lire, being an increase of 2 lire per quintal on the former rate.

Another subject which has attracted some attention is the movement in favour of the sugar beetroot cultivation in the "Agro Romano," which would tend to gradually transform at no great expense the system of tillage by alternating two different crops on the same soil, especially so as it is asserted that in France and in Belgium the average yield of wheat in lands under beetroot has notably increased. The number of cattle could also then be augmented, inasmuch as the beetroot supplies two important qualities of fodder, the leaves and the waste pulp after manufacture.

Promising schemes have been made as regards the adaptability of the soil, probable production, cost thereof, sale price and increase of profits to the agriculturist, but they need testing, and the production of beetroot necessitates the erection of sugar factories. After the unsatisfactory results obtained by the factories which were started some years ago at Rieti and at "Castellaccio" it is not very probable that any similar attempts will be made, especially as those amongst the banks who were customary to help industrial undertakings are now helpless, and there is no means of forming a company with sufficient capital in the country. Therefore the movement in favour of the beetroot cultivation in the "Agro Romano" seems, for the present at least, destined to remain a desideratum.

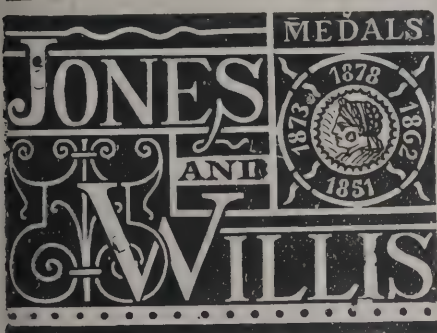
THE ELECTRIC LIGHTING OF EDINBURGH.

A LECTURE by Professor Kennedy, the consulting engineer of the Edinburgh Corporation in the electric lighting of the city, was read to the members of the Edinburgh Literary Institute by the resident engineer. Professor Kennedy explained generally the method of obtaining electrical energy, emphasising the fact that electrical energy was not created, but was only made available by altering its pressure. The earth was the great storehouse of electrical energy, and just as a pump raised water from a reservoir and delivered it at pressure through pipes by which it was distributed over a house, so the dynamo delivered electrical energy under pressure, and it was distributed, as water or gas was distributed, throughout the city to such as required it. Professor Kennedy described and illustrated the methods by which the electrical energy would be generated at the Torphichen Street station; by which it would be sent into

the various districts of the city through trunk mains to the feeding mains, which were either armoured cables laid in the ground or bare copper conductors carried on insulators in culverts; by which from the feeding mains it would be carried to the distributing mains, which were insulated cables laid in fireclay conduits, and by which from the distributing mains it would be made available for public or domestic supply. Touching on the cost of electric lighting, he indicated that with the Board of Trade unit of electricity at 6d., and capable of lighting a 16 candle-power lamp for seventeen hours, and with the lamp costing 1s. 3d., and having a life of 800 to 900 hours, the cost of the light would be about one-third of a penny per hour, which was practically half what it cost two years ago. With gas at its present price, electricity would not be more expensive, provided it was properly switched, so that several lamps would not have to be lit when only one was required, and provided also the light was economically used and not kept burning needlessly. As showing the demand for electric lighting, he mentioned that in London the rate of increase had been 160,000 lamps per annum during the past three years.

FIRE AT BUCKSKIN HALL.

BUCKSKIN Hall, otherwise known as Dacre Lodge, at Cockfosters, between Barnet and Enfield, was on Friday, 8th inst., destroyed by fire. It dates back to Charles II's reign, and was probably a lodge of the forest which formerly surrounded it. The present occupier is Mrs. Gladstone, widow of Mr. Robert Gladstone, of Manchester, cousin of the late Premier. The fire broke out soon after midnight at the top of the house, and, owing to lath and plaster partitions, spread the more rapidly. The fire-engine from Trent Park (the adjacent seat of Mr. F. A. Bevan) did good service until the arrival of those from Barnet and New Barnet. The water-supply was obtained from a pond immediately in front of the mansion. The plate, drawing-room and dining-room furniture, and a library were rescued from the fire, but much was destroyed. The left wing, which is of later date, though damaged by smoke and water, was saved. The outbreak is thought to have originated through a heating-flue. It is estimated that damage to the amount of about 10,000l. was done. Fortunately the place was insured. On an upper wall there was a fresco outline depicting a hunting scene of the time of James I.



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THE RUSSIAN IRON INDUSTRY.

AN elaborate report on the iron industry of European Russia has been prepared by Mr Hugh O'Beirne, Third Secretary at the British Embassy, St. Petersburg. The subject is most difficult, owing to the absence of official information. The following are Mr. O'Beirne's conclusions:—

The chief iron-producing regions of European Russia, named approximately in the order of their importance, are known as the Urals, South and South-Western Russia, South Poland, Central Russia (or Sub-Moscow), North Russia and South Finland iron districts. There is also a limited production, chiefly of magnetic iron, in the Elizabethpol district of the Southern Caucasus.

European Russia, including the Caucasus and Finland, has an area of 2,095,500 square miles, and produced in 1892 some 1,060,000 tons of pig-iron and cast-iron, 480,000 tons of wrought-iron and 516,000 tons of steel. That is to say, with an area over sixteen times that of Great Britain, over nine times that of Germany and that of Austria-Hungary, and about ten times that of France, her iron production, taking the output of pig-iron as a test, was less than one-seventh that of Great Britain, less than one-fourth that of Germany, half that of France, and only slightly more than that of Austria-Hungary.

The consumption of pig-iron per head of population in Russia was in 1891, 22·16 lbs. In Great Britain it reached in 1890, 449 lbs.; in Germany, 242 lbs.; in France, 97 lbs.; and Austria-Hungary, 61 lbs.

The principal causes to which must be referred this extreme comparative lowness of production and of consumption per head of population may be resumed as follows:—On the one hand the general demand for iron is small, by reason chiefly of the backward state of manufactures, little application of machinery to agriculture, smallness of railway traffic, &c., and it is smaller even than it must necessarily be under present conditions of industrial development, because in Russia wood replaces iron in a large variety of uses, of which house-building, bridge-making, cart and sledge-making are perhaps the most obvious in importance. On the other hand, the general cost of production is high, because the riches of iron, though great, are moderate in relation to the vast extent of the empire; they are in large part situated at immense distances from the centres of consumption; there is a deficiency of coal of the requisite quality in the vicinity of iron, and the methods of production are not always the most recent

or the most economical. Lastly, the production is checked by the limited supply of available capital.

Considered in greater detail the conditions of the demand for iron and its supply may be thus described:—

The general demand for iron in the shape of wrought-iron and steel centres in five principal regions, characterised by comparative density of population and industrial developments:—

1. Central Russia, including (1) the Moscow industrial region with the towns of Moscow, Tver, Vladimir, Kolomna, &c., having a larger production of manufactured and metallic goods than any other region of Russia; and (2) to the south and south-east of this region, the black soil region, of which the chief product is grain, but which includes the manufacturing towns of Tula, Orel, &c.

2. The Baltic region, with St. Petersburg, Riga, Libau, ranking next to the Moscow region in importance of manufactures.

3. The industrial region of Poland, with the towns of Warsaw, Lodz, Kovno, &c., the third manufacturing region of Russia and the most densely populated.

4. The region of South Russia, bordering on the Black Sea and Sea of Azov, with Odessa, Rostov, Nikolaiev, &c., in association with which may be mentioned the towns of Kieff, Poltava and Karkov lying further north.

5. The eastern metal and grain-producing region lying to the east of Nijni Novgorod, with the towns of Kazan, Perm, Samara, &c.

These centres of demand are thus supplied:—

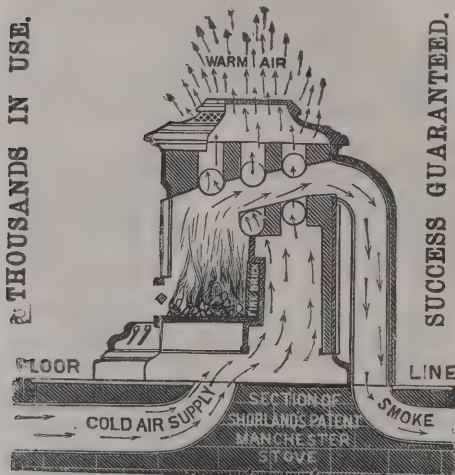
Central Russia obtains an important part of its wrought-iron and steel ready made, chiefly from the Urals, and in smaller quantities from South Russia, Poland, St. Petersburg, and abroad; makes the remaining part, principally from pig-iron obtained from inferior local ores; these, however, are supplemented by a small quantity of pig-iron and ore obtained from the Urals and South Russia.

The fuel consumed in smelting is coal sent from the Donetz, paying freightage of 12 c. per pound; and in other processes of iron making and in steel making is Donetz coal, expensive local wood fuel, and naphtha from Baku.

The Baltic region makes its wrought-iron and steel for the most part from imported pig-iron (five-sixths of which are British) and partly also from pig-iron obtained from the Urals; a considerable quantity of wrought-iron and steel is imported from abroad, and received from the Urals and Central Russia

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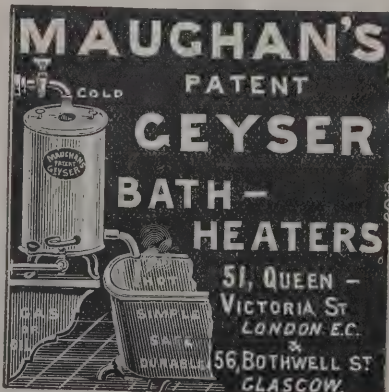
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and Poland. This district works on coal imported from England, subject to a duty of 1 c. per pound (1s. 11½d. per ton).

The Polish region makes most of its wrought-iron and steel from pig-iron which is smelted from poor and expensive local ores on coal and coke imported at a duty rate of 1 c. and 1½ c. per pound (1s. 11½d. and 2s. 11½d. per ton). These ores are supplemented by some 12,100 tons pig-iron imported from Austria and Germany. There is a considerable import of wrought-iron and steel, principally from Germany.

The South Russian is the only district which produces its wrought-iron and steel under normally favourable conditions, uniting rich iron deposits with an abundance of good local coal.

The eastern district has rich deposits of ores throughout the Urals and in the Governments of Perm and Viatka, but conducts its smelting and other processes chiefly on wood fuel.

In general, therefore, the demand for wrought-iron and steel is met by a supply produced under very unfavourable conditions. The values of the products stand correspondingly high. A rough practical measure of the relative expensiveness of iron to the general consumer in Russia and, for example, Great Britain, is supplied by the proportions borne in each country by the price of pig-iron to the average wages of labour in some of the more important industries. The wage of a cotton weaver in Russia ranges according to locality, &c., up to a maximum of 33 r. per month. Taking the wage at 30 r. and the price of pig-iron in the Moscow district at 60 c. per pound, 1 ton of pig-iron represents to the artisan about five weeks' earnings. If we take the weekly wage of a Huddersfield weaver at 17. 4s., 1 ton of English pig-iron represents to him less than one week's earnings, or a sacrifice less than one-fifth of that which the Russian consumer must make for the same weight.

In so far as the present smallness of the demand for iron results from the backward state of manufactures and similar causes, we may expect with the increase of population and the development of industries a corresponding expansion of the iron production. So far as the demand is checked by the substitution of cheap wood for expensive iron, the question of the increasing scarcity of wood has an important bearing on the future of the iron industry. Over 30 per cent. of the area of European Russia (including the Caucasus, but not Finland) is forest. But that fact gives no correct idea of the extent to which consumers throughout Russia have wood at their disposal. For while the northern districts have some 54 per cent.

of forest area, and the Central Volga and lake districts 30 per cent., the Moscow trading regions, Poland and the Baltic provinces have only from 23 to 17 per cent. of forest, and the black soil steppes practically none. Less than half of Russia is rich in forest, one-fifth is poorer than Germany or France, and one-eighth has scarcely any. There is much waste arising from mismanagement in private forests, though subject to a limited Government control.

The tariff has been directly instrumental in bringing into existence some of the more important branches of the iron industry, notably the pig-iron industry in Poland and the iron and coal industry in South Russia. It is not equally clear within what limits the industry is still dependent on a continuance of protective policy. The principal feature of the South Russian district, the rolling of steel rails, is that branch of its production which is absolutely protected against foreign competition. It is probable that if import duties on iron were removed, the Polish and Moscow districts would reduce the smelting of inferior and expensively obtained local ores, and would produce wrought-iron and steel on cheaper imported pig.

The tariff, moreover, obviously increases the expenses of production of wrought-iron and steel in the Baltic region by raising the cost of foreign pig-iron and coal, and in Poland by raising that of coal and coke; and generally throughout Russia by increasing the cost of machinery and plant, which, in the present condition of the industry must be procured from abroad.

During the years 1881-92 the output of pig-iron more than doubled, rising from 460,000 tons to 1,060,000 tons, and the combined output of wrought-iron and steel has risen from 575,000 tons to 1,000,000 tons. During the closing years of the period the production rose quickly, thus marking the decisive expansion of the home industry at the expense of imports. Thus pig-iron rose at the rate of 16,000 to 24,000 tons a year up to 1886, after which the yearly increase is 48,000 to 80,000 tons, and from 1889-90 to 177,000 tons. Steel fell after 1881, an abnormal year, owing to the issue of great Government orders for steel rails; shows no advance from 1883-89, but between 1889-92 rises from 253,000 tons to 516,000 tons. Wrought-iron is stationary from 1884-88, and rises constantly up to 1892.

A corresponding movement is noticeable in imports of pig-iron, which from 1886-91 fell from 258,000 tons to 80,000 tons, and of wrought-iron, which rose up to 1890, and from 1890-92

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fell from 93,000 tons to 49,000 tons. The import of steel rose up to 1890, and from 1890-91 fell from 16,000 tons to 12,900 tons.

While the gross production of steel rose from 1882-92 from 242,000 tons to 516,000 tons, the manufacture of steel rails shows little change (153,000 tons in 1882 to 182,000 tons in 1892). Nearly half the total weight of steel prepared in Russia is used in the manufacture of steel rails.

The countries which were the largest senders of pig-iron, wrought-iron and steel in 1892 were:—

Country.	Quantity.		
	Pig-iron.	Wrought-iron.	Steel.
	Tons.	Tons.	Tons.
Great Britain. . . .	62,130	7,500	7,200
Germany	9,700	24,800	4,700
Belgium	1,500	4,500	750
Sweden	1,000	1,630	200
Austria	300	110	310

The great bulk of imported iron of all descriptions goes to the Baltic provinces and Poland.

Great Britain provides some five-sixths of the total import of cast-iron. The larger part of the British pig-iron goes to the Baltic provinces; a small proportion to Poland, *via* the Vistula. The pig-iron most quoted is Shott's No. I and No. III for foundry purposes and hematite white and grey for steel purposes. The German pig-iron is consigned almost wholly to Poland across the western frontier. British wrought-iron and steel goes chiefly to the Baltic provinces and in lesser quantities to South Russia. The descriptions mostly imported are plates, flat, round, square, angle and T and I-iron, and common spring steel. The German and Austrian wrought-iron and steel go chiefly to the Polish district and also to Odessa, Kieff and other South Russian towns. By far the largest consignments are of iron in bars and assorted, and of iron up to 25 B.W.G.

The total import of castings in the rough was, in round numbers, 1,050 tons, consigned chiefly to the Baltic ports (320 tons), and across the German frontier (430 tons). The chief senders were Germany (540 tons) and Great Britain (310 tons).

The total import of steel rails was 2,000 tons. The largest

senders, Belgium (1,100 tons), Germany (460 tons) and Great Britain, which sent 130 tons to Batoum and half a ton to Baltic ports.

There were exported from Russia in 1892 some 200 tons of pig-iron, 5,000 tons of wrought-iron and 400 tons of steel. About 600 tons of sheet-iron went to England.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

2486. Peter Treadgold, for "An improved appliance to be affixed to doors, window sashes or casements to prevent the entrance of wind, snow, dust, or similar inconveniences."

2582. Henry Sutcliffe, for "Improvements in chimney-pots or cowls."

2600. Frederick Hughes and John Cooper Webb, for "Improved automatic door and holdfast hook."

2603. William Nicol, for "Improvements in and relating to fastenings connected with the sliding sash-frames of windows."

2694. William Ingham, for "Improved means of ventilation as applied to window sashes."

2703. Herbert Henry Green, for "Improvements in rising butt hinges and in other hinges for doors and vertically-hinged windows."

2744. Thomas Robinson, for "An improved window or sash fastener."

2791. Henry Vaughan and Samuel Smith, for "Improvements in night latches constructed to be operated by keys which are not passed through the thickness of the doors to which the latches are fixed."

2845. Michael Bohn, for "Improvements in roofing tiles."

2865. John Shanks, jun., for "Improvements in discharge apparatus of water-closet or other cisterns."

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Yours faithfully, JOHN MARSHALL DAY, Registrar and Resident Medical Officer.

84 Brook Street, Grosvenor Square, W.: December 8, 1893.

October 24, 1893: Hind Head House, Haslemere.

Fever Hospital and House of Recovery, Cork Street, Dublin: October 26, 1894.

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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

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Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

TENDERS, ETC.

*** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

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COMPETITIONS OPEN.

DURHAM.—March 25.—Competitive Schemes are Invited for the Sewage Disposal of the District. Premiums 100l. and 50l. for Two Best Schemes. Mr. F. Marshall, Town Clerk, Durham.

IPSWICH.—March 25.—Designs are Invited for the Building of a Workhouse and Infirmary, with Specifications and Estimate. Premiums 100l. and 50l. Mr. A. F. Vulliamy, Clerk to the Guardians.

LEEK.—March 4.—Designs are Invited for Proposed Covered Markets. Premiums 50l., 25l. and 10l. offered. Right reserved to carry out the Work by the Board's Architect. Mr. C. Henshaw, Clerk to the Improvement Commissioners, Leek.

CONTRACTS OPEN.

ABERDARE.—March 9.—For Building Post Office and Shop. Mr. T. Roderick, Architect, Ashbrook House, Clifton Street, Aberdeen.

ALNWICK.—March 7.—For Building Pair of Houses. Mr. George Reavell, Architect, Alnwick.

ANCRUM.—March 6.—For Works at Public Hall. Mr. J. H. Russell, Secretary.

ANERLEY.—March 2.—For Additions to School Dormitory, &c. Mr. H. J. Chaldecott, North Surrey District School, Anerley.

ARMAGH.—March 1.—For Wrought-iron Girder Road Bridge. Mr. Joseph Atkinson, junr., Court House, Armagh.

ASHFORD.—March 4.—For Erection of a Board School, with Master's Residence and Offices. Mr. H. J. Jeffery, Architect, Ashford.

ASHTON-UNDER-LYNE.—March 4.—For Building Villa Residence, &c., and Four Six-roomed Houses. Mr. Edward Garside, Architect, Town Hall Chambers, Ashton-under-Lyne.

ASHTON-UNDER-LYNE.—For Building Pair of Villas. Messrs. George & Son, Architects, Old Square, Ashton-under-Lyne.

BANGOR.—For Building Six Houses. Mr. Henry T. Fulton, Architect, 21 Donegall Street, Belfast.

BATH.—March 5.—For Execution of Work and Supply of Materials for One Year. Mr. C. R. Fortune, 4 Terrace Walk, Bath.

BATTERSEA.—March 5.—For Supply of Guernsey, Enderby or Narborough Granite Cubes. Mr. W. Marius Wilkins, Municipal Offices, Lavender Hill, S.W.

BELFAST.—March 7.—Public Mortuary. The City Surveyor.

BELPER.—March 4.—For Enlarging Board School. Mr. Maurice Hunter, Architect, Belper.

BEN RHYDDING.—For Building Two Houses (mason's work excepted). Mr. E. Critchley, Architect, 27 Kirkgate, Bradford.

BERMONDSEY.—March 2.—For the Supply of Ballast and Sand, Drain Pipes, Lime, Sewers' Ironworks, Ironmongery, Portland Cement, Disinfectants. Mr. F. Ryall, Town Hall, Spa Road, S.E.

BIRMINGHAM.—March 1.—For Works and Repairs to Buildings. Assistant Surveyor, H.M. Office of Works, Penfold Street, Birmingham.

BLACKBURN.—March 4.—For Building Eight Houses. Messrs. Simpson & Duckworth, Architects, Richmond Chambers, Blackburn.

BLACKBURN.—March 29.—For Extension of Church Higher Grade Schools. Messrs. Stones & Gradwell, Architects, 10 Richmond Terrace, Blackburn.

BLANDFORD.—March 26.—For Erection of a New Chancel and Organ Chamber for Blandford Church. Mr. Chas. Hunt, Architect, Blandford.

BOSHAM.—For Building Board School and Master's House. Mr. J. W. Loader Cooper, Queen Street, Emsworth.

BORROWDALE.—March 9.—For Additions to Board School. Mr. Thomas Hodgson, 27 Station Road, Keswick.

BRADFORD.—March 1.—For Extension of Warehouse. Mr. B. Dobson, Architect, 75 Leeds Road, Bradford.

BRETFORD.—March 8.—For Two Bathrooms and other Works at Isolation Hospital. Mr. Nowell Parr, Surveyor, Clifton House, Boston Road, Brentford.

BRIGHTON.—March 1.—For Building Technical School. Mr. Francis C. J. May, Borough Engineer, Town Hall, Brighton.

BRISTOL.—March 4.—For Quarrying Stone. Mr. T. H. Yabbicton, 51 Prince Street, Bristol.

BRISTOL—March 5.—For Improved Goods Yard Accommodation and Other Works at Harbour and Pylehill. Mr. G. K. Mills, Secretary, Paddington Station, W.

BROUGHTON—March 1.—For Erection of a Technical School. Mr. F. J. C. May, M.I.C.E., Town Hall, Brighton.

BURLEY-IN-WHARFEDALE—March 6.—For Constructing Settling-tanks, Sludge-pits, &c. Mr. A. E. Preston, 14 The Exchange, Bradford.

BURY—March 22.—For Building Fire Station, Engine House, Stables, Superintendent's House, &c. Mr. J. Cartwright, Borough Engineer.

CAMBERWELL—March 4.—For Supply of Guernsey Granite and Other Road Materials. Mr. O. S. Brown, Vestry Hall, Peckham Road.

CAMBRIDGE—March 11.—For Underdrainage of 70 Acres of Farm Lands. Mr. John Thomas Wood, Guildhall, Cambridge.

CANTERBURY—For Oak Roof to Nave and North Aisle, St. Nicholas Church. Mr. Edward W. Fry, Architect, St. Martin's House, Dover.

CARDIFF—March 5.—For Enlargement of Board Schools. Messrs. Habershon & Fawckner, Architects, Pearl Street, Cardiff.

CASTLETON—March 7.—For Supplying Road Materials. Mr. R. J. Webster, Urban District Council, Castleton, Lancs.

CHISWICK—March 6.—For Making-up Grange Road and Homefield Road. Mr. Arthur Ramsden, Vestry Hall, Turnham Green, W.

CHISWICK—March 6.—For the following Works and Stores for One Year:—Bricklayers' Works, including House Connections, Lime for Use at Sewage Works, Aluminiferie, Disinfectants. Also about 2,000 Yards of Kentish Picked Pit Flints, and about 200 Yards of Blue Guernsey Granite. Mr. Arthur Ramsden, Vestry Hall, Turnham Green, W.

CHYANDOUR—April 2.—For Building Police Station, &c. Mr. Oliver Caldwell, Architect, Victoria Square, Penzance.

CLAYTON-LE-MOORS—March 4.—For Sewerage Works. Messrs. Brierley & Holt, Civil Engineers, Blackburn.

CLAYTON—March 16.—For Extension of National Schools. Mr. S. Spencer, Architect, 344 Great Horton Road, Great Horton.

CLERKENWELL—For Enlargement of Fire-engine Station. The County Council Fire Brigade Branch, 21 Whitehall Place, S.W.

COLCHESTER—March 9.—For Supplying Road Materials, Sewer Pipes, &c. Mr. H. Goodyear, Borough Engineer, Stanwell Street, Colchester.

DAISYFIELD—March 8.—For Stores, Offices and Assembly Rooms. The Secretary, Co-operative Stores, Peter Street, Daisyfield, Lancashire.

DARTMOUTH—March 2.—For Supplying and Laying Cast-iron Water Pipes, &c. Mr. T. O. Veale, Borough Surveyor, Dartmouth.

DONAGHADEE—March 4.—For Building Houses. Mr. Lindsay, Parade, Donaghadee.

DONCASTER—March 8.—For Alterations to Front of Ladies' Stand at Racecourse and other Works. Messrs. Brundell, Simmons & Brundell, Architects, 1 Princes Street, Doncaster.

DORCHESTER—March 22.—For Rebuilding Shops and Premises. Mr. Arthur Tilley, Architect, 16 Cornhill, Dorchester.

DOWNPATRICK—March 18.—For Additions, &c., to Lunatic Asylum. The Secretary, Board of Control, Custom House, Dublin.

DUDLEY—March 9.—For Building Board Schools, Eve Hill. Mr. Robert F. Matthews, 35 Carlton Buildings, Paradise Street, Birmingham.

EAST MOLESEY—March 4.—For Supplying and Delivering Sewer Ventilating Columns. Mr. J. C. Melliss, 264 Gresham House, Old Broad Street, London, E.C.

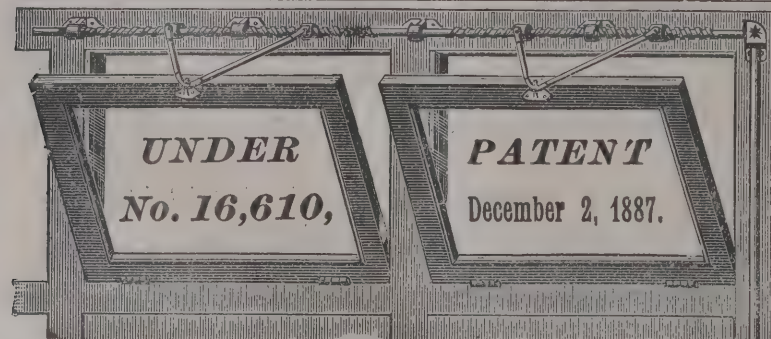
EAST RETFORD—March 5.—For Supplying Granite. Mr. J. D. Kennedy, Borough Surveyor, East Retford.

EBCHESTER—March 6.—For Additions to Derwent Hill. Mr. J. W. Rounthwaite, Architect, 13 Mosley Street, Newcastle-on-Tyne.

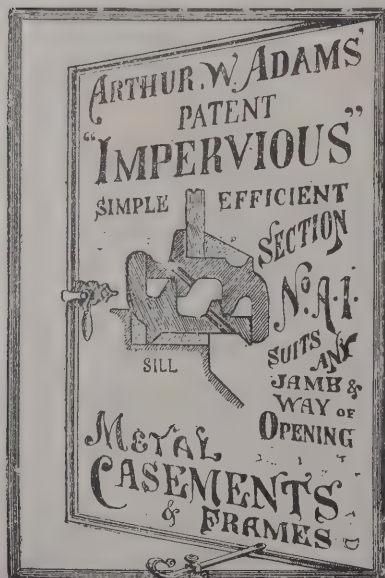
FARSLEY—March 6.—Rebuilding Church Tower. Messrs. T. H. & F. Healey, Architects, 42 Tyrrel Street, Bradford.

ECCLES—March 6.—For Supplying Road Materials, &c. Mr. A. C. Turley, Town Hall, Eccles, Lancs.

FLEETWOOD—March 19.—For Building Family Hotel. Messrs. Drummond & Sons, Architects, 13 Preston Street, Fleetwood.



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FORT WILLIAM.—March 9.—For Building Station Hotel. Mr. Dun Cameron, Architect, Fort William, N.B.

GATESHEAD.—March 6.—For Warming School. Mr. E. J. Harding, School Board Offices, West Street, Gateshead.

GRASMERE.—March 2.—For Alterations and Additions to Rectory. Mr. Robert Walker, Architect, Windermere.

GREAT HARWOOD.—March 4.—For Sewerage, &c., Works Messrs. Brierley & Holt, Civil Engineers, Blackburn.

GREAT WYRLEY.—March 1.—For Alterations and Additions to Schools. Messrs. Bailey & McConnell, Architects, Bridge Street, Walsall.

GREYNELL.—March 6.—For Building Board School Mr. J. Alfred Eggar, Architect, Farnham.

HAMMERSMITH.—March 4.—For Building River Wall. Surveyor Town Hall, Kensington, W.

HAMPTON.—March 11.—For Purchase and Removal of Twelve Houses. Secretary, Southwark and Vauxhall Water Company, Southwark Bridge Road, S.E.

HANLEY.—March 4.—For Building Mission Church and Hall. Messrs. R. Scrivener & Sons, Architects, Hanley.

HASLINGDEN.—For Rebuilding Roebuck Hotel. Mr. Charles Parsons, Architect, 9 Grimshaw Street, Burnley.

HEBDEN BRIDGE.—March 11.—For Building Four Houses. Mr. W. H. Cockcroft, Architect, West End, Hebdon Bridge.

HENDON.—March 4.—For Supplying Broken Granite, Limestone, &c. Mr. S. S. Grimley, The Burroughs, Hendon.

HICKLING.—March 13.—For Additions to Board School. Mr. John Parr, Clerk to the School Board, Hickling.

HOLBETON.—March 1.—For Building School. Rev. A. T. Allin, Holbeton Vicarage, Ivybridge, Devon.

HORNSEY.—March 11.—For the Supply of Stoneware Pipes and other Stoneware Goods, Road Materials, Paving, Granite and General Masons' Materials, Portland Cement, Grey Stone Lime, Forage, Disinfectants, General Stores and Ironmongery and for Sewerage and Drainage Work. Mr. E. J. Lovegrove, C.E., Urban District Offices, Southwood Lane, Highgate, N.

HULL.—March 14.—Shops and Houses. Mr. H. W. Ward, Recorder Office, Beverley.

ILKESTON.—March.—For Supplying Gasholder, &c. Mr. F. C. Humphreys, Gasworks, Ilkeston.

IPSWICH.—March 5.—Temporary Grand Stand. Mr. John C. Pells, Surveyor, Tower Street, Ipswich.

KENDAL.—March 8.—Alterations and Setting Back Premises, &c. Mr. Stephen Shaw, Architect, Kendal.

KENSINGTON.—March 5.—For Supplying Broken Granite, Lime, Cement, Bricks, Drain-pipes, &c. Mr. Wm. Chambers Leete, Town Hall, Kensington.

KING'S LYNN.—March 4.—For Erection of a Brick Warehouse. Mr. F. Valentine, King's Staith Square, King's Lynn.

KIRKCALDY.—March 5.—Villa. Mr. Wm. Birrell, Architect, 27 Kirk Wynd, Kirkcaldy.

LEINSTER.—March 1.—For Erection of Mess-room for M.R. Company. Mr. Jas. Williams, Derby.

LEWES.—March 4.—For Supplying Road Materials. Mr. Henry Card, County Hall, Lewes.

LEYTON.—March 4.—For Supply of Guernsey Granite, Hard-core Kentish Flint, Thames Ballast, &c. Mr. W. Dawson, A.M.I.C.E., Town Hall, Leyton.

LLWYNPIA.—March 11.—For Building Board Schools. Mr. Jacob Rees, Architect, Hillside Cottage, Pentre, Rhondda.

LONDONDERRY.—March 15.—For Building County Offices, &c. Mr. David R. Babington, Secretary to the Grand Jury, Shipquay Street, Londonderry.

MAIDSTONE.—March 5.—For Repairing Roads. Mr. Frederick W. Ruck, 86 Week Street, Maidstone.

MEVAGISSEY.—March 8.—For Building Chapel and School. Mr. F. C. Jury, Architect, Tregonissey, St. Austell.

MIDDLESEX.—March 4.—For the Supply of 3,000 Yards of Hand-broken Blue Guernsey Granite. County Surveyor, Guildhall, Westminster.

MIDDLESEX.—March 4.—For the General Repair and Maintenance of Main Road, known as Green Lanes. County Surveyor, Guildhall, Westminster.

MIDDLETON.—March 5.—For Building Wesleyan Chapel. Messrs. Howdill, Architects, 24 Albion Street, Leeds.

NAVIGATION.—March 6.—For Building Schools. Mr. A. O. Evans, Architect, Post Office Chambers, Pontypridd.

PEMBURY.—March 11.—For Providing and Erecting Engine with Two Deep-well Pumps. Mr. T. E. W. Mellor, Town Hall, Tunbridge Wells.

POLPERRO.—March 1.—For Building Pier. Secretary to the Harbour Trustees, Polperro, Cornwall.

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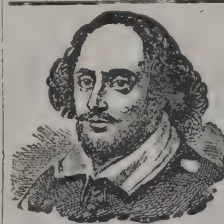
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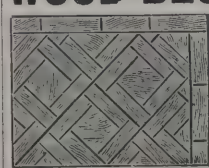
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RAMSBOTTOM.—March 4.—For Sewerage Works. Mr. Thomas Nuttall, 12 Market Street, Bury, Lancs.

ROTHERHITHE.—March 5.—For Supply of Broken and Unbroken Guernsey Granite, Broken and Unbroken Alderney Granite, Pitching Setts, Granite Kerb, Ballast and Sand, Lime and Cement, Drains, Pipes, Junctions, &c. Mr. J. J. Stokes, Vestry Offices, Lower Road, Rotherhithe.

SHEFFIELD.—March 2.—For Supplying and Erecting Four Oxide Elevators and One Lime Elevator and Conveyer. Mr. F. W. Stevenson, Sheffield United Gaslight Co., Sheffield.

SHEFFIELD.—March 6.—For Extension of Court House. Messrs. Flockton & Gibbs, Architects, 15 St. James Row, Sheffield.

SOUTHEND.—March 22.—For Erection of Sanatorium Building. Mr. W. Y. Hobbiss, Clarence Road, Southend.

STREATHAM.—March 5.—For Laying about 11,200 Yards Wood Paving. Mr. Henry Jas. Hills, Local Board Offices, East Hill, Wandsworth, S.W.

SUTTON.—March 6.—For Draining and Making-up Roads. Mr. Albert D. Greatorex, Council Offices, Sutton.

TENDRING.—March 7.—For Alterations and Additions to School. Mr. J. W. Start, Architect, Cups Chambers, Colchester.

WALWORTH.—March 5.—For Building Baths and Wash-houses. Mr. E. B. l'Anson, Architect, 7A Laurence Pountney Hill, E.C.

WARDLE.—March 6.—For Supplying Road Materials. Mr. Frank Greenwood, District Council Office, Wardle, Lancs.

WANSTEAD.—March 6.—For Building Additions to the Downsall Road School. Mr. W. Blewitt, School Board Offices, Wanstead.

WELLS.—March 4.—For Building Cottage Hospital. Mr. R. Isgar, Stuckey's Bank, Wells.

WEST HAM.—March 12.—For Supply of a 3-Ton Crane, Weighing Machine, &c. Mr. Lewis Angell, Town Hall, Stratford, E.

WOOD GREEN.—March 4.—For Repairing Roads. Mr. F. H. Pownall, Guildhall, Westminster.

WOODSTOCK.—March 2.—For Repairing Roads and Supplying Hartshill Stone. Mr. A. G. Higgs, Wootton Highway Board, Woodstock.

TENDERS.

BRIGHTON.

For Providing and Fixing a Nest of Potato-steaming Chests at the Workhouse, for the Guardians. Mr. H. S. REED, Surveyor.

Clements, Jeakes & Co, Bloomsbury	£290 0 0
J. & F. May, High Holborn	154 10 0
S. Flavel & Co, Leamington	150 0 0
Newton, Chambers & Co., Sheffield	150 0 0
T. C. Williams & Sons, Reading	145 0 0
Comyn Ching & Co., Long Acre	141 0 0
Barford & Perkins, Peterborough	140 0 0
G. Wright & Co., Queen Victoria Street (not fixed)	139 10 0
Killick & Cochran, Liverpool	138 10 0
Fraser & Fraser, Bromley-by-Bow	138 0 0
C. J. REED & SONS, Brighton (accepted)	125 0 0
Benham & Sons, Wigmore Street	125 0 0
I. Braithwaite & Son, Cannon Street	120 0 0
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Harper Twelvetees, City Road (not fixed)	104 16 3

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W. Veals	7,000	6,910	5,910
Hatherly & Carr	6,697	6,597	5,597
W. Cowlin & Son	6,673	6,643	5,773
W. Church	6,550	6,473	5,494
R. Wilkins & Sons	6,549	6,454	5,394
E. Walters	6,300	6,244	5,361
H. A. Forse	6,000	5,885	4,900
G. Humphreys	5,995	5,891	4,856
H. J. Rossiter	5,889	5,752	4,797
C. A. HAYES	5,700	5,515	4,649*

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BRYNMAWR.

For Additions to Board Schools, Caretaker's House, &c., Brynmawr. Mr. E. A. JOHNSON, M.S.A., Architect, Abergavenny.

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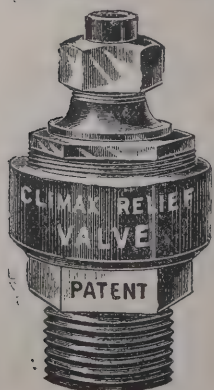
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Walden Bros., Boscombe . . . £1,247 0 0	£156 0 0
Robert Davis, Boscombe . . . 1,125 0 0	—
HEAD & SON, Boscombe (accepted) . . . 1,070 0 0	80 0 0

CARDIFF.

For Offices, Stables, Boundary Walls, &c., County Brewery, Cardiff. Messrs. J. P. JONES, RICHARDS & BUDGEON and C. C. JONES, Joint Architects, Cardiff.

D. J. Davies, Cardiff	£6,400 0 0
D. Jenkins, Swansea	6,390 0 0
Stephens, Bastow & Co., Limited, Bristol	6,300 0 0
E. F. Richards & Co., Barry	6,022 0 0
S. Shepton & Son, Cardiff	6,021 0 0
Hatherly & Carr, Bristol	5,987 0 0
H. Willcock & Co., Wolverhampton	5,985 0 0
Rees & Thomas, Cardiff	5,970 0 0
J. Allan, Cardiff	5,907 8 0
G. Griffiths, Cardiff	5,850 0 0
W. Lissaman, Cardiff	5,840 0 0
H. Davies, Cardiff	5,793 17 0
D. Davies, Cardiff	5,715 0 0
F. S. Lock, Cardiff	5,700 0 0
E. R. Evans & Bros., Cardiff	5,632 10 7
F. J. Robbins, Cardiff	5,500 0 0
H. Gibbon, Cardiff	5,500 0 0
Knox & Wells, Cardiff	5,497 0 0
J. Thomas, Cardiff	5,350 0 0
Lattey & Co, Cardiff	5,333 0 0
E. TURNER & SONS, Cardiff (accepted)	5,288 0 0
Architects' estimate	5,380 0 0

GILWERN.

For Alterations and Extensions to the School Buildings at Gilwern, for the Llanelly (Brecon) School Board. Mr. E. A. JOHNSON, M.S.A., Architect, Abergavenny.

J. G. THOMAS & SONS, Abergavenny (accepted conditionally)	£485 0 0
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DOWNTON.

For Building Board Schools, Board Room, &c., Downton. Messrs. JOHN HARDING & SON, Architects, Salisbury. Quantities by the Architects.

A. J. Matthews, Salisbury	£4,500 0 0
Kellow & Smith, Salisbury	4,045 0 0
G. Harris, Salisbury	3,985 0 0
E. Witt, Salisbury	3,950 0 0
Wort & Way, Salisbury	3,909 10 6
Ed. Hale, Salisbury	3,900 0 0
Webb & Co., Salisbury	3,768 0 0
W. Q. Cole, Amesbury	3,749 0 0
F. Beale, Andover	3,717 0 0
J. BAILEY, Downton (accepted) *	3,653 7 0
Vincent & Folland, Salisbury	3,600 10 0

* Accepted subject to certain variations.

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For Steel Lattice Girder Bridge (81 feet span), with Hobson's Patent Flooring, Viaduct, Roofs, Floors, &c., to be Constructed at the Sewage Purification Works, Heywood, for the Corporation. Mr. JAMES DIGGLE, Borough Engineer. PHOENIX FOUNDRY CO., Derby (accepted).

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For Works in Connection with New Premises, Consisting of Bakery, &c., at Oakfield. Mr. JOHN HOUSTON, Architect, St. Margaret's Street, Dunfermline.

Accepted Tenders.

J. Miller & Son, Cowdenbeath, builder	£790 0 0
A. Campbell, Kelty, joiner	692 0 0
C. Nisbet, Kelty, plasterer	189 7 9
J. Paul & Son, Cowdenbeath, slater	122 0 0
W. Binning & Son, Cowdenbeath, plumber	73 0 0
W. McLeod, Dunfermline, ironfounder	19 10 0

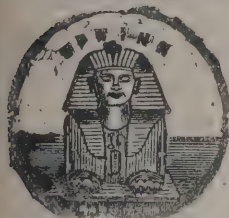
LEEK.

For Building New Branch Premises, for the Leek Co-operative Society. Mr. LARNER SUGDEN, Architect.

H. Hardy, excavator, bricklayer, stone mason, tiler and plasterer's works	£728 0 0
Isaac Heath, carpenter and joiner's works	192 0 0
Isaac Heath, plumber, glazier, painter, and gas-fitter's works	80 0 0

Total	1,000 0 0
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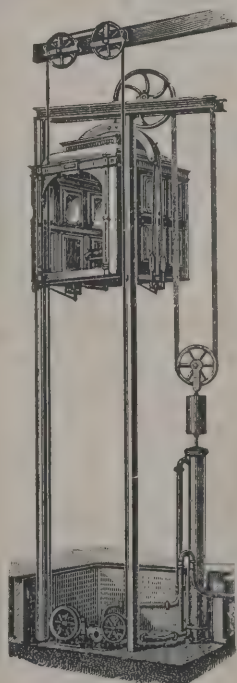
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T. H. Phillips, plumber.
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J. W. Richmond, slater.
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For Certain Alterations and Additions to the Beaufort Hill Schools, for the Llangattock School Board. Mr. W. S. WILLIAMS, Architect, Tredegar.

T. S. Foster, Abergavenny	£460	0	0
R. Edwards, Tredegar	450	0	0
J. Jenkins, Brynmawr	413	0	0
H. DAVIES & Co., London House, Beaufort (accepted)	400	0	0
D. Vaughan, Tredegar	355	0	0

LONDON.

For Enlargement of Church Street School, Stoke Newington.

Killby & Gayford	£2,241	0	0	£44	0	0
N. Lidstone	2,178	0	0	39	0	0
C. Cox	2,146	0	0	39	0	0
Willmott & Sons	2,146	0	0	50	0	0
McCormick & Sons	2,074	0	0	36	0	0
Grover & Son	1,999	0	0	43	0	0
W. W. Dabbs	1,931	0	0	43	0	0

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For Refitting the Teachers' Offices in Connection with the Goodrich Road School, East Dulwich, and Providing New System of Drainage, &c.

J. & C Bowyer	£1,793	0	0
Holloway Bros.	1,791	0	0
Lathey Bros.	1,745	0	0
Holliday & Greenwood	1,683	0	0
Whitehead & Co.	1,437	0	0
J. Frampton	1,415	0	0
Garratt & Son	1,398	0	0
B. E. Nightingale	1,395	0	0

LONDON—continued.

For Enlargement of the Munster Road School, Fulham.

Foster & Dicksee	£5,335	0	0	£55	0	0
Lathey Bros.	5,313	0	0	80	0	0
R. A. Yerbury & Sons	5,255	0	0	80	0	0
J. Shillitoe & Son	5,150	0	0	80	0	0
Hart Bros.	5,053	0	0	61	0	0
W. King & Son	4,990	0	0	90	0	0
S. & W. Pattinson	4,970	0	0	102	0	0
D. Charteris	4,909	0	0	64	7	2
Treasure & Son	4,907	0	0	73	0	0
Stimpson & Co.	4,876	0	0	96	0	0

For Erection of a School on the Page's Walk Site, Bermondsey.

Hart Bros.	£22,300	0	0	£398	0	0
W. King & Son	20,783	0	0	319	0	0
T. Boyce	20,133	0	0	375	0	0
Holliday & Greenwood	20,123	0	0	410	0	0
Lathey Bros.	19,924	0	0	319	0	0
Grover & Son	19,766	0	0	386	0	0
Holloway Bros.	19,643	0	0	318	0	0
J. Marsland	19,373	0	0	398	0	0
C. Cox	19,260	0	0	358	0	0
W. Downs	19,251	0	0	345	0	0
Treasure & Son	19,049	0	0	360	0	0
Lawrance & Sons	18,987	0	0	358	0	0
G. E. Wallis & Sons	18,686	0	0	300	0	0
J. F. Collinson	18,453	11	5	318	4	3

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R. A. Yerbury & Sons	£3,865	0	0	£135	0	0
W. H. Gaze	3,838	0	0	93	0	0
Holloway Bros.	3,734	0	0	91	0	0
Hart Bros.	3,589	0	0	76	0	0
Lathey Bros.	3,587	0	0	90	0	0
Foster & Dicksee	3,381	0	0	66	0	0
S. & W. Pattinson	3,277	0	0	106	0	0
D. Charteris	3,247	0	0	104	0	0
Stimpson & Co.	3,187	0	0	100	0	0
J. F. Collinson	3,103	4	6	80	1	10

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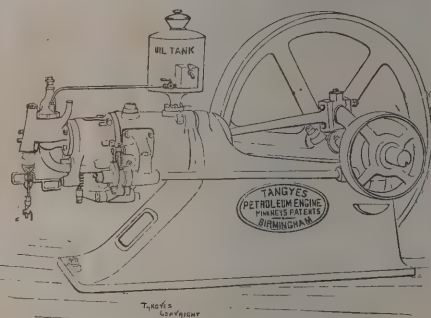
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McCormick & Sons	£4,100	0 0	£17 0 0
Staines & Son	4,011	0 0	30 0 0
W. Gregar & Son	3,988	0 0	50 0 0
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Hearle & Farrow	3,752	0 0	36 0 0
G. S. S. Williams & Son	3,687	0 0	37 0 0
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W. Neil, Burdett Road	725	0 0
Myles & Warner, Stalybridge	650	0 0
J. Yates & Co., Millwall	602	0 0
T. Warrington, Hyde	599	0 0
J. Broadhurst, Stockport	575	0 0
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O. H. Kenney, Upton Park	497	0 0
WILKINSON BROS., Finsbury Park (accepted)	474	0 0

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For Hot-water Apparatus for the Workhouse Infirmary, for the Guardians. Mr. J. G. STALLEBRASS, Architect, North Street, Peterborough.

Hayward, Refell & Co., Peterborough	£66	9 3
Nicholls, Peterborough	65	19 0
Dobbs, Peterborough	63	10 6
Gray, Peterborough	59	10 6
Beech, Peterborough	53	16 3
Aimes, Peterborough	47	10 0
Kettle, Peterborough	41	19 0
STEWART, Peterborough (accepted)	39	4 0

PETERBOROUGH—continued.

For Pulling-down and Building new House and Shop at Gowgate, Peterborough. Mr. J. G. STALLEBRASS, Architect, North Street, Peterborough.

Rawe, Peterborough	£700	0 0
Pope, Peterborough	655	0 0
Cracknel, Peterborough	623	0 0
Binder, Peterborough	610	0 0
Gray, Peterborough	570	0 0
Jellings, Peterborough	565	10 0
Bailey, Peterborough	559	0 0
Guttridge, Peterborough	526	0 0
Hicks Bros, Peterborough	509	4 0
Nichols, Peterborough	505	0 0
Bridgefoot, Peterborough	487	0 0
SIBLEY, Peterborough (accepted)	485	0 0

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For Works to be Done in Removal of Stone Floors and to Construct New Board Floors, for the Guardians. Mr. H. F. J. BARNES, Architect, Poole.

W. J. Chinchin, Bournemouth	£85	0 0
Foreman & Co., Parkstone	75	8 0
S. Knight, Celdoun	72	6 6
J. Eaton, Barter	70	7 6
Ditching, Parkstone	69	0 0
Penny & Diffey	67	19 3
Griffin, Broadstone, Wimborne	65	16 0
T. Tilsed, Celdoun	60	14 4
W. Gray, Market Street, Poole	60	1 0
Wilson, Parkstone	58	15 0
A. Saunders, Longfleet	58	14 0
Burt & Vick, Market Street, Poole	57	12 6
BAKER & PEARCY, Parkstone (accepted)	49	0 6
Architect's estimate	64	0 0

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For Levelling, Sewering, Making-up a New Road and Paths at Rowhedge. Mr. G. H. PAGE, Surveyor, Trinity Chambers, Colchester.

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G. Rogers, Clifton	£42	15	0
Lloyd & Powell, Bristol	34	14	6
F. Martin, St. George	33	13	0
P. Mirse, Bristol	31	19	6
G. Jones, St. George	28	4	9
Thomas & Webb, St. George	26	12	6
J. WILLIAMS, St. George (accepted)	23	7	3
Surveyor's estimate	24	2	0

Manchester Street.

G. Rogers	110	10	0
P. Mirse	86	9	6
Lloyd & Powell	83	17	6
Thomas & Webb	65	13	6
G. Jones	65	7	9
J. Williams	58	3	7
F. MARTIN (accepted)	53	0	0
Surveyor's estimate	63	12	0

High Street.

P. Mirse	78	13	9
G. Rogers	70	0	0
Lloyd & Powell	69	0	0
Thomas & Webb	64	7	6
G. Jones	59	10	0
J. WILLIAMS (accepted)	49	18	9
Surveyor's estimate	53	0	0

Victoria Road.

P. Mirse	129	2	6
Thomas & Webb	125	0	0
Lloyd & Powell	123	3	9
G. Jones	115	15	0
G. Rogers	115	10	0
F. Martin	111	0	0
J. WILLIAMS (accepted)	65	6	3
Surveyor's estimate	83	5	0

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For Building Cottages at Button Lane, Sheffield. Plans and Quantities by Mr. C. F. WIKE, City Engineer.

Holmes, Kirkstall Place	£1,687	13	0
J. Wheen, Porter Street	1,664	0	0
A. Duke, Ellesmere Road	1,634	12	4
Hurst, Norton Woodseats	1,627	18	
Ashforth, Burngreave Street	1,620	0	0
White, Burton Road	1,600	0	0
Walker & Slater, Derby	1,555	0	0
Ashton & Biggin, Farnival Street	1,533	0	0
W. May, Brighton Terrace Road	1,496	0	0
Bradbury, Clarence Street	1,434	12	7
J. Morton, John Street	1,420	14	9
Roper, Ashdell Road	1,379	10	0
J. ESHELBY, Spring Street (accepted)	1,368	5	0
City Engineer's estimate	1,435	0	0

WEST HAM.

For Supply of Furniture and Fittings required at the Drew Road, Manor Road, and Three Mills Schools, now in Course of Erection, for the West Ham School Board. Messrs. J. T. NEWMAN & JACQUES, Architects, 2 Fen Court, E.C.

Drew Road.

Lascelles & Co.	£1,248	0	0
W. A. Pryor	1,140	0	0
J. Heywood	920	0	0
G. E. Hawes	870	0	0
Wake & Dean	842	0	0
Bennett Furnishing Company	834	0	0
Educational Supply	834	0	0
Taylor & Co.	829	0	0
ILLINGWORTH, INGHAM & CO. (accepted)	769	0	0

Manor Road.

Lascelles & Co.	1,628	0	0
W. A. Pryor	1,600	0	0
J. Heywood	1,212	15	0
G. E. Hawes	1,100	0	0
Educational Supply	1,089	0	0
Taylor & Co.	1,089	0	0
Wake & Dean	1,088	0	0
Bennett Furnishing Company	1,069	0	0
ILLINGWORTH, INGHAM & CO. (accepted)	999	0	0

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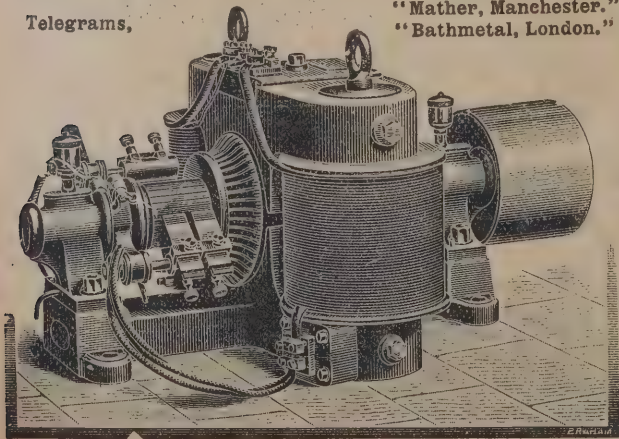
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VARIETIES.

A SPECIAL meeting of the Trustees of the Manchester Royal Infirmary has been held to consider a proposal for enlarging the present buildings. The board of management favoured a plan for increasing the accommodation to the extent of 100 beds, by adding a wing to each end of the Infirmary. This plan, Dr. Renaud stated, had met with the almost unanimous approval of the board. He accordingly moved a resolution approving the scheme as the most suitable and efficient means for meeting the necessities of the case. Mr. Alderman King seconded the resolution. Mr. Francis Greg suggested an adjournment of the meeting to give time for fuller consideration. Mr. W. Brockbank put forward an alternative plan—the rebuilding of the Infirmary on the present site, thereby providing Manchester with an hospital worthy of the city, architecturally and in all other respects. The amendment found favour with the meeting, but in order to test the opinion of the trustees generally a poll was demanded.

THE Local Government Annual for 1895, published at the Local Government Journal Office, is now to hand, and, as usual, is full of useful information relative to local government, the constitution of metropolitan and county local authorities, &c., and being compiled from data supplied from official sources, may be taken to be as reliable as a directory possibly can be.

AN inquiry under the Housing of the Working Classes Act, 1890, has been held at the Council House, Birmingham, into the scheme of the Corporation for dealing with insanitary property in Milk Street and Little Ann Street. The area of the site is 4,030 square yards, and it is estimated that it will cost the Corporation 5,500*l.* to acquire the property, while the

value of the land, when the buildings have been pulled down, is put at 3,350*l.* The Corporation do not propose to take any steps to secure the erection of workmen's dwellings in the place of those pulled down, as there is believed to be no lack of houses in the neighbourhood.

THE next monthly meeting of the London and Provincial Builders' Foremen's Association will be held to-morrow (Saturday) evening, at the Memorial Hall, Farringdon Road, E.C.

THE twenty-eighth annual general meeting of the Artisans, Labourers and General Dwellings' Company, Limited, will be held at the Westminster Palace Hotel, Victoria Street, Westminster, on Thursday, the 7th inst., at 12 o'clock, to present the report and balance-sheet for the last year, and to transact the ordinary business of the company and elect directors and auditors.

AT the meeting of the Yorkshire College Textile Society, Leeds, Mr. C. C. Dodgshun read a paper on the production of new patterns. He touched on the importance of constantly producing new patterns. The designer, by being kept working in the mill, had no opportunity of seeing the new styles. Designers ought to visit the markets themselves, and personally ascertain what was required by customers. The fact that designers had heretofore had little or no intercourse with the buying community was a state of things that ought to be remedied at once.

TRADE NOTES.

MESSRS DONALD & SIME having, on the 18th inst. resigned their respective appointments as consulting engineer and works manager of Robert Boyle & Son, Limited, with whom they have been for over eleven and twelve years respectively, have commenced business as ventilating, heating and sanitary engineers.

THE Secretary of State for Foreign Affairs has received through Her Majesty's Consul at Cadiz information to the effect that the Seville Waterworks Company, Limited, will receive up to March 8 tenders for the supply of material and construction of a foot-bridge over the river Guadalquivir. Printed specifications, estimates and conditions, may be seen at the Commercial Department of the Foreign Office, S.W., between the hours of eleven and six.

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FOR the ventilation of Martyrs' Church, Paisley, on which extensive alterations and improvements are being carried out (Mr. T. G. Abercrombie, architect), special attention is being given to the ventilation. The "Climax" patent direct-acting invisible roof ventilators are being used for the purpose of extracting the vitiated air, and have been supplied by Messrs. Cousland & Mackay, the sole manufacturers, Glasgow, and London.

THE Children's Hospital, Paddington Green, is being warmed and ventilated by means of Shorland's patent Manchester stoves, with descending smoke flues, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

THE Hope Trustees have accepted the tenders of Mr. Thomas Telford, mason, Langholme, and of Mr. Matthew Knox, joiner, for the erection of the new hospital at Langholme, of which Mr. Wood, London, is the architect.

THE Bedford Economic Fire Company are showing at their premises in New Oxford Street (No. 87) their newly-patented fire (Wilson's Patent Economic Kitchen Fire, to give it its full appellation), which deserves a visit of inspection from all architects, householders and housewives. This patent can be applied to every existing kitchen, of which it greatly increases the efficiency, at the same time reducing the consumption of fuel to a really wonderful extent. These desirable results are obtained by means as simple as they are efficacious, namely, by passing all air through the bottom of the shallow fire before it reaches the flues, from which all cold currents are rigorously excluded, thus causing perfect combustion and the almost entire consumption of smoke, at the same time rendering the small amount of fuel which the grate contains amply sufficient to heat the ovens, hot-plate and boiler to any desired degree, and with a rapidity which, by the old system, was scarcely attainable, however large the fire. The company claim to save by this apparatus from 50 to 75 per cent. in the consumption of fuel, and we are pleased to be able, by practical test, to say that this claim is in no wise exaggerated, and that the patent is a most efficient and valuable one. As we have mentioned above, it can be inexpensively and expeditiously applied to any existing kitchen. As a valuable complement to the patent fire, Wilson's patent boiler has the following advantages, *i.e.* it presents double the ordinary amount of heating surface to the fire, thus insuring greater rapidity in heating; it needs clearing less frequently and requires no setting.

ARCHITECTS IN CARDIFF.

THE annual dinner of the Cardiff, South Wales and Monmouthshire Architects' Society was held on February 21. In responding to the toast of the Society, Mr. E. M. Bruce-Vaughan, the president, asked who was responsible for the defects of Cardiff architecture? The borough engineer by suggesting the new by-law, "a separate drain to each house," had endeavoured to cope with one defect, and as a Society they heartily agreed with that by-law. Then, who were responsible for the defects? The County Council, who gave the borough engineer—a man of the highest qualifications himself—an inadequate staff, and also put him in direct competition with private industry by making him the architect of market buildings, sanatoriums, hospitals, police-stations and the like. Why should a hospital, a sanatorium, a market-place or a police-station be designed by a borough engineer and so throw a still greater burden on already overburdened shoulders, and at a time when there many local architects quite capable of designing and efficiently superintending buildings of this kind who had far too little to do? Architects at a distance seemed to think that Cardiff was a veritable Land of Goshen, but how disappointed they were when they had learned by experience that so little was left for private and individual industry because of the estate system and because the municipal governors were the municipal architects as well. Continuing, the President accounted for the absence of the science of architecture in their buildings at Cardiff by pointing out that the houses and villas were built by the score for the people instead of the individual building the house for himself. They were built for the sake of the profit to the speculator. There was no other object in view, and he did not know of any town of the size where the villa and residential architecture was so poor as it was in Cardiff.

Mr. W. Harpur said that there had been 1,000 houses per annum built in Cardiff for the last ten or eleven years, and he mentioned that since he had been appointed borough engineer he had performed more work than the whole of his predecessors.

Mr. W. H. D. Caple proposed "The Kindred Arts and Sciences," to which Mr. E. W. Waite responded, and other toasts followed.

The public matters with which the architect's profession is concerned in South Wales have been recently exciting some

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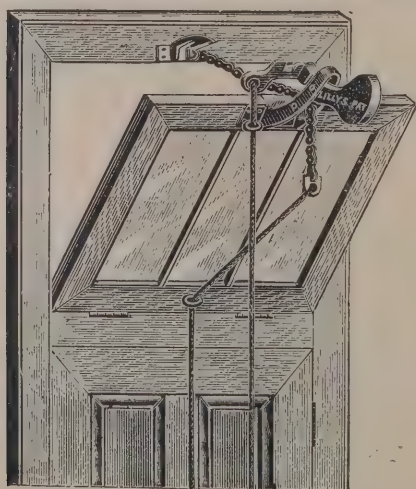
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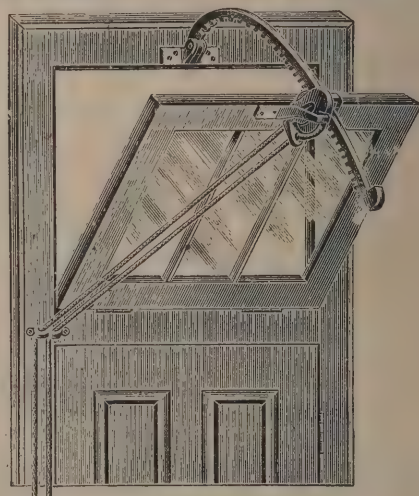
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amount of interest and comment in circles even outside the profession itself. It was expected in some quarters that reference would be made at the dinner of the Architects' Society, held in Cardiff on Thursday night, to the burning question of the new museum and art gallery, but in this the public was disappointed. Our own comments upon this matter a week or two ago indicated that the subject is one not of limited importance, inasmuch as the question seems to involve the honour of the Corporation as well as the individual rights of an individual. The absence of Mr. Edwin Seward, the immediate past president of the Society, from Thursday's dinner was a conspicuous absence; and inasmuch as his name did not appear amongst those who had sent letters intimating their inability to be present, the matters in dispute between that gentleman and the majority of the Society assumed a critical phase. In order to obtain an explanation of the whole position, a representative of this journal waited last night upon Mr. Bruce-Vaughan, the president of the Architects' Society, by whom he was very courteously received.

"The question involved," said Mr. Vaughan, "is simply whether Mr. Seward has been retained by the Corporation as architect for the new museum and art gallery in Park Place. Mr. Seward says he has; members of the museum building committee, including Dr. Chas. Vachell, say he has not. It is, indeed, affirmed that the committee has not yet even met, and therefore could not have appointed an architect. Then, Mr. E. W. M. Corbett, architect to the Bute estate, states distinctly that the ground in Park Place was let or leased to the Corporation on the understanding, or with the provision, that the designs should be thrown open to public competition."

"But to go further back, Mr. Vaughan. Is it not the fact that Mr. Seward was appointed, under resolution of the Council, architect of the library extension, which included at that time the museum and art gallery?"

"Yes, that is so."

"Then, in your opinion, a change of site necessarily involves a change of architect?"

"No, personally I do not think it should necessarily involve a different architect; but remember what members of the committee—who are the employers in this case—emphatically say, that no architect has been appointed."

"In the absence of a resolution of the Corporation rescinding the previous resolution, would you not consider that it was intended the same architect should be employed for the new site?"

"Well, yes, I should be inclined to think so. At the same time, the circumstances of each case must be weighed. Supposing I, as a builder or owner, modified my original plans, and paid my architect his full fees for the work executed and part fees for the portion not carried out, I should feel myself at liberty to employ any architect I chose if I determined to complete the first plan."

"Would you, if you had again had the assistance of the same architect to carry out your second thoughts?"

"Oh no."

"Then is it not true that Mr. Seward has done work in connection with the new site of the museum?"

"I believe he has reported upon the capacity and suitability of the new site, but only in an honorary position—as a member of the museum committee."

"Is it customary for architects to do work honorarily for a public body like the Corporation?"

Mr. Vaughan (smiling): "I can't say. Some people do it."

"Do you think Mr. Seward would have at least a moral claim if he had done any work whatever for the new site, especially in view of his position as architect under the original scheme?"

"Yes, I think he would have a moral claim, and if Mr. Seward can establish that claim I, for one, and I am sure the majority of the Society members also, would back him up in it. But Mr. Seward has persistently declined to attend our meetings to discuss the subject, while we have the statements of Dr. Vachell and Mr. Corbett against the position he takes up."

"Did Mr. Seward write you a letter explaining why he would not be present at the dinner last night?"

"Yes. I also received other letters of apology for non-attendance from other gentlemen, but I did not mention the fact at the dinner. Only those gentlemen who had written to Mr. Caple were thus named. In any case it was not desirable to make known the contents of the letter, because they are of a controversial nature, and not calculated to promote that harmony which should reign at the festive board."

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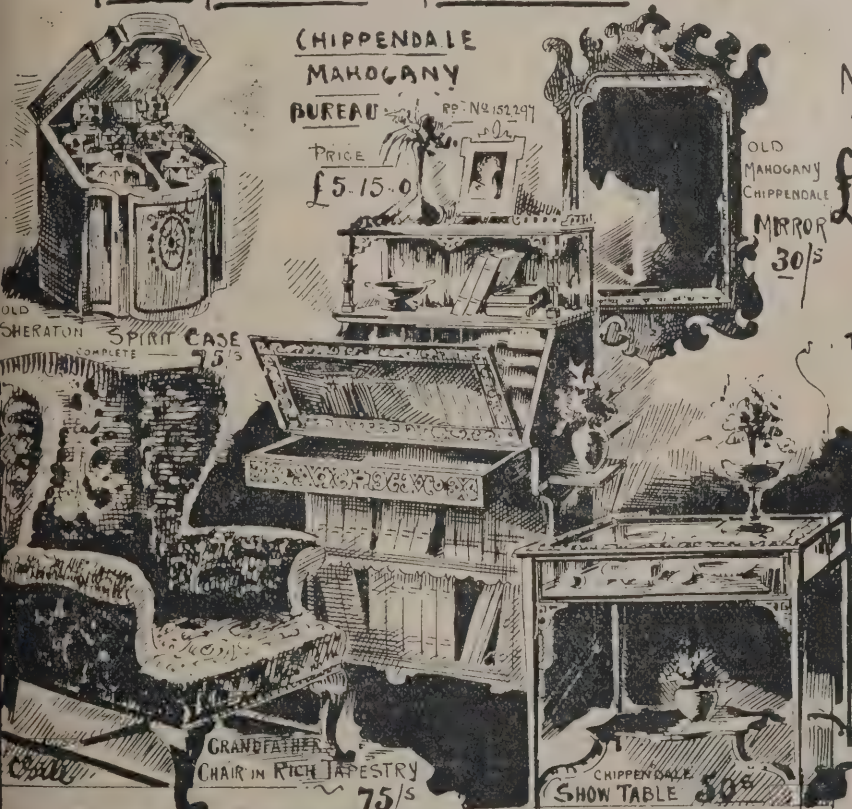
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"Do you feel at liberty to show me the letter?"

"No. I think it ought to come first before the Society. I may tell you, however, that I have replied to-day to Mr. Seward, saying that I will call a meeting of the Society any time which may suit his convenience to discuss the matter, provided he will promise to be present."

"Finally, do you object to state how much the museum retainer will be worth to the architect?"

"No; I should say somewhere about 600/."

In view of the refusal of Mr. Bruce-Vaughan to divulge the contents of Mr. Seward's letter to him on the subject in dispute, our representative pursued further inquiries, which resulted in his obtaining a copy of that interesting document. It is as follows:—

My dear Vaughan,—I am writing to express regret at being unable to be present at the annual dinner of the Cardiff, South Wales and Monmouthshire Architects' Society. The course which has been followed in endeavouring to so influence the authorities as to cause me to be deprived of the position of architect to the Cardiff Museum and Art Gallery, as an institution with which my professional connection is well known, and also in interfering between some of my most valued clients and the position I hold with them was quite unjustified. This course, together with the kind of methods adopted, constitute an unworthy departure from those right lines of professional courtesy and fairness which we claimed to uphold when forming our Society, but which Society has thus been used by the many as an organised instrument for harassing and injuring the professional practice of the one. The call for public competition, often fair and proper enough, has in this instance been raised with the knowledge that, after my many years of work and waiting for the development of this institution, for which I have done so much, both professionally and honorarily, such a call, if responded to, would be cruelly inequitable to me. In spite of my representations to the Society, made formally and at the right season, my words have been disregarded. The action against my interests has been persisted in, even though possibly tending in the long run (as I at first showed) to create antagonism between the clients aforesaid (viz. the Cardiff Corporation) and myself; and this, moreover, at a time of considerable importance in the history, architecturally, of that Corporation. That course, further, has laid disadvantages upon me to which I have referred when writing to the secretary of the Society. Nevertheless, although plenty of opportunity has existed for amending the position of

affairs during the weeks it has now existed, nothing of that kind has been done. Such action towards one who had been first president of the Society until a few days previous is too unmistakable in its intention to allow me to risk any mere affectation of good fellowship, and, much to my personal regret, I recognise the position created by the Society as prohibiting my joining in its meetings at present.—Yours very faithfully,

EDWIN SEWARD.

Mr. D. Jenkins, of Llandilo, writes to the editor of the *Western Mail*:—As one member of the Cardiff and South Wales Architects' Society, I regret the position the Society is now brought into by some Cardiff members who appear to act for all others in South Wales. If they cannot retreat from their contemptible attitude and disregard of professional etiquette after the emphatic protest Mr. Seward has made in his letter to the president, I cannot feel it any credit to remain one of them and shall soon act accordingly. As I do not live at Cardiff I can, without prejudice, look on both sides of this case. There is no doubt, to my mind, of the art gallery and the museum being in Mr. Seward's hands in a way which is honourable to him from the original competition, and from drawing up reports and plans for extending and utilising the new site. But these Cardiff members seem wishful to take advantage of the site being changed, and though knowing or having been told about the old plans, &c., try to tempt the committee by the cry for competition, in order to overthrow Mr. Seward for their own ends. It is nothing less than intrusion on individual rights for them to interfere and try to snatch a chance for themselves, to the injury of another man. Now, there can be no pretence or ignorance after Mr. Seward's clear and emphatic protest in writing to say that he has claims to the work. This ought to be sufficient from one of themselves, who had also just vacated the presidential chair, and would be so with every other society or institution, as we all earn our daily bread from work as to which we should not think of asking for pledges. As for architects raising such a question about one whom they well know has been engaged in the ordinary way, I do not remember such extraordinary petitioning and using of the names of members without their authority. I am sure the Royal Institute would condemn it. If I am wrong, let Mr. Vaughan, as president, submit or refer it to that Council for decision and satisfaction to all concerned.

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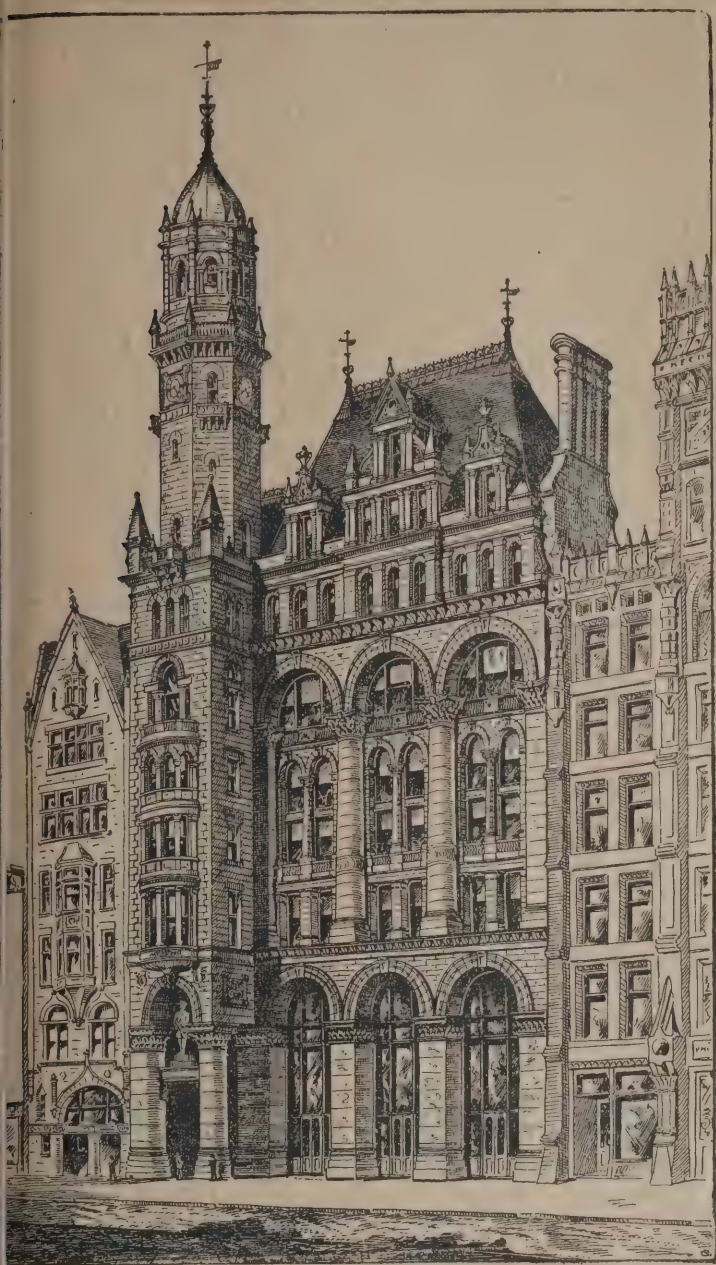
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THE PENN MUTUAL, PHILADELPHIA.

THE above woodcut represents the Penn Mutual Building, situated on the north side of Chestnut Street, between Ninth and Tenth Streets, Philadelphia. It was erected by the Penn Mutual Life Insurance Company, from the designs of Mr. Theophilus P. Chandler, jun., architect. The style is difficult to express by a single phrase, as must be the case with all progressive structures. It has a frontage of $77\frac{1}{2}$ feet, with a height of seven storeys, crowned by a double dormer attic and steep roof, making a total elevation from the sidewalk of 136 feet as regards the main part. But there is a wing, and that is carried up to the same height as the principal structure for seven storeys, but at that point a clock tower is superimposed upon it. The tower starts from the roof of the top-most storey, and not from the ground. The Post Office is set well back, and is thus given an amplitude of sidewalk; the next building west of Ninth Street has a little less sidewalk, but still some space is surrendered. Then comes the Penn Mutual, whose main body is on the line of that building, but the wing projects 12 feet and gains the level of the other buildings that commence at Tenth Street. These conditions would have permitted the erection of an actual tower, but that was not wanted. Hence the architect boldly made the tower an obvious supplementary construction, starting it from the roof of the wing and carrying it to a total elevation from the ground of 190 feet. The material used for the façade was Baltimore white marble, dressed but not polished, with a small amount of rock-faced ashlar used simply as a foil. The façade of the main entrance is arranged in three masses. Between the pillar and pier of the main entrance to the wing is a lintel supported by excellently carved corbels, and over this is a double pedestal forming the support for a marble statue of William Penn. The building is of fireproof construction.

WHITLEY-BY-THE-SEA, NORTHUMBERLAND.

THE popular seaside resort, Whitley-on-Sea, is being further developed. Plans have been passed by the local authorities for the whole of the sites commanding the main turnpike road from Whitley old village almost to the sea. The main road will be considerably widened, the houses will be self-contained, averaging about 19 feet frontage by 80 feet in depth, and will be known, when finished, as the Park Avenue. Some of the houses are almost finished, the remainder are in course of erection. They are pleasantly situated, commanding extensive country and sea views. They have neat elevations, and appear to have all the latest improvements, sanitary appliances and conveniences, and are sure to be an attraction to visitors and residents alike. It may be mentioned that the whole of the land has been recently purchased by the enterprising contractor, Mr. James Hilton, of Whitley, who has built largely in the neighbourhood, and with considerable success.

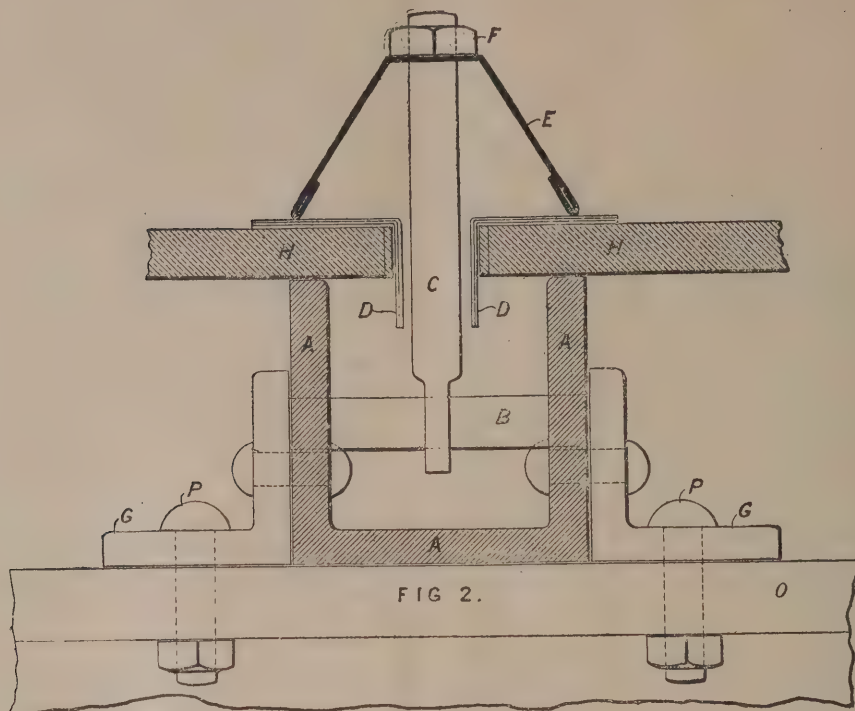
The plans have been prepared by Mr. A. Ross Hunter, architect, 131 and 133 Pilgrim Street, Newcastle-upon-Tyne. It would appear, however, that Whitley is not the only pleasure resort that is rapidly growing in the North, as Mr. A. Ross Hunter is just finishing four large stone houses at Warkworth with all the latest appliances and conveniences. Each house has an extensive garden at the front and rear; the fronts overlook the beautiful river Coquet and surrounding country, and the rear commands an uninterrupted view of the massive ancient and historical Warkworth Castle, belonging to the Duke of Northumberland, and which is free to visitors and is well worth a visit from any lover of antiquities. Morpeth, Alnmouth and Alnwick are in close proximity, and each have renowned histories. Mr. Hunter is also having finished some houses at Broomhaugh, Riding Mill (on the upper reaches of the river Tyne), one of the most charming spots in Northumberland, near to George Stephenson's birthplace, close to the Roman Wall and the ancient historical town of Hexham.

NOTES ON NOVELTIES.

Paradigm Skylights.—The excellent system known as the "Paradigm" skylight system has been recently invented by Mr. A. Edgumbe Rendle, a son of the late Mr. W. Edgumbe Rendle, of London, who was well known as a glass-roofing contractor and horticultural builder. For some years past Mr. Rendle has resided in America, being the owner of the "Rendle" skylight patents for that country, and soon after inventing the "Paradigm" skylight system, a company was formed in New York for the purpose of introducing the new system, and several important contracts have been secured, as follows:—New stations of the Brooklyn Bridge, New York and Brooklyn—45,000 feet super; Jacksonville Terminal Co.'s new station, Jacksonville, Florida—20,000 feet super; new station at Syracuse, New York, for the New York Central and Hudson River Railway—10,000 feet super; United States Government, Washington, Library of Congress Building; Chicago Edison Co., Chicago, skylights over power-house—15,000 feet super; Central Railway of New Jersey; Equitable Gas Light Co. of New York; Pencoyd Iron Works, Philadelphia, &c. The engineers of the New York and Brooklyn Bridge, Brooklyn, can speak as to the class of work done for them by the American Company; also the Chicago Edison Co., Chicago; Pencoyd Iron Works, Philadelphia, Pa.; Phoenix Iron Co., New York; Mr. Bernard R. Green, engineer, Library of Congress, Washington. Among the special advantages of the system are the following:—The main bar being made of rolled steel, greater strength is necessarily obtained than in sheet metal bars now being used all over the country. The steel channel bars are not exposed to the weather at all, being entirely and completely covered by the glass and "caps," and they can be kept painted and will last as long as the building. The "caps" are the only part of the patent "Paradigm" skylight system exposed to the weather, and as these can be made of strong copper, it will be readily conceded that a skylight or glass roof constructed on this system should outlast an ordinary skylight many years. It is the most economical skylight system by reason of the fact that we can supply it at a price that will almost compete with the ordinary sheet metal skylights. The cost of maintenance and repairs is reduced to a minimum. As the steel channel bar is so strong, averaging from $\frac{1}{8}$ to $\frac{1}{4}$ inch thick, a less number of roof purlins are required; for instance, purlins need not be less than 5 to 8 feet centres. Broken panes of glass can be replaced more easily and quickly than by any other method. The skylight bars are usually rolled in one length, up to 40 feet if necessary, so that defects through careless soldering and consequent leakage, as in the sheet metal bars, is an impossibility. The glass is all on a level and butted at joints; no ugly laps. The method of carrying off the condensation formed on the

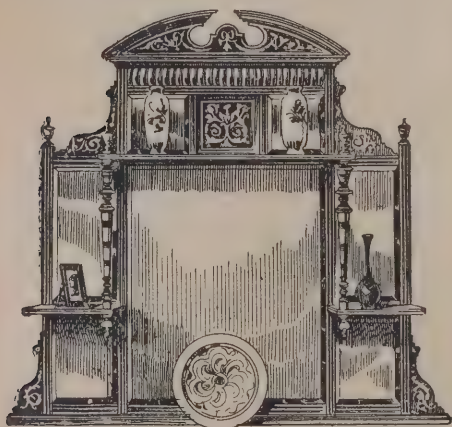
under side of the glass is simply perfect. A skylight or glass roof glazed on the patent "Paradigm" system cannot get out of order. If no glass is accidentally broken there is no reason why the skylight should not last for a hundred years. For the roofs of greenhouses the "Paradigm" system of glass roofing

itself to engineers and architects. The cross bar is usually made of strong copper or other sheet metal. The glass rests on the edges of the channel bar, and should the iron contract or expand the glass is out of harm's way, so that if the metal contracted or expanded one-quarter of an inch (which, of



cannot be excelled. All the wooden sash-bars are done away with. The method used for making a watertight joint at the junction where two panes of glass meet, which permits the glass to be butted instead of being lapped, will commend

course, is unlikely), still the glass would be uninjured. The great trouble has been when glazing glass on iron (T bars being generally used), the breakage from the above cause has been enormous.



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AT the meeting of the Association, Mr. E. W. Mountford, president, in the chair, the thanks of the members were passed to Sir A. Blomfield for affording them to visit the new Church House at Westminster.

Mr. H. H. STATHAM read a paper, of which we give the following abstract, on

The Bridges of London, Architecturally Considered.

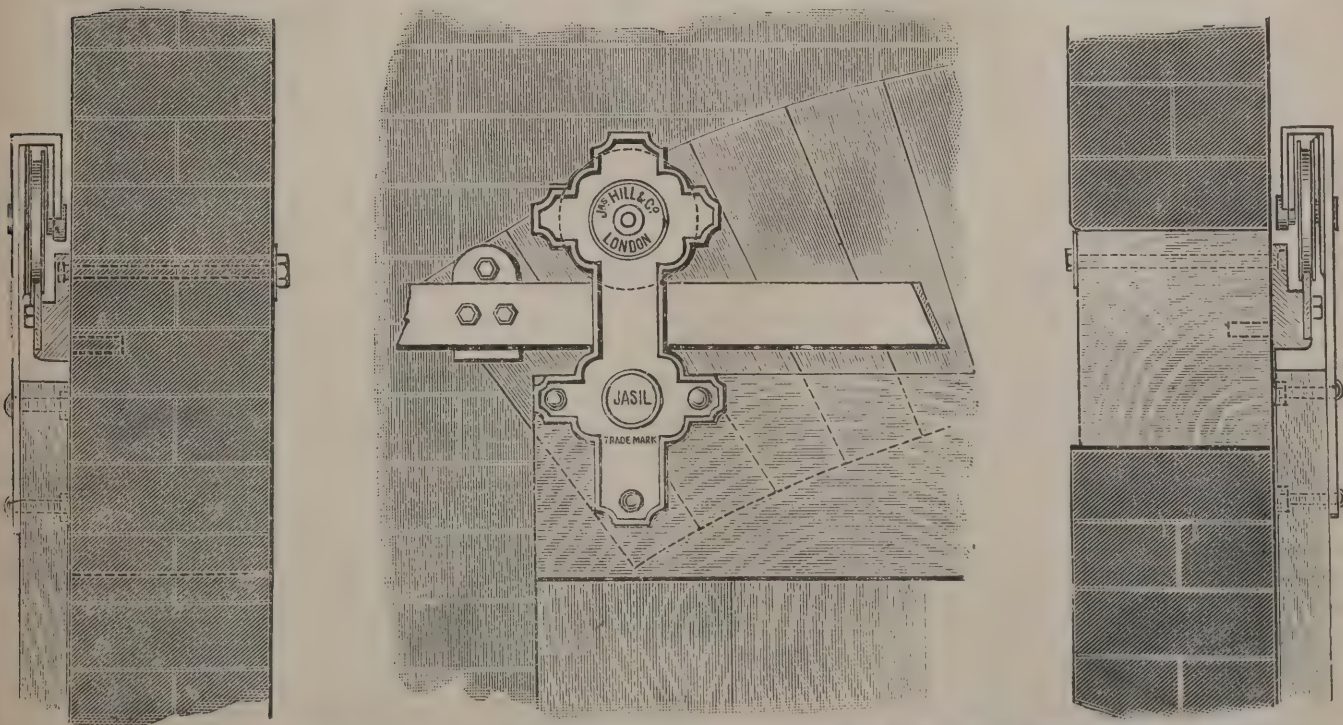
In taking for my title "The Bridges of London, Architecturally Considered," I am aware that in the two last words I may seem to be begging a rather large question in assuming that there is an architectural quality in a bridge which can be considered apart from its utilitarian side. Some of us probably think, and I should be inclined to agree with them, that it is a great pity the professions of engineer and architect were ever separated at all; that every architect should be an engineer and every engineer an architect; and that the result of the separation has been that we have one set of men who devote themselves entirely to constructional problems, and ignore—are almost trained to ignore—the artistic and expressive aspect of construction, and another set who devote themselves mainly to the artistic side of construction and sometimes know much less of its scientific side than they ought to know. In regard to bridge building, however, there is a rather distinct line of demarcation in the work, and that is the line of the water-level. It must not be forgotten in considering the subject, that in building a bridge over water of any depth, and more especially water which is actuated either by strong currents or strong tides, the most difficult and in a sense the most

important part of the whole work is that which is under water, and it is impossible that this could be successfully dealt with by anyone who has not had special experience and special training in that kind of constructive problem. When we come above the water-line the problem becomes one of ordinary construction, which is, or ought to be as much within the province of the architect as the engineer, unless in such exceptional cases as that of the great lifting leaves at the Tower Bridge, which again form an exceptional problem demanding a kind of mechanical knowledge which is not properly within the domain of the architect.

We as architects may therefore rightly leave to the engineer the problem of bridge foundations under water, admitting our inability to deal with it adequately; we only claim to have something to say in the matter when the work gets above water. And this, not only because the constructional work there is not (or, shall we more prudently say, ought not to be?) beyond our capacity to deal with, but because the question of the design and expressive treatment of the superstructure, which comes into our special province, is of far more importance than it has been generally allowed to be. The fact is, there is hardly any kind of structure which may have greater influence, for good or bad on the architectural effect of a city than its bridges, in those cases where a large river flows through it. The bridges in such a case are among the most prominent objects in making or marring the general effect and impressions of the place. They are seen both from the banks and from the river; they are seen on both sides, unlike many town structures; they are seen from above and from below, from close at hand or from a distance. In the most crowded city there is a clear vista along the river and its banks. You see the bridges in succession, a perspective of beauty or a perspective of ugliness. And what class of structure can be more capable of beauty than a bridge? Its series of arches contrasting with the long lines of its cornice and balustrade, and with the masses of the piers; the cut-water bases of the piers, which every bridge built in running water must have, and which give such a special character of the picturesque founded on the practical; and, above all, its situation above the surface of water, with all its magical effect of movement, of glittering lights (even Thames water looks beautiful in the sunlight), or of calm reflections; can there be any greater possibility for the production of architectural charm than in such an erection, in such a situation? The very simplest stone arched bridge is an object of beauty if you trust only to its natural disposition of

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lines and masses, and it takes a good deal of bad detail to thoroughly spoil it, unless the detail is very large and prominent indeed. Unhappily there seems to be now an increasing desire to build what are called "handsome" bridges, in which there is a great deal of detail, often very large and generally very bad; and I hope to show that some of the older bridges of London, now removed, which were much simpler in design than their successors, were also far superior in architectural quality.

Let us first, however, briefly consider the architectural treatment of bridges in a more general sense. In regard to architectural expression there are four principal points to be considered:—1. The shape and proportion of the arches; 2, the treatment of the soffit of the arch; 3, the treatment and design of the piers; and (4) that of the finish of the bridge along the top, *i.e.* the cornice (if any) and the balustrade or fence wall. This latter is entirely independent of the construction of the bridge, but its design may have an important effect on the general appearance of the structure.

For anything worth calling a monumental bridge in an architectural sense there is but one material, stone, which can be regarded with entire satisfaction from our point of view. There are cases, chiefly those of railway bridges, in which stone cannot be used, at all events for the portions between the piers; for ordinary traffic there is hardly any case, except that of a drawbridge, in which stone arches cannot be used as well and as satisfactorily as iron cantilevers or girders, as some of the existing examples among London bridges completely prove and with infinitely better effect. As soon as you introduce iron, however well-designed and however massive your stone piers may be, you at once destroy the monumental effect of the structure as well as its unity of expression; you force into architectural union two materials which are radically distinct in character and in properties; you introduce an element of decay, for however long iron may last, the most enthusiastic believers in that material can hardly pretend to believe that it will last as long as a built structure of granite or even of a good building stone; still worse, you introduce as a necessity the element of paint, a disagreeable artificially-made surface, which can never harmonise with nature as pure stonework will. For the finest effect attainable from a bridge it must be entirely of stone, balustrade and all; even an "ornamental" iron balustrade interferes with and spoils the breadth and unity of the composition.

The number and relative proportion of the arches is a

matter which is to some extent governed by practical considerations. Almost invariably it will be found that the older bridges have a larger number of arches of smaller span than the modern ones; in all the cases of London bridges which have been rebuilt, with the single exception of the Hammersmith Suspension, the modern ones have fewer and larger openings than those which they replace. It can hardly be questioned that the older type of stone bridge, with numerous and comparatively narrow arches, was in general a more picturesque object than the modern bridge with its wide spans and comparatively flat curves. Landscape painters who introduce a bridge as an incident in the scene will be found, I think, always to prefer a bridge of many arches to one of the modern type. But in the case of a river running through or past a great city, and which forms the water highway for its traffic, the reduction in the number of piers becomes a continually increasing necessity, which in the case of our last new bridge, placed at the point where the river traffic is thickest, has resulted in the employment of an entirely new mechanical arrangement for avoiding interference with the passage of shipping. Wherever water traffic has increased, however, there is always this continual fight going on between the architectural claims of the bridge and the practical claims of the water traffic. Some of the Thames bridges above the London district, such as Wallingford, Sonning and Chertsey, are very picturesque, and Kew is as charming a specimen of bridge architecture as could be seen; and as far as the two former are concerned there seems no reason why they should not remain as they are, since the traffic is not extensive except in the way of pleasure rowing-boats. But Chertsey Bridge, where there is more going on, and where the arches are unusually narrow, has been found to be a practical inconvenience, and being, as American visitors say of our cathedrals, "somewhat out of repair," it will probably be removed before long and will, undoubtedly, be replaced by one with wider spans—let us hope not an iron one. Kew I call a beautiful bridge, of finer design and much better built than Chertsey, and with fairly wide arches, and if it were an upper Thames bridge it might be adequate to its position for a long time to come. But it crosses the tidal portion of the river, where at spring tides the rush of water is tremendous, and it is at such times both an obstruction to the flow of water and a danger to the navigation. The fact of this necessity for the removal of some of our most picturesque existing bridges is an additional reason for calling attention to the subject of the architectural aspect of bridges.

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The form of arch to be adopted must be to some extent ruled by the proportionate width of opening in regard to the height of the roadway above the water-line. In the old-fashioned bridges, with narrow openings, the semicircular or the pointed arch could be used, and there was little to choose between them except as a matter of consistency of style. Mediæval bridge-builders, however, were rather given to use a segmental pointed arch, with heavy longitudinal ribs or groins abutting against the piers, as in Old London Bridge and in the interesting old bridge at Huntingdon still remaining; but though this has a fine, solid and picturesque effect, it is bad practically, as it lowers the headway unnecessarily near the piers. For rather wider proportioned spans the Tudor four-centred arch would be a serviceable form if a pointed arch were desired as a matter of style, as it gives a flatter proportion, while at the same time rising quickly from the pier. When, however, we come to spans of 120 feet to 150 feet, as in Waterloo and London Bridges, none of these forms are applicable, and we have only the choice between an ellipse or a segment of a large circle, of which the first is illustrated in London Bridge, the second in Waterloo and New Putney Bridge. Of the two I think, on the whole, the ellipse is preferable. It is a complete curve instead of an incomplete one; it rises tangentially from the vertical face of the pier, which is more pleasing to the eye than the abrupt angle made by the segmental arch; and where the springing is not much above the water-line it has a practical advantage in giving more vertical space near the piers. For an arch of the same width and height, it of course means a rather flatter curve in the upper portion of the arch than would result from the use of the segmental arch, but the practical difference in this respect is not after all very great. The segmental arch is no doubt simpler to construct, and where a pretty good height can be obtained in proportion to the width, as in Waterloo Bridge (which is 37 feet rise to 120 feet span), there is something grand in the simple sweep of the segmental arch; but where the proportionate rise is less, as in Putney Bridge (which is 144 feet span to 18 feet 6 inches rise), the arches have an appearance of being jammed between the piers instead of "springing" from them, which is not agreeable to the eye.

The question of symmetrical spacing of the arches is one which has been often debated. Where there are any peculiar circumstances which afford a suggestion for a different treatment of different sections of a bridge, I think these should be taken into account and frankly expressed in the design. There is an interesting example of this in the old stone bridge over

the Dee at Chester, where the river is broken by shallows or rocks into several channels, and the bridge arches have been built of varying widths, just as the foundations of the piers could most economically be made; the effect is picturesque and characteristic. This is an exceptional case, however, and there can, I think, be no sort of excuse for irregular spacing of the arches of a bridge unless there is this kind of obvious reason for it in the nature of the site. But take the case, which may not infrequently happen, of a bridge over a river of which one side of the visible water area is shallow and unfit for navigation, and the navigation is necessarily confined to the deeper half of the stream; there would then be a legitimate leading to a picturesque treatment, building the bridge in a succession of narrow arches over the shallow portion (where the foundations of the piers would, if the ground were good, be a comparatively easy matter), and throwing one or two wide arches over the navigable portion. Thus there would be a highly picturesque effect of contrast produced, which would actually be a visible index to or proclamation of the physical conditions of the water-way. There are portions of the Thames where this reasoning in bridge-building would fully apply, but not within the London district. There we have no excuse, as far as the water-way is concerned, to depart from symmetry in design; and to my mind bridges which form portions of the architectural scenery of a great city should be treated symmetrically, when there is not any obvious practical reason to the contrary. But there is still the question whether we should preserve the same span in all the arches, or treat them with a symmetrical variation. Of our three finest bridges—London, Waterloo and Putney—the first and last are designed on the principle of keeping the central arch widest and diminishing the others in an equal ratio each way. In London Bridge the centre arch is 152.6 feet span, the two next 140 feet, the end arches 130 feet. In Putney Bridge the centre span is 144 feet, the two adjacent arches 129 feet, and the two end arches 112 feet. Waterloo Bridge, on the contrary, marches straight across the river with its regular stride of 120 feet to an arch. Which method should be employed depends partly on whether you are anxious to keep your bridge roadway perfectly level from end to end, in which case, of course, the unvaried width of arch renders it easier to do this, but in every other respect the merit seems entirely on the side of the symmetrical variation principle, with the widest arch in the centre. A slight rise towards the centre of a bridge does not seriously



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inconvenience the roadway traffic—indeed, there is a story of a country carrier who, on first crossing a modern-built bridge with a level roadway, grumbled that “he did not call that a bridge, for you could not tell when you came on it and when you were off it.” The slight curve of the balustrade and cornice line is more pleasing from a distance than a rigidly straight line; the variation in width of arch gives an increased interest to the design without destroying bi-lateral symmetry; while the greater width of the central arch is an actual convenience to the water-way traffic, especially on a river where a great deal of the barge traffic depends mainly on the tide for locomotion, and naturally keeps in the centre of the river where the tide runs strongest. The wide central arch is, in fact, only carrying out permanently and architecturally what had before been done temporarily, for the first step towards rendering some of the old London bridges more suitable for the increased water-way traffic consisted in knocking one or two piers out of the middle and making a wider arch there. That was done both with Old London Bridge and Old Putney Bridge, long before they were finally removed.

But the design of Waterloo Bridge suggests another point. I said just now that there was nothing in the condition of the water-way of the Thames at London to justify or suggest an unsymmetrical treatment of the bridges. But there is something to suggest this in the levels of its banks. The main line of traffic with which Waterloo Bridge is connected at its north end is at a much higher level than that at its south end. Perhaps few of those who, after alighting at Waterloo Station, are dragged by a straining cab-horse up the gradient leading to Waterloo Bridge, realise that this uphill tug is all in order that Waterloo Bridge might realise its uncompromising severity of design by being carried at a uniform level right across the river, from the high bank to the low one. In the case of London Bridge there is the same kind of discrepancy between the design of the bridge and the bank levels, but to a less degree, as the ground on the north side falls rather towards the bridge, and the difficulty has been partially evaded on the south side by “fudging” to some extent the lines both of the parapet and the roadway, so that about 3 feet of the necessary fall is obtained on the bridge itself, without the effect on the symmetrical character of the design being very noticeable unless looked for. Attention was drawn to this point in an interesting paper on the bridges of London, considered mainly from an engineering point of view, read four-and-twenty years ago before the Institute of Architects by

an engineer, Mr. Henry Carr. Speaking with special reference to Waterloo Bridge, he propounded the question whether the right treatment would not have been to have kept the highest point of the bridge as near as possible to its north end, and built it in a descending gradient from that point, to meet as far as was possible the lower road levels on the south side. There would then have been a long and easy gradient, partly on the bridge, instead of the present short and steep one up to the bridge level. Mr. Carr admitted, however, that “he would have been a very bold man who had ventured to adopt such a course;” and I think we must all agree that the majestic character of Waterloo Bridge would have been much impaired thereby. Still it is a question whether the architectural dignity of the bridge should or should not have been impaired for that practical consideration, a question which might perhaps enter into our discussion to-night.

In regard to the second point, the treatment of the soffit of the arch, this will depend somewhat on the general style of the design. In those bridges which are what is generally called Classic in architectural character, it seems almost a matter of course that the arch should be built with a plain flat soffit; and as there is no constructional advantage in doing otherwise, there is perhaps nothing to be said against this treatment when it is in harmony with the rest of the design. Certainly nothing in the way of ornament should be introduced on the underside of the arch, which is the constructive portion of the bridge, and should have an appearance of rock-like strength and stability. But if a bridge be designed with any of that more stern and sinewy character which we associate with Gothic work, the method frequently employed, as already observed, in Mediaeval bridges, of building the arch in parallel groins with a recessed surface between them, certainly gives additional force to the design, and may even be a saving in material, though such saving would no doubt be counterbalanced by the increased superficies of work on the groin ribs. This effect of parallel groins on the soffit has actually been adopted in some of the modern bridges with iron arches, the arches or cantilevers forming visible ribs, in a manner which is perfectly logical as an expression of the construction.

The pier of the bridge has been the great crux, in the architectural sense, of bridge designers, and it is where the modern bridge-builder most frequently fails, owing mainly to a departure from simplicity, a desire to do something clever and “handsome.” As before observed, a bridge must have a cut-water on the lower portion of its piers in the direction opposed

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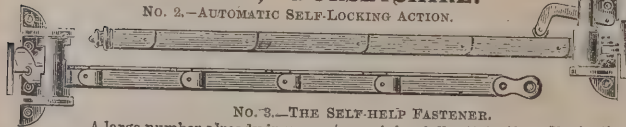
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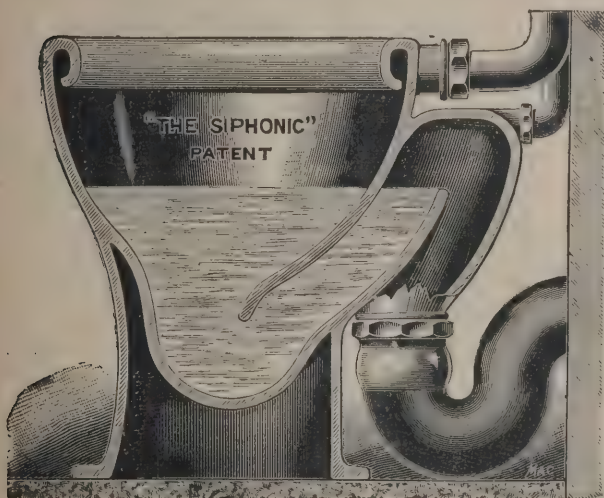
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to the current; and in many old and simply designed country bridges the whole pier towards the current was built out at an angle, ending in a sharp point, and either carried up in this form to the parapet, forming a triangular "refuge," or stopped below the parapet by set-offs and becoming a triangular buttress. The down-stream side of the pier would be left flat. We must all have noticed such bridges in stone-building districts, and observed their picturesque effect. There are instances to be found, I think, among old bridges, and certainly among modern ones, where bridges in a running stream have been built with a cut-water both up and down stream—for symmetry, I suppose. It is better, no doubt, that the water should have a curve to run round uniting on the down-stream side of the pier, or it may wear away the angles, but it is quite sufficient for this purpose to make a semicircular finish to the plan of the pier on the down-stream side; there should be nothing like a cut-water, which should be confined to the up-stream side, otherwise you lose a natural source of character in the design. In the larger bridges which are erected over large rivers and in connection with large cities, the cut-water form is now seldom or never carried higher than is necessary to clear the highest water-level of flood or tide; to do more would be a serious waste of material in a bridge on a large scale. There is, however, a general sense that it is in the fitness of things that the pier should be emphasised by carrying its face beyond the face of the arch, both to divide the arcade in an architectural sense, and to give both the appearance and the reality of greater weight and mass to the pier. How is this emphasis to be expressed architecturally? In the Pont Neuf at Paris (a small bridge compared with our London ones) the treatment is very simple and very effective; the cut-water form is carried up to a considerable height and a semicircular balcony is corbelled out from it. The semicircle is a better form for an alcove or refuge than the triangular space which would be given by the shape of the pier itself; and the whole arrangement is both picturesque and practical, but it would not apply to bridges of such large scale as ours. There we have to leave the greater part of the cut-water as a bare shelf, bevelled or curved to allow any water that may get on it to run off, only the portion close up to the pier is generally treated as a square plinth to receive whatever kind of projection of the pier we may put on it. Now, constructively, this projection of the pier is, if anything, a buttress, for any constructive function that it can have is to increase the lateral stability of the pier, and it might quite suitably be treated as a buttress,

and sloped off to the main plane of the bridge. Most of our large modern bridges being, however, on Classic lines, the buttress would seem to be out of keeping as a matter of style, and in that case the simplest and most effective treatment is just to project the whole mass of the pier outward as a square projection, carrying the cornice round it. This is the way it is treated in London Bridge and Putney Bridge, and in some of the best of the larger up-river bridges—Kingston, for instance. But with too many of our modern bridge-builders there seems, unfortunately, to be a rooted idea that this projection of the pier is a place designed by Providence for the display of the columnar orders in some form or another. A couple of flat pilasters on the projection might give it a certain architectural grace without robbing the structure of its solidity, though certainly detracting from the appearance of power; but to put detached or semi-detached columns in place of the projection of solid masonry is to deprive the pier of the effect of mass, and to place a feature intended to support vertical weight in a position in which what you really want is lateral strength. And when, as we shall see in some instances, even the advantage of the graceful proportion and effect of the Classic column is abandoned, and short thick stumps are introduced, the result becomes palpably absurd as well as ugly.

The cornice of the bridge, if it is a bridge of Classic type, should range with the level of the roadway, representing the crown of the solid construction, so that the parapet can be designed equally for inside and outside appearance. The cornice should be of bold and simple character, as befits a grand engineering construction on a great scale; but on the other hand, we must guard against the mistake so often made in engineering works of seeking for "boldness" by means of mouldings of enormous size. The result of that is merely to make the work look coarse and to reduce its apparent scale. Engineers may no doubt shelter themselves behind the example of Michel Angelo, who did the same at St. Peter's; but that was one of Michel Angelo's mistakes. In regard to the parapet I think a bridge should always have a pierced parapet of some kind; a solid parapet gives it a heavy appearance, a pierced parapet offers a pleasing contrast with the heavy masses of masonry of the constructional portion, and at the same time marks the fact that it is an addition, and not an essential portion of the construction. But the more simple the design of the pierced portion the better; an exceedingly ornate parapet design is out of place, and seems to force itself on the attention too much, besides detracting from the



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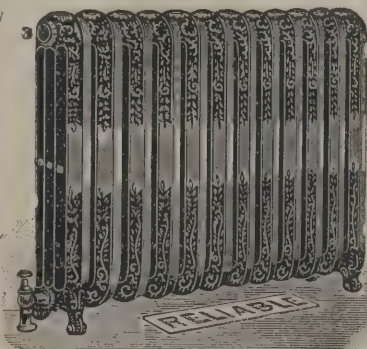
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breadth and solidity of effect proper to a bridge. Unless a bridge has something decidedly Gothic in its general design, there is really nothing better for the position than a simple repeating baluster of the Italian type. The lamp standards should be placed over the piers, not in the centre of the arches. They are so in all the older bridges as far as I have observed; it seems to have become a modern practice to place them over the centre of the arch—a mistake both architecturally and practically. On the pier they assist in emphasising its vertical line, and seem in their proper place architecturally, and while the position makes no difference to the traffic on the bridge, it is certainly better for those in boats passing under the bridge to have a cross light from both sides of the arch than a single one over their heads.

It may be a question whether the spandrels of the arches should be regarded as a field for the introduction of ornament. I can only say for my own part that I can hardly imagine any kind of design for a monumental stone bridge which would not be spoiled and weakened in effect by cutting up the spandrel with ornament. In the case of bridges with iron cantilevers the space between the upper and lower member no doubt seems a suitable one for an ornamental filling, though the efforts that have been made in this direction have not so far conducted to the happiness of the spectators. Where there is a sufficient mass and projection in the piers it may be suitable enough to place a niche and a statue, provided that you are going to afford sculpture of the highest class and of a grand type of design.

The latter part of the paper Mr. Statham devoted to a detailed description of the history and constructional details of the London bridges, old and new.

Mr. W. D. CAROE proposed a vote of thanks to Mr. Statham for his paper, which was supported by Messrs. Halsey Ricardo, G. H. Fellowes Prynne, B. F. Fletcher, S. B. Beale, and passed by acclamation.

The paper was illustrated by lantern slides, and there was a good attendance of members.

In consequence of our not receiving a copy of Mr. Statham's paper in time, it was unavoidably left over. We have, however, much pleasure in giving the above extract of his very interesting paper.

THREE plans for a new covered market at York have been prepared by the city surveyor, and will be submitted at the next meeting of the Corporation.

UNINHABITABLE AND INSANITARY HOUSES.

A LECTURE on "Uninhabitable and Insanitary Houses: Some of the Causes, and a Remedy," was recently delivered by Mr. William Stevenson, house factor, Leith, before the Unionist Club. He said:—The subject of the paper I have to read to you is "Uninhabitable and Insanitary Houses." I propose first to point out what I consider some of the primary causes of houses becoming unhealthy; and second, I shall suggest what I think would be a successful remedy. You will naturally expect from the nature of my vocation that I have given this subject some consideration. The subject is one which could not be lightly passed over by anyone in the same occupation as myself. I have studied it in various ways and from many sides, and have arrived at conclusions and have formed opinions which I hope are in the main correct.

Before entering into the discussion of the subject, and putting before you my opinions and conclusions, I desire to mention at the beginning that this same subject of unhealthy houses has been recently discussed by two very eminent and learned gentlemen, each on different occasions and in different towns. At the Sanitary Congress, held in Glasgow in August last, Dr. Russell, medical officer of health for Glasgow, read a paper on "Uninhabitable Houses: Who inhabit them? Who own them? and What is to be done with them?" In that paper Dr. Russell laid the blame for unhealthy houses on the immoral compact entered into between the tenant and the landlord, and that this compact was leading landlords, factors, trustees, beneficiaries, bondholders and tenants down the broad road to perdition. On a more recent occasion, at Birmingham, this same question of unhealthy houses was made part of the groundwork and foundation of a great political speech by Mr. Chamberlain. He implied that houses became unhealthy because every man was not his own landlord. His words were, "I want to deal with the individual home. What is the best security and guarantee that the home of the working man shall be comfortable and shall be healthy? It is that a man shall be the owner of his own dwelling."

On a subsequent day at Durham he said that his proposal was put forward to elicit discussion and criticism. I have read the statements of both of these gentlemen as they appeared in the newspapers, but I have failed to find that either of them has studied the question to its foundation or traced the disease to the first cause, and thus neither has been able to put



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forward a satisfactory specific for remedying the evil complained of.

I will now proceed to discuss the question as I understand it, and in doing so, it is to be understood that I am dealing more particularly with Scotland, and specially with Edinburgh and Leith, where I have the more practical knowledge. I have little practical acquaintance with English houses, and do not deal with them on their merits. Every man his own landlord and the owner of his own home is not a new cry and watchword, but a very old one indeed, and dating back for at least fifty years or more, and for the last forty-five to my own personal knowledge. It is an old story, and one which has been fostered and nursed by all kinds of building associations, loan societies and companies of a kindred kind. Edinburgh and Leith, where these societies have been sown broadcast, are peculiarly applicable as evidence of the success or non-success of the proposal "that the best security and guarantee that the home of the working-man shall be comfortable, and shall be healthy, is that every man shall be owner of his own dwelling." I question if any two towns can be found in the kingdom where, from the house of the ordinary working-man and artisan, up through the middle to the more wealthy classes, so large a proportion of houses is owned, and has been owned and occupied by their owners. The owning and occupying by their owners, of single houses in Edinburgh and Leith, is not a thing of yesterday but of generations back.

Within the last twenty or thirty years whole streets of new houses have been built in new and in suburban localities, suitable for occupation by the artisan, and by others higher in the social scale, and have been sold, to be so owned and so occupied by their owners. Houses of a less pretentious and imposing kind than the ordinary tenement have also been put up by building companies and by other builders, and with plots of ground, and have been disposed of to be occupied by their owners. The advertising pages of the newspapers afford indisputable evidence of the extent to which individual ownership of single houses prevails. The newspaper columns are filled with flats, half-flats and single houses for sale; but full and complete tenements, put into the market, are comparatively few indeed. It may be true—at least it cannot be gainsaid—that all these houses, when first built, were considered of the most perfect construction, and were supplied with the most modern sanitary appliances of the times. But do we find on inquiry and investigation that all these houses, which were

bought by their owners for their own homes, are still in a healthy, sanitary and comfortable state, according to present-day requirements? Is one-fourth of the houses built within the last fifteen or twenty years now in such a condition of repair and of sanitary convenience as will fully meet the requirements of tenants, and stand modern scientific tests and requirements? If I am right in my conclusions and in the statements which I put before you, then the proposition "That every man, the owner of his own home, makes healthy and comfortable houses" is a fallacy and a delusion, and will not bear investigation. This fact leads me to consider and inquire how it comes about that the houses which have been built, even at a very recent date, and which, when built, were constructed on the most approved plan, and fitted with sanitary appliances and other modern conveniences of the then most perfect kind, should in a very few short years become, so to speak, unhealthy. In house property we have a commodity of human construction, capable of almost indefinite increase; but a commodity, immediately on completion, subject to decay and deterioration, and from the very first requiring constant care and attention to keep it in repair and order. If we exclude premises owned and held for manufacturing and mercantile purposes, and confine our inquiries specially to house property, I think it will be found that comparatively little is held in ownership by the upper or wealthy classes, but that it is held by the lower or less wealthy classes, not for speculation, but as a sure and safe investment, and held by persons who have acquired the means they are possessed of by care and frugality, and who have invested the whole or nearly so of their means in property as a competency for old age for themselves and wives, and with the expected reversion to their families or relatives after their death. In the investing of their carefully-gathered means little account has been taken of, and no provision has been made for, the continual outlay required for the repairs and upkeep which is necessary on house property. If money has been borrowed on bond or mortgage, as is often the case, the strain on the resources of the holding to make all ends meet is excessive. Every penny possible requires to be exacted from the rents by the owner or the life-renter. Not more than what is absolutely compulsory is expended either on repairs or improvements. The better class of tenants gradually remove to houses of more recent construction, and where they find the more modern appliances and conveniences. The houses have to be let to a class of more undesirable tenants, and gradually the property gets into disrepair, and from bad to worse goes down the hill

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till ultimately, when it reaches the beneficiary, it is scarcely worth having.

In the case of tenement or other blocks of building owned by a separate individual, for every separate house, and having many rights in common, repairs cannot be easily executed, except under compulsion of the authorities, and then only of the barest needs, and at a cost out of all proportion to the amount of work done. All this, perhaps, from the want of means by some or want of inclination by others of the common owners. If one owner desires improvement of his holding or the introduction of some more modern convenience or sanitary appliance, he is handicapped in his attempt to effect it, except at an inconvenience and cost disproportionate to the value of the alteration wanted. There is little or no control over the introduction of undesirable neighbours, and by the introduction of such persons the neighbourhood becomes deteriorated. The dissatisfied leave the place, and either sell their house at a loss or let it at what rent can be got and to such tenants as they can command. And so this neighbourhood also gradually goes down the hill and becomes an undesirable locality. Owners of single houses and property in common are handicapped at every corner against keeping their holdings in a good and healthy condition and repair by the disregard, carelessness, or impecuniosity of their neighbouring owners. Many owners of their own houses, and who are sensible of the insanitary and uncomfortable condition of their dwellings, continue on from year to year to occupy them, well knowing and hiding their defects because of inability to meet the outlay, or perhaps a want of desire to effect the improvement, and it is only after the property is put into the market for let or for sale that the defects are found out.

In all large trading or manufacturing concerns managed on true business principles a certain portion of the profits are yearly set aside to meet depreciation, and for repairs and renewals. This is specially the case with our most successful shipping companies. I have never yet found any such thing as a reserve fund of this kind with individual owners of house property. Herein lies a pertinent cause of uninhabitable and insanitary dwellings. I have pointed out how liable house property is to decay and to deterioration. But hitherto it has been held as if it were an investment practically incapable of decay or deterioration, and as if after having been once built it were incapable of improvement, and had no necessity for any reserve funds for effecting these objects—in short, held on rule of thumb, and on no business or commercial principle what-

ever, and no provision or calculation made for decay. Building and other loan societies, and the easy facilities with which loans can be got on mortgage over house property, are much to blame for bringing into the field of ownership large numbers of impecunious persons, and who have not the wherewithal to hold on business and commercial principles the property they have acquired, and to maintain it in that state of repair and health which is required, even when they have the desire and knowledge to do so. Many persons become owners of their own houses and of property who have never counted the cost on any sound business system.

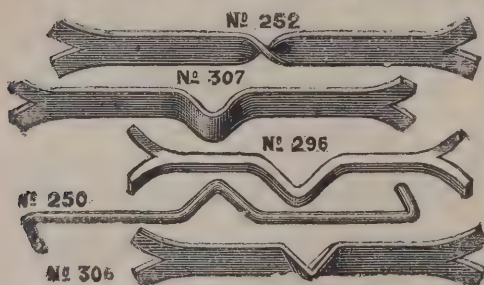
There are most certainly, and it would be a pity if it were not so, very many individual owners of house property who hold their property as an investment, and who during their own lifetime and with their own sanction, have the greatest care and concern that their properties should be always kept in the highest and most perfect state of substantial repair. But the life of every person is an uncertain commodity, and when that passes away, then comes other rules and other modes of management.

The leaving of property in life-rent has hitherto been a fruitful cause of rapidly leading property to decay and ruin. A life-renter has no interest in many cases in maintaining the property in any better repair than is sufficient to take as much out of the holding as possible. Needful repairs are executed with a grudge. Any substantial improvement which would retain a good class of tenants is absolutely refused. One by one the good tenants remove, and their place is bit by bit refilled by a lower and still lower class of tenants. The property itself not only goes to decay, but the neighbourhood and neighbouring properties become deteriorated past recovery at the same time.

The carelessness and indifference of tenants, and not infrequently wilful destruction by them of property, is becoming more and more every year a burning question, and one which will in the near future have to be sternly faced. The destruction from carelessness and indifference is not confined to the lower class of tenants, but is a cause of complaint against many of the would-be upper class, and whose standing and position lead to an expectation of better things.

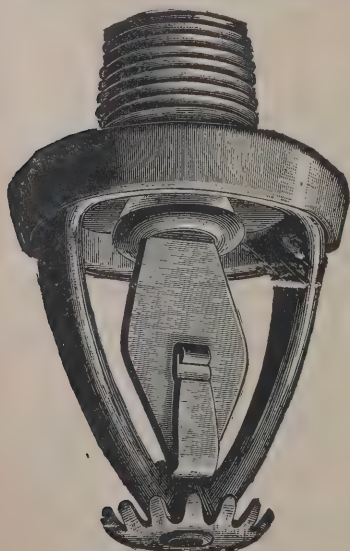
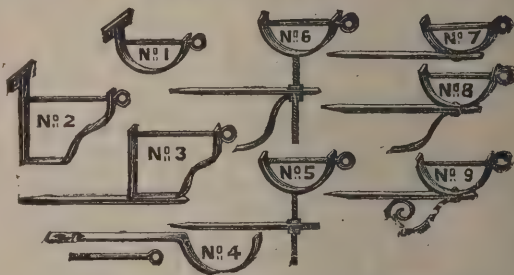
Neighbouring owners, I have said, and as I have good reason to know, are often the cause of the deterioration of a neighbourhood. Thoughtless and regardless modes of management lead to serious loss to other owners who have the best intentions.

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Trustees holding for beneficiaries and heritable creditors in possession have hitherto been seriously handicapped in keeping and maintaining property in a good and lettable condition, and abreast of modern improved requirements. They had power only to do necessary repairs. When mortgages had been foreclosed it was a certainty that the free income from property had been insufficient to meet the interest. In such cases it was almost hopeless to expect improvements or any repairs beyond that allowed by law. The buildings may have been good and substantial so far, but by the inability of the holders to introduce from time to time better and more modern conveniences it is found impossible to retain the best class of tenants. They migrate to where these modern conveniences are found. The Heritable Securities Act, just become law, will substantially improve the position of heritable creditors in possession.

The speculative and the jerry-builder is the back on which is most often laid the blame for unhealthy and insanitary houses. The speculative builder is not an article of self-creation. He was brought into existence to meet the demand for a cheap and flimsy article. He is not to be blamed for providing the article wanted by impecunious buyers, greedy of big interest and big bargains, and who have neither the knowledge nor the desire to appreciate a good and substantial article—the best value in the end. He is the counterpart of the Cheap Jack, and owners of the slop-shops on the bridges and elsewhere, and who supply the demands for the cheapest clothing and other articles. Even Mr. Chamberlain in his speech at Birmingham stated that he had been in search of a Cheap Jack, and had found one who could supply the very best article in the market in the way of healthy houses for working-men at 140/ each.

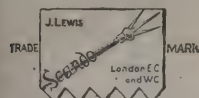
In the preceding remarks, if you will allow me shortly to recapitulate, I have pointed out that the owning of their own homes by the occupiers have not been successful in making healthy and comfortable houses, but, on the contrary, has specially contributed in Edinburgh and Leith in making houses unhealthy and insanitary. I have pointed out that the system of leaving property on life-rent is another of the causes which contributes to the same end. I have shown that the holding of property by bondholders and by trustees assisted to the same end. I have also shown that even the individual owner of property having the best intentions, and because of neighbouring owners and the uncertainty of his own existence, and because of the inability to control what may come after him, is unable to prevent the very best class of property from becoming

unhealthy, and I pointed out that a serious factor in the question is the universal want of any reserve fund on which to rely for effecting repairs and renewals. These and the want of a perpetual and continuous system of management, continuing on from year to year in perpetuity and without a break, all lead to the same end. Experience has thus taught us in the past, and the reports of medical officers of health and sanitary inspectors tell us in the present, that individual ownership of house property has been unable and unsuccessful in its management in preventing property becoming the slums and the rookeries of our towns.

I now come to the second part of my story and the more pertinent point—the remedy which I would apply. If my indictment against the holding of property privately or by individual owners is found to be relevant, and if the proof which I have set before you brings in a true bill, as I hold it does, then I submit that all individual and private ownership in house property in towns should cease and terminate. I make the recommendation advisedly, unreservedly, and in its broadest sense to all house property having common rights. In the owning of property for letting purposes I would exclude the State; I would exclude municipal authorities and every other elected body elected by the ratepayers for administrative purposes only. The constitution of all such bodies unfits them for the management of commercial and mercantile undertakings.

I would like to see, and I recommend that the owning of house property be taken up by joint-stock companies, or such like corporations, or by some kind of syndicate, and which might be limited and might be co-operative. In the formation of such companies and corporations there could be no risk if judiciously gone about. The property would be managed from year to year on uniform and business principles, and with perpetual succession in the management—uniform, continuous, not erratic, spasmodic and uncertain. The dividends would be paid half-year and half-year, uniform and of known quantity, with sufficient reserve for all emergencies or improvements and for renewals. I see no reason why working men of all classes should not join in and invest their frugal savings in such a manner from the single one pound and upwards. Such investments would not be speculative—expected to yield from 6 to 10 per cent.—but I see no reason why a uniform and constant dividend of 4 to 4½ per cent. should not be made. In such companies owning whole and undivided blocks of houses, and having no mutual obligations, improvements in internal arrangements and fittings, and the introduction from time to time

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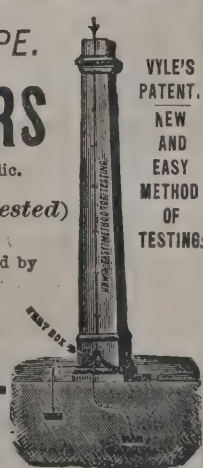
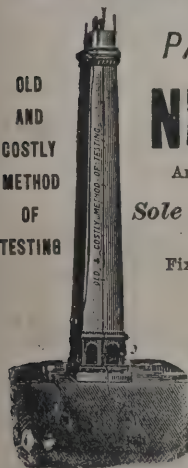
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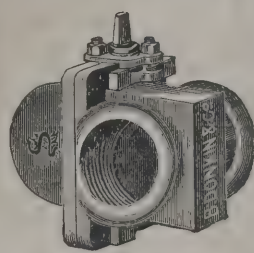


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of the most modern and approved sanitary appliances, could be done with perfect facility and freedom, as it was found that such became necessary and advantageous for maintaining the houses in the best and most forward condition; and by always keeping the houses in such forward condition, retaining and keeping the best class of tenants, and by keeping a good class of tenants, maintaining the locality also in a high-class position. In such companies or corporations shareholders and members could with every confidence bequeath the life-rent to one person and the fee in reversion to others, knowing that the life-renter would have no control in deteriorating the principal, and that the fee would go down to the reversionaries unimpaired, and in the same substantial condition in which it was left at the date of bequest.

The model after which I suggest construction is the insurance companies and the Scottish bank. Intelligent and energetic artisans would be of the utmost use in the management. Their training in various trades connected with property would make them so. And if we are to believe in the success of the co-operative enterprise and benefit societies, it is manifest that they have business capacity.

I have been unable to find out the existence of any kind of company or association in Scotland of the nature or constitution I recommend, except one in Glasgow—The Glasgow Workman's Dwellings Company, Limited. It has been in existence for a short time only, and on June 30 last they issued their first full year's statement of accounts. Through the courtesy of their secretary I have been furnished with a copy of that report and with other documents relating to the company. The paid-up capital is nearly 15,000*l*. After paying all expenses for the year, one-third of the preliminary expenses in forming the company, a dividend of $3\frac{1}{2}$ per cent. was paid. 198*l*. was placed to a reserve fund, and 36*l*. was carried forward to next year. The company's operations consist chiefly in buying up old and insanitary property, and, after putting it into a perfect state, letting it out. The rents are all weekly, and from 2*s*. to 3*s*. This company is perhaps of a semi-charitable nature, but it is substantial proof of what can be done with even the lowest class of property, and with the poorest but decent labouring classes. It is providing them with good and healthy houses, and it is paying the shareholders of the company an honest dividend.

It has been decided to light the choir and nave of Bristol Cathedral by electricity.

EXTRAVAGANCE IN COUNTY COUNCIL VALUATIONS.

THE following important letter to Mr. Boulnois, M.P., from Sir Peter Edlin, Q.C., who, as chairman of the London Quarter Sessions, is better acquainted with the subject than any expert, reveals how enormous is the waste of money every year in consequence of the unscientific procedure adopted for the "valuation" of property in the Metropolis by the County Council:—

"64 Queensborough Terrace, W. : February 23, 1895.

"Dear Mr. Boulnois,—I duly received your note of yesterday, and need scarcely say that I followed its lines with much interest. I am naturally reluctant to refer to the subject-matter—in short, for reasons that will appear, it is repugnant to me; but there have been so many and such gross and persistent misrepresentations publicly made with regard to the appeals brought by the London County Council to the Court of Quarter Sessions against the totals of the valuations of several of the London parishes and unions, that it is desirable, from every point of view, that the actual and more material facts should be known and correctly appreciated, and more especially so by those whom, like your constituents, they so seriously affected.

"These appeals, twelve in number, were instituted after the last quinquennial valuation for the purpose of raising the totals of gross and rateable values as they had been settled by the assessment committees respectively after appeals to special sessions, the ulterior object of the Council, and doubtless the actuating motive, being to increase the sums upon which the county rate would be leviable, and thus enable them to levy a larger amount without raising the nominal rate; or possibly to reduce the nominal rate, for of course the larger the aggregate total of the Metropolitan assessments the smaller need be the rate in the pound requisite to meet the Council's expenditure.

"It may appear incredible, but it is a fact nevertheless, that in these twelve appeals the Council presented no less than 38,307 impeachments of separate valuations, relating to as many distinct hereditaments, alleging that in respect of each of them the assessments of gross and rateable value were too low. In no case did they complain of any assessment being too high. Even if the objections for under-valuation were well founded, the injustice of this exclusive and partial selection could not escape notice. In some instances the increase demanded in rateable value did not exceed 5*l*., and it was admitted that, although the 'totals' were raised, the actual valuations of the



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individual hereditaments would remain unaltered. Now it is obvious that each of these impeachments presented separate issues, and had it been possible for the Court to try them they would have sufficed to occupy it day by day for a dozen years or more. In short, these appeals, irrespective of their being based upon an entire misconception of the law and of legal right, were absolutely and manifestly impracticable. Let it be observed, by the way, and pardon me if I interpose the remark, that they constituted a portion of the work which the Council imposed upon the judge of the Court, to whom they were at the same time refusing to accord a proper salary.

"In saying that these voluminous appeals were brought upon an utterly erroneous view of the law, and of the legal rights of the Council under the Metropolis Valuation Act, 1869, I convey, as concisely as may be, the opinion expressed in the respective judgments of the Master of the Rolls and the Lords Justices of Appeal, as well as by the House of Lords, in the St. George's Union case (*vide* Law Reports, 1893, 2 Q.B., 476, and House of Lords, Appeal Cases, 1894, p. 600).

"But—as I have been repeatedly asked—what has to be said with regard to the costs to the community of these useless and abortive law suits? Here certainly we have a question of interest to every ratepayer. The Council itself refuses to disclose the actual figures—as you observe, members have been unable to elicit them from the responsible officials; but I am informed by those who have carefully followed all the legal and other proceedings that the total cost to the metropolitan county of these appeals cannot possibly have been less than 50,000*l.* Indeed, a gentleman professionally connected with one of the respondent unions has publicly stated that the total expenditure upon them will amount to not less than 75,000*l.* I assert unhesitatingly that for any eventually useful public purpose whatsoever, as many English sovereigns drawn from the pockets of the ratepayers might just as well have been thrown into the Atlantic Ocean. There will probably be some inquiry relative to this matter in Parliament, but the more widely the facts and circumstances are known the more correctly will metropolitan ratepayers appraise the claims upon their gratitude of the promoters of these extensive and expensive lawsuits.

"The prolonged litigation foreshadowed in these appeals when notice of them was first given, and the enormous expenditure on both sides that would inevitably attend the prosecution of them, might well alarm the local authorities, and before there had been any judicial expression of opinion with regard to the

law applicable the respondents in seven of them came to terms with their opponents, orders by consent being made by the Court; but, except in two cases, no order as to the costs of the appeal. Of these seven, therefore, I will say no more than that the costs to the parties respectively must have amounted to a very considerable sum.

"But as to three of the other appeals the results have been disastrous. In the parish of St. Marylebone the Council impugned 3,610 of the assessments upon the ground of undervaluation, each of these enumerated objections, as pointed out, raising distinct issues. I gave twenty-seven days to the hearing of this one appeal, and again and again I drew the attention of the learned counsel appearing for the appellants to the inevitable futility of the proceedings—be the opinion of the Superior Court upon the fundamental legal question underlying the case what it might; and again and again I deprecated further expenditure of money upon it. I would refer to contemporaneous records in proof of this—*vide The Times* (Law Report) for Monday, November 28, 1892, and for Tuesday, December 13, 1892. It appears from the former report that it was calculated that if the Court were required to determine each of the three thousand and more issues raised in this suit the folio volumes in which the shorthand notes of the proceedings were daily transcribed would stand one upon another 11 feet high. But protests, warnings and remonstrances were in vain; be the consequences what they might, the Council were determined to go on. Not until the Lords Justices had delivered their judgment upon the prohibition rule in the St. George's case would the County Council desist from the further prosecution of their appeal against the St. Marylebone totals. Then, of course, the abandonment of it became imperative, and the appeal was dismissed, but the Court of Quarter Sessions was not asked to make any order as to the costs on either side. It appears that the costs to the parish only of this appeal were 6,900*l.*, but the total expenditure of the Council upon it must have very considerably exceeded that sum. The figures given at a recent meeting of the Council—5,773*l.*—would be of only partial application, inasmuch as when the appeal was first proposed, and before it could be actually brought, a preliminary fee of 3,000 guineas was paid to their surveyor, and fees of 500*l.* to each of his three assistants. Added to which the establishment charges, consequent on the requisite augmentation of the staffs in the solicitor's and surveyors' departments for preparing and collating the voluminous schedules and other documents, must have been very heavy.

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"Passing from St. Marylebone we come to the St. George's Union case, in which the respondents obtained the rule for a prohibition. Notwithstanding the unanimous judgments of the Master of the Rolls and the Lords Justices, the Council appealed therefrom to the House of Lords, and with the like result—again their appeal was dismissed, and they were ordered to pay all the respondent's costs, including, of course, those incurred in each of the Courts below. The total amount of the money expended in the persistent prosecution of this hopeless appeal may never be precisely ascertained, but it can scarcely have been less, it was probably more, than what was thrown away in the St. Marylebone case. The chairman of the Local Government and Taxation Committee admitted, at the meeting of the Council on the 29th ult., an expenditure by the Council on this appeal of 3,998*l.*, to which have to be added the costs of the respondents, which had not then been taxed, but which have since been ascertained to amount to 8,000*l.*

"There is enough for reflection in what is above stated, but there still remains for mention the reckonings in the City of London appeal. This also, in view of the judgment of the House of Lords, had, of course, to be abandoned by the Council. There was a justifiable item in it in consequence of arithmetical errors, but as to the substantial issues presented it was on all fours with the other suits, no less than 1,107 valuations being impugned, including those of a hundred or more of the principal hereditaments in the City; and as must be apparent, the costs incurred in instituting this proceeding and in resisting it must have been very large indeed. It was, of course, ultimately dismissed, though for the reason above stated, with cross-orders as to the costs on balance much to the disadvantage of the appellants.

"There should be no concealments with regard to the matters dealt with here. The Council's surveyor, who received the fee above mentioned for furnishing materials in the St. Marylebone case, was doubtless one of an expert staff similarly remunerated for the like purpose in the other metropolitan parishes or unions; and if the entire cost to the metropolis—the bills of the respective respondents as well as of the appealing Council—could be approximately computed, and the sum total presented to the public eye, the obligations of the electors and ratepayers to those who, in the exercise of a brief authority, thus persistently wasted public money in speculative litigation and abortive lawsuits, would be properly appreciated.

"Be it borne in mind, too, that although in some instances the parishes may have been recouped for the costs incurred in

defending their position, each will nevertheless have to contribute to the rate levied for the Council's disbursements.

"I am desirous, as far as possible, of dissociating my individual part and action as chairman of the County Sessions in respect of these matters from the grave public interests involved; but my relation to the County Council is unfortunately notorious, and it is with some satisfaction that I point to the Law Reports in refutation of the falsehood insinuated, that the Court of Quarter Sessions did not from the first take the same view with regard to the untenable position assumed by the Council in these suits as was afterwards expressed by the highest legal authorities.

"I remain very truly yours,

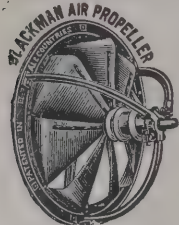
"P. H. EDLIN.

"Mr. Edmund Boulnois, M.P., &c."

NOTTINGHAM MASTER BUILDERS' ASSOCIATION.

MEMBERS of the Nottingham Master Builders' Association assembled in large numbers at the Lion Hotel, Clumber Street, on the occasion of the annual dinner of the Association. In the unavoidable absence through indisposition of the president (Mr. Enoch Hind), the chair was occupied by Mr. George Fish. The vice-president (Mr. James Wright) filled the vice-chair, and those present included Messrs. J. J. Adams, T. Barlow, A. G. Bell, T. Cuthbert, Dennett & Williamson, Gilbert & Gabbittass, Gell & Son, A. Hinsley, W. Hall, L. Lloyd, G. A. Pillatt, A. Priestley, R. Simpson, J. Shaw, J. W. Woodsend, Buxton & Attewell, C. Taylor, J. H. Vickers, W. Maule, Dennett & Ingle, John Walker & A. Brown, and J. Whitehouse (Derby Master Builders' Association) and F. Atkin (secretary). Letters of apology for inability to be present were read from Messrs. Enoch Hind, G. J. Brownell, H. Vickers, R. Bulley (Birmingham) and J. Cooper.

The Chairman submitted the loyal toasts, which having been duly honoured, the Chairman proposed "Success to the Master Builders' Association," remarking that he was sure the members all regretted the absence, and the cause of that absence, of their president, Mr. Enoch Hind. In proposing success to the Association, he thought he might say that the builders in Nottingham had been very much "out in the cold" for a long time, but there now seemed to be a prospect of better weather and also plenty of work in the town. He must tell them that what had been done during the past year had not been all that



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could be desired. When he addressed them on the occasion of the last annual dinner he said they were desirous of establishing a uniform code of working hours. So far that had not been brought about, but he hoped that during Mr. Hind's tenure of office they would be able to accomplish it, so that all trades might commence work and finish at uniform hours. The financial condition of the Association, he was pleased to say, was very flourishing. They had gone to considerable trouble in working out a schedule of prices during the past year, and they were hoping that a deputation from the Association would shortly meet the architects in the town on that subject. There was no doubt that such a schedule of prices as had been compiled would prove of great benefit to the master builders of the Association. A deputation of the Association had met the borough engineer in regard to matters relating to drainage, and it was purposed to meet the works and ways committee and the engineer with respect to the by-laws of the town. Further than that, the Association had had before them several important matters bearing upon the building trade, and it behoved the members to hold together and to give every support to their President during the ensuing year. He was pleased to say that the greatest good feeling existed between the masters and workmen in the building trade in the town, and also between the master builders and the local architects, and it seemed to him there was every prospect of success for the Association and the building trade.

Mr. J. W. Woodsend responded. It was, he said, but a natural desire on the part of that Association to endeavour to improve their trade and the conditions under which they worked. It was a matter for congratulation to know that the Association was in such a sound financial condition, and also to hear from the chairman the good work which had been done by the various deputations during the year. As a member of those deputations he could bear testimony to the kindness and courtesy with which they had been received by the borough engineer, and he felt sure that the architects in the town were quite in accord with the objects of the Association. He believed they felt it was a right thing for the builders to combine together, and that they would assist the Association as far as they possibly could. It was only a laudable desire on the part of the master builders to so improve the trade as to insure for them a balance on the right side at the end of the year. He wished to emphasise the fact that the architects and the borough engineer had treated them with courtesy, and that so far they had worked in perfect harmony with them. The

Association would shortly approach the architects with regard to the schedule of prices, and he felt sure they would do what they could for them. When he first became connected with the Association they experienced considerable difficulty in getting builders to join, but he was proud to say their membership was now something like fifty. In Mr. Hind they had a man of great energy and ability, and he believed the Association had every chance of a successful career.

Mr. James Wright proposed "The Town and Trade of Nottingham," remarking that though the builders had gone through a period of depression in trade, there were encouraging signs of an improvement in the near future.

Mr. Woodsend responded, and said the Corporation had done very much to improve the town during the last thirty years. With regard to the depression in trade which they had had to deplore for so long, he was fully convinced that one of the most formidable forces which the trade and commerce of this country had to contend with was the paid agitator. With the genuine working man he had every sympathy, but he was sure that the agitator was more responsible for the bad trade than anything else.

Mr. Williamson proposed "The Visitors," to which Mr. Walker responded.

LIGHT AND AIR CASE.

AN appeal was heard in the Court of Appeal, *Wasson v. Pawson & Leafs, Limited*, against a decision of Mr. Justice North in the action brought by Messrs. Wasson & Fawell, of St. Paul's Churchyard, against Messrs. Pawson & Leafs, Limited, of the same place. As we reported lately, the plaintiffs claimed an injunction to restrain the defendants from erecting and raising their new building in Dean's Court, Doctors' Commons, so as to darken, injure or obstruct any of the ancient lights passing to the plaintiffs' premises, and also from permitting to remain any building already erected which shall cause any obstruction to the said ancient lights. The plaintiffs also claimed damages. A motion was now made on behalf of the plaintiffs for an interlocutory injunction until the trial of the action or further order, in the terms of the first part of the plaintiffs' writ, excluding the mandatory part. The defendants' premises are very extensive, comprising a number of houses in St. Paul's Churchyard and some in Carter Lane. The defendants have recently



A MEM.

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obtained from the Ecclesiastical Commissioners a new lease of a portion of their premises, on the terms (*inter alia*) of rebuilding that portion, and in so doing they propose to raise their new buildings to a considerably greater height than the old ones. By this alteration the plaintiffs allege that the access of light to their premises will be seriously obstructed. The defendants, on the other hand, deny that any material injury will be inflicted upon the plaintiffs. The new buildings have been commenced. There was a great conflict in the evidence, as is usual in cases of this kind. The plaintiffs' most serious complaint was that the defendants' new buildings would obstruct the access of sunlight to a small office or room, 10 feet by 7, which had been used for years as a room for sampling and examining cloth, for which it was said sunlight was absolutely necessary. The defendants were proposing to set back their buildings 10 feet, but to raise them from 44 feet to 84 feet. Mr. Justice North granted an injunction until the trial of the action or further order, though he was by no means certain that the plaintiffs would succeed at the trial. But, on the balance of convenience and inconvenience, he thought the better course was to grant the interlocutory injunction. He required the plaintiffs to give the usual undertaking as to damages. The defendants appealed.

The Court dismissed the appeal.

Lord Justice Lindley was of opinion that Mr. Justice North had arrived at a proper conclusion. With great respect, however, he thought the learned judge had understated the amount of obstruction of light to the room or office in question. His lordship would not stop to comment on the difference of opinion between the professional witnesses; but what struck him very forcibly was the evidence that the light in this room was actually diminished now, although the defendants' building had only been carried up at present 15 feet. That was a piece of clear and tangible evidence, and it stood absolutely uncontradicted; the light in this room was by no means what it was before. The room, though small, was an important one, being used for examining and sampling cloth. It was satisfactory to feel that, in affirming Mr. Justice North's decision, this Court was not giving weight to any mere fanciful injury. It was said that the learned judge had attached too much importance to the balance of convenience and inconvenience; but his lordship thought that, if the evidence at the trial stood as it now stood, the reasonable probability was that the plaintiffs would obtain their injunction. Then it was said that the injunction would cause very great inconvenience to the defendants. No doubt it

would. But they could go on with part of the building up to the old height, and there they must stop. In his lordship's opinion the plaintiffs had made out a *prima facie* case—a strong *prima facie* case—and the proper course was to dismiss the appeal with costs. It was obvious that there was a good deal behind, and his lordship hoped that the parties would come to some amicable arrangement.

Lord Justice A. L. Smith delivered judgment to the same effect.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 2949. John Bell Irving, for "Improvements in or relating to 'lobster back' chimney cowls."
- 2958. John Brides and George Walter Conchie, for "Improvements in sliding window-sashes and frames."
- 3044. Moses James Adams, for "Improvements in appliances for connecting and distributing the water-supply to sanitary and other appliances, and taking the waste therefrom."
- 3069. Harold Lyon Thompson Lyon, for "Improvements in locks."
- 3114. John Henry Cuttler, for "An improvement for securing window or sash-cords to window-sheets."
- 3159. Eugen Rittmeyer, for "Improvements in door-locks."
- 3177. Walter Thomas Christian, for "Improvements in window-sash and like fastenings."
- 3189. James Curtin, for "Improvements in ventilation apparatus."
- 3192. Frederic Cooke, for "Improvements in or relating to the disinfecting of water-closets, drains and other places."

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COMPETITIONS OPEN.

DURHAM.—March 25.—Competitive Schemes are Invited for the Sewage Disposal of the District. Premiums 100l. and 50l. for Two Best Schemes. Mr. F. Marshall, Town Clerk, Durham.

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ARDGLASS.—For Renovation of Parish Church Mr. E. N. Banks, Architect, 10 Chichester Street, Belfast.

AYR.—March 11.—For Erection of Buildings for Agricultural Show. Mr. J. McMurtrie, Secretary, 70 New Market Street, Ayr.

BACUP.—March 9.—For Construction of Sewers, with Manholes, Storm Overflows, Ventilators, &c. Mr. John Wilson, C.E., Borough Surveyor.

BERKHAMSTED.—March 11.—For Additions to Workhouse. Mr. Robert Bailey, Surveyor, Berkhamsted.

BLACKBURN.—March 29.—For Extension of Church Higher Grade Schools. Messrs. Stones & Gradwell, Architects, 10 Richmond Terrace, Blackburn.

BLACKPOOL.—For Alterations to Premises. Mr. John Mawson, Architect, 294 Lytham Road, South Shore, Blackpool.

BLANDFORD.—March 26.—For Erection of a New Chancel and Organ Chamber for Blandford Church. Mr. Chas Hunt, Architect, Blandford.

BOLTON.—March 9.—For Foundations for Higher Grade School. Mr. R. Knill Freeman, Architect, 17 Wood Street, Bolton.

BORROWDALE.—March 9.—For Additions to Board School. Mr. Thomas Hodgson, 27 Station Road, Keswick.

BRADFORD.—March 9.—For Building Seven Houses and Shops. Mr. J. W. C. Atkinson, Architect, 1 Ivegate, Bradford.

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COLCHESTER.—March 9.—For Supplying Road Materials, Sewer Pipes, &c. Mr. H. Goodyear, Borough Engineer, Stanwell Street, Colchester.

DAISYFIELD.—March 8.—For Stores, Offices and Assembly Rooms. The Secretary, Co-operative Stores, Peter Street, Daisyfield, Lancashire.

DARWEN.—March 11.—For Building Eight Houses. Mr. J. B. Thornley, Architect, 45 Market Street, Darwen.

DONCASTER.—March 8.—For Alterations to Front of Ladies' Stand at Racecourse and other Works. Messrs. Brundell, Simmons & Brundell, Architects, 1 Princes Street, Doncaster.

DORCHESTER.—March 22.—For Rebuilding Shops and Premises. Mr. Arthur Tilley, Architect, 16 Cornhill, Dorchester.

DOWNPATRICK.—March 18.—For Additions, &c., to Lunatic Asylum. The Secretary, Board of Control, Custom House, Dublin.

DUDLEY.—March 9.—For Building Board Schools, Eve Hill. Mr. Robert F. Matthews, 35 Carlton Buildings, Paradise Street, Birmingham.

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FORT WILLIAM.—March 9.—For Building Station Hotel. Mr. Dun Cameron, Architect, Fort William, N.B.

GREAT YARMOUTH.—March 13.—For Shop-front Alterations, &c., 34 Regent Street. Mr. A. S. Hewitt, Architect, 10 Regent Street, Great Yarmouth.

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HAMPTON.—March 11.—For Purchase and Removal of Twelve Houses. Secretary, Southwark and Vauxhall Water Company, Southwark Bridge Road, S.E.

HARROGATE.—March 9.—For Building Four Villas. Mr. W. H. Beever, Architect, 25 Bond Street, Leeds.

HARROGATE.—March 9.—For Additions to St. Peter's Church Schools. Messrs. Smith & Tweedale, Architects, 12 South Parade, Leeds.

HARROW.—March 8.—For Alterations and Additions to the Greenhill School. Messrs. Houston & Houston, Architects, 13 Furnival's Inn, E.C.

HARWICH.—March 14.—For Erection of Schools, Boundary Walls, &c. Mr. J. W. Start, F.S.I., Cups Chambers, Colchester.

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HEREFORD.—For Additions to Vicarage, Cottage, &c. Mr. W. W. Robinson, Architect, 10 King Street, Hereford.

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HULL.—March 14.—Shops and Houses. Mr. H. W. Ward, Recorder Office, Beverley.

ILFRACOMBE.—March 11.—For Alterations to Christ Church. Mr. W. H. Weir, Architect, 6 Portland Street, Ilfracombe.

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KENDAL.—March 8.—Alterations and Setting Back Premises, &c. Mr. Stephen Shaw, Architect, Kendal.

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LONDONDERRY.—March 15.—For Building County Offices, &c. Mr. David R. Babington, Secretary to the Grand Jury, Shipquay Street, Londonderry.

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NOTTINGHAM.—March 11.—For Building Police Station, Sergeant's House, Mortuary and Reading-room. Mr. Arthur Brown, Borough Engineer, Guildhall, Nottingham.

OLD GRAVEL LANE.—March 8.—For Repairs, &c., at Workhouse and Infirmary. Messrs. Wilson, Son & Aldwinckle, Architects, Vestry Hall, Cable Street, E.

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PENARTH.—March 8.—For Additions, &c., to St. Macburne. Messrs. Habershon & Fawckner, Architects, Pearl Street, Cardiff.

POYNTZPASS.—March 21.—For Renovation of Manse. Mr. Wm. Griffith, Poyntzpass, Ireland.

PRESTON.—March 18.—For Construction of Public Abattoir. The Borough Engineer.

RHYMNEY.—March 19.—For Passenger Station. Mr. G. K. Mills, Secretary, Paddington Station.

ROCHDALE.—March 16.—For Building Seven Houses at Newhey. Messrs. Butterworth & Duncan, Architects, 4 South Parade, Rochdale.

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SOUTHEND.—March 22.—For Erection of Sanatorium Building. Mr. W. Y. Hobbiss, Clarence Road, Southend.

ST. AUSTELL.—March 9.—For Additions to Sydenham Villa. Mr. Silvanus Trevel, Architect, Truro.

ST. LUKE'S.—March 13.—For Erection of Dwarf Wall and Railings. Mr. G. W. Preston, Vestry Hall, City Road.

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TOTTENHAM.—March 12.—For Supply of Stores and Execution of Works. Mr. Edward Crowne, Coombes Croft House, Tottenham.

WAKEFIELD.—March 9.—For Building Four Houses. Mr. Henry Crutchley, Architect, Town Hall Chambers, Wakefield.

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WHITBY.—March 12.—For Building House. Mr. J. J. Milligan, Architect, 77 Baxtergate, Whitby.

WINDERMERE.—March 13.—For Building House. Mr. Robert Walker, Architect, Windermere.

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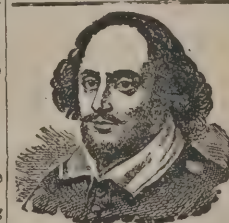
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DARTMOUTH.

For Surface Drainage Works, for the Corporation. Mr. T. O. VEALE, Borough Surveyor. Quantities by Mr. VINCENT CATTERMOLLE BROWN, Paignton.			
W. H. Sanders & Son, Bournemouth	£1,812	0	0
W. C. Shaddock, Plymouth	1,793	0	0
J. Shaddock, Plymouth	1,620	0	0
T. Shaddock, Plymouth	1,542	0	0
J. T. Whetham, Weymouth	1,537	0	0
R. C. Pillar, Dartmouth	1,510	0	0
Ambrose & Welsh, Bath	1,474	0	0
E. Pike, Torquay	1,440	0	0
M. Bridgman, Paignton	1,267	10	0
W. Brenton, Torquay	1,249	0	0

EAST COWES.

For Completion of Well in Brickwork and Cast-iron Cylinders and for Building an Engine-house, for the East Cowes Urban District Council. Messrs. LEMON & BLIZARD, Engineers, Castle Lane, Southampton.			
W. Brown & Son, Tottenham	£1,550	15	0
Tilley & Sons, Walbrook	1,438	8	0
Bull, Northam, Southampton	947	0	0
PLAYFAIR & TOOLE, Northam (accepted)	942	0	0

FARNHAM.

For Rebuilding Mission Hall, Farnham. Mr. ALFRED BRETT, South Street, Bishop Stortford.			
W. Wade, St. Neots	£296	12	0
J. H. Staines, Newport	280	0	0
Glasscock & Son, Bishop Stortford	241	10	0
C. Chapman, Standon	239	0	0
A. Franklin, Bishop Stortford	210	0	0
Bricks, Lime and Sand on the Ground.			

FILEY.

For Pipe Sewers, Manholes, Lampholes, &c., Cast-iron Pipe Outfall to Sea.			
J. Oates, Scarborough	£1,951	0	0
J. Dickson, St. Albans	1,575	7	6
T. Bell, Market Weighton	1,412	9	0
PARKER & SHARP, York (accepted)	1,299	9	10
B. Robinson, Hull	1,295	5	0
J. Sangwin, Hull	1,279	3	5
A. Lyons, Norton Malton	1,244	18	0

GORING.

For Repairs, Coombe End, for Mr. J. Foster, Coombe Park. Mr. J. S. DODD, Architect, Reading.			
Goodall	£531	13	5
For Repairs to Goring Brewery, for Miss A. Pittman, Goring.			
Smallbone	£135	0	0
Brasher	130	0	0
HIGGS (accepted)	119	0	0

HALIFAX.

For Building Vicarage, Savile Park Road, in Connection with St. Jude's. Messrs. HORSFALL & WILLIAMS, Architects, George Street, Halifax.			
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Accepted Tenders.

E. Naylor, Gladstone Road, mason.
A. Holstead & Son, West Parade, joiner.
T. Boocock, George Street, Plumber.

Blackburn & Davenport, Hyde Park Road, slater and plasterer.

HANDSWORTH.

For New Schools at Birchfield, for the School Board.			
J. E. MOORHOUSE (accepted)	£7,499	0	0

HASTINGS.

For Taking-up Old Sewer and Laying About 942 Feet of 9-inch and 40c Feet of 6-inch Glazed Stoneware Pipe Sewers in St. Helen's Crescent, Hastings, for the Corporation. Mr. P. H. PALMER, Borough Engineer.			
D. H. Snow, Hastings	£380	0	0
Barter & Gasson, Hastings	359	0	0
G. Bell, Hastings	325	0	0
J. Gutsell, Hastings	320	0	0
J. & P. Phillips, Hastings	319	10	0
Saunders & Co., Bournemouth	311	0	0
W. PIPER, 38 St. Mary's Road (accepted)	287	13	0

HAVANT.

For New Chapel, Boundary Walls and the Construction of a New Road from the New Entrance Gates of the Cemetery, for the Urban District Council. Mr. A. E. STALLARD, Surveyor.			
J. H. Corke, Southsea	£830	0	0
Rogers, Havant	812	16	9
J. STAPLES, Havant (accepted)	812	3	4

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HAVANT—continued.

- For Building Residence, Waterlooville, for Mr. J. Nash. Mr. A. EDWIN STALLARD, F.S.I., Architect.
W. FIRFIELD, Landport (accepted) . . . £650 0 0
- For Building Residence, Denvilles, Havant, for Mr. C. Kemp. Mr. A. EDWIN STALLARD, F.S.I., Architect.
G. STALLARD, Havant (accepted).
- For Alterations at Havant Workhouse, for the Guardians. Mr. A. EDWIN STALLARD, F.S.I., Architect.
J. STAPLES (accepted).

HEREFORD.

- For Taking-down and Rebuilding Business Premises, 146 and 147 Widemarsh Street, Hereford. Mr. W. W. ROBINSON, Architect, 10 King Street, Hereford.
Beavan & Hodges, Hereford . . . £1,255 0 0
Bowers & Co., Hereford . . . 1,162 0 0
J. DAVIES, Hereford (accepted) . . . 1,160 0 0

KEIGHLEY.

- For Construction of 6,350 Lineal Yards of Earthenware Pipe Sewer, 18 Inches, 15 Inches, 12 Inches and 9 Inches Diameter, with Manholes, Flushing Chambers, Ventilators, &c., together with the Laying-out of about 4 Acres of Land for Intermittent Downward Filtration and Works in Connection with same, for the Keighley Rural District Council. Messrs. BARBER HOPKINSON & CO., Engineers, 6 and 8 Temple Street, Keighley.
H. V. ROBINSON, Keighley (accepted) . . . £5,193 0 0

LEEK.

- For Business Premises, Picton Street, Leek, for the Leek and Moorlands Industrial Provident Society. Messrs. W. SUGDEN & SON, Architects, Leek.

Accepted Tenders.

- H. Hardy, excavator, stonemason, tiler and plasterer . . . £728 0 0
I. Heath, carpenter and joiner . . . 192 0 0
I. Heath, plumber, glazier, painter, gasfitter, &c. 80 0 0

LONDON.

- For Rebuilding No. 93 High Street and No. 1 Paradise Street, Marylebone. Mr. J. RANDALL VINING, Architect and Surveyor, 89 Chancery Lane, W.C.
H. L. HOLLOWAY (accepted) . . . £1,745 0 0

LONDON—continued.

- For Alterations and Additions to a Pair of Cottages, Island Wall, Whitstable, Kent. Mr. J. RANDALL VINING, Architect and Surveyor, 89 Chancery Lane, W.C.
Amos & Foad . . . £164 0 0
J. LAWSON (accepted) . . . 154 10 0
- For Boundary Wall, with Entrance Gates, &c., at the Fountain (Permanent) Hospital Estate, Grove Road, Lower Tooting, S.W., for the Metropolitan Asylums Board.
H. Wall & Co., Kentish Town . . . £3,702 0 0
F. & H. F. Higgs, Loughborough Junction . . . 3,393 0 0
J. Garrett & Son, Clapham . . . 3,101 0 0
G. Godson & Sons, Kilburn . . . 3,100 0 0
W. S. Lorden & Sons, Upper Tooting . . . 2,997 0 0
F. T. Chinchin, Kensal Green . . . 2,900 0 0
P. Peters, Horsham . . . 2,865 5 9
Holloway Bros., Battersea . . . 2,782 0 0
W. JOHNSON & CO, Limited, Wandsworth Common (accepted) . . . 2,770 0 0
- For Pulling-down and Rebuilding about 700 Feet Run of 14-inch Boundary Wall at the Cemetery, Willesden Lane, for the Paddington Burial Board.
Merilion & Emerson, Willesden . . . £809 14 9
C. J. Johnson, Shepherd's Bush . . . 669 7 6
J. Pettipher, Chelsea . . . 650 0 0
W. Hirst, Gracechurch Street White . . . 600 0 0
Buckeridge Bros., Kensington . . . 575 0 0
J. Gibb, West Hampstead . . . 477 0 0
Dainton & Sons, Kilburn . . . 475 10 0
Pluckrose & Son, Kensal . . . 435 0 0
Martin, Paddington . . . 425 0 0
W. Neave & Son . . . 420 0 0
G. Godson & Son, Kilburn . . . 414 0 0
S. Kendall, Paddington . . . 400 0 0
W. A. Prior, Kilburn . . . 393 0 0
Vears & Co. . . . 387 0 0
R. Ballard, Limited, Child's Hill . . . 379 0 0
F. Mark . . . 377 0 0
Spiers & Son, St. John's Wood . . . 370 0 0
Kenney, Upton Park . . . 338 0 0
NEAL (accepted) . . . 321 10 0
Surveyor's estimate . . . 319 0 0
338 0 0

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For Split Oak Fencing, Entrance Gates, Adjacent Walls, Widening of Road, &c., around the Park Hospital Estate, Hither Green, Lewisham, for the Metropolitan Asylums Board.

W. Mills, Westcombe Park	£3,950	0	0
H. Wall & Co., Kentish Town	2,487	0	0
T. Adams, Green Lanes	2,392	5	10
B. Cooke & Son, Battersea	2,297	0	0
Foster & Dicksee, Chelsea	2,266	0	0
S. J. JERRARD & SONS, Lewisham (accepted)	2,194	0	0

MORTIMER.

For Cottage, for Mr. Mearing. Mr. J. S. DODD, Architect, Reading.

Wernham	£412	0	0
Musselwhite	397	0	0
Higgs	345	0	0
Wheeler	329	0	0
MOSDELL (accepted)	317	0	0

NORTH BERWICK.

For Additions, Alterations and Improvements to the existing Sewers in the Burgh, consisting of Cast-iron and Fireclay Piping, Manholes, &c., for the Commissioners. Messrs. BELFRAGE & CARFRAE, Engineers, 1 Erskine Place, Edinburgh.

D. McDonald & Son, Hawick	£1,667	10	9
R. Wallace, Edinburgh	1,646	12	9
L. & W. McDonald, Inverkeithing	1,593	9	2
J. W. & G. Stratton, Edinburgh	1,625	1	3
R. C. Brebner, Edinburgh	1,372	0	0
J. Morris & Son, Edinburgh	1,355	17	9
G. MACKAY & SON, Broughty Ferry (accepted)	1,247	2	11

NOTTINGHAM.

For Drainage of Club-house, for the Committee of the County Club, Nottingham. Mr. R. E. MIDDLETON, Engineer, 17 Victoria Street, London, S.W.

Burn Bros, London	£149	10	0
J. Wheatley	147	7	8
J. Hutchinson	136	9	11
Ball & Son	129	8	6
Morrison & Goodwin, London	128	18	9
Dennett & Ingle	128	0	0
A. G. BELL (accepted)	122	19	2

PAIGNTON.

For Alterations and Additions to the Commercial Hotel, for Mr. R. Moore. Mr. E. RICHARDS, Architect, Torquay. Quantities by Mr. VINCENT CATTERMOLLE BROWN, Paignton.

H. P. Rabbich	£413	0	0
R. Harris	388	10	0
C. & R. E. Drew	352	10	0
H. WEBBER & SONS*	347	0	0

* Accepted with modifications.

RAYLEIGH.

For Building Villa Residence and Stabling at Rayleigh. Mr. JAMES THOMPSON, Architect, Cliff Town Road, Southend-on-Sea.

Baker & Hainsworth, Rayleigh	£5,475	13	6
Kimberley, Banbury	4,139	0	0
Rayner, East Hanningfield	4,100	0	0
Stewart, Southend	4,091	0	0
West, Chelmsford	4,047	0	0
Davis & Leaney, Goudhurst, Kent	4,035	0	0
Badcock & Maxey, Sleaford	4,010	0	0
T. Brown, New Kent Road, S.E.	3,975	0	0
Orfeur, Colchester	3,868	0	0
White & Son, Bow	3,845	0	0
Girling & Coe, Ipswich	3,798	0	0
Berry, Southend	3,791	12	0
Norden, Rochford	3,749	0	0
J. Brown, Grays	3,619	0	0
Gozzett, Maldon	3,450	0	0
Carter, Grays	3,389	0	0

RUSHDEN.

For Building Private Residence, Wellingborough Road, Rushden, for Mr. W. Hewitt, Sen. Mr. H. ADNITT, Architect, Rushden. Quantities by the Architect.

H. Sparrow, Rushden	£1,070	0	0
H. Knight, Rushden	1,050	0	0
Whittington & Tomlin, Rushden	1,030	0	0
R. Marriott, Jun., Rushden	1,025	0	0
T. & C. Berrill, Irchester	1,025	0	0
T. Wilmott, Jun., Rushden	995	0	0
T. SWINDALL, Rushden (accepted)	990	0	0
C. Bayes & Son, Rushden	988	0	0

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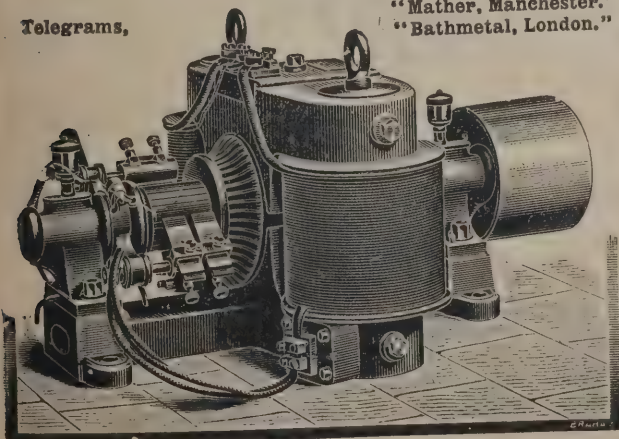
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S. Hipwell	£1,700	0	0
W. S. Freeman	1,700	0	0
W. J. Botterill	1,650	0	0
J. H. Vickers	1,618	0	0
J. F. Price	1,595	0	0
H. Roberts	1,590	0	0
T. Tilley & Sons	1,518	13	0
S. F. Pattinson	1,420	0	0
H. Shardlow	1,390	0	0
J. Pickthall & Son	1,370	0	0
G. H. Williams, Sleaford	1,330	0	0

SOUTHAMPTON.

For Construction of a Pile Foundation and other Works for the Mount-Pleasant School Board, Bevois Valley, Southampton, for the School Board. Mr. JOHN H. BLIZARD, Architect, Lansdown House, Castle Lane, Southampton.

Stevens & Co., Northam	£7,900	0	0
Daysh, Northam	6,980	0	0
A. Payne, Southampton	6,972	0	0
Playfair & Toole, Northam	6,847	0	0
Honeychurch & Co., Bevois Town	6,755	8	0
Crook & Batten, Bevois Town	6,697	7	0
Roe & Grace, Southampton	6,660	0	0
J. Osman, Four Posts Hill	6,584	0	0
H. W. Bull, Northam	6,484	0	0
DYER & SON, Bevois Hill (<i>accepted</i>)	6,400	0	0
Architect's estimate	6,896	0	0

STREATLEY.

For Pair of Semi-detached Cottages, for Mrs. Lee. Mr. J. S. DODD, Architect, Reading.
Smallbone£750 0 0
For Cottage, for Mr. R. Mills. Mr. J. S. DODD, Architect, Reading.
Smallbone£306 0 0
For Alterations and Additions to the Swan, for Mr. G. H. Morrell. Mr. J. S. DODD, Architect, Reading.
Smallbone£579 0 0

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For Warehouse, Prince of Wales Dock, for the Storage of Grain and Other Goods, for the Swansea Harbour Trustees. Mr. A. O. SCHENK, Engineer.

D. C. Jones & Co., Gloucester	£7,321	0	0
J. Wilson, Runcorn	7,000	0	0
J. H. S. Lawton, Neath	6,980	0	0
W. Lissaman, Chipping Campden	6,945	11	3
Dixon Bros., Swansea	6,903	8	0
D. Jenkins, Swansea	6,763	5	0
E. H. Page, Cardiff	6,657	14	10
J. & F. Weaver, Swansea	6,650	11	0
Price & Wills, Westminster	6,533	7	11
W. Williams, Swansea	6,480	4	9
T. Evans, Cardiff	6,464	5	0
G. H. Wilkins, Bristol	6,441	13	5
G. Palmer, Neath	6,318	13	4
T. Richards, Swansea	6,300	0	0
Bennett Bros., Swansea	6,290	5	5
Jones & Thornley, Penarth	6,100	0	0
Gustavus Bros., Swansea	5,892	5	6
T. Watkins & Co., Limited, Swansea	5,869	13	6
G. Davies, Swansea	5,836	13	3
J. Williams, Swansea	5,572	9	9
T. D. RIDLEY, Royal Exchange, Middlesbrough (<i>accepted</i>)	5,474	5	6
G. Jay, Swansea	4,906	0	0

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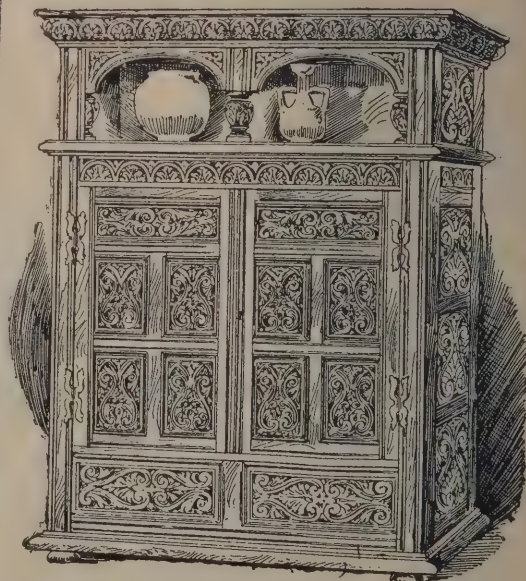
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Accepted Tenders.

E. Moorhouse, Whitehaven, mason and bricklayer.
J. Martindale, Cleator Moor, joiner.
T. Mandle, Maryport, slater.
J. Lawson, Workington, plasterer.
W. Strathern, Whitehaven, plumber, glazier and gasfitter.
E. McConn, Whitehaven, painter and decorator.

WIMBLEDON.

For Building Two Houses, Worple Road, Wimbledon, with Combined Back Drainage. Mr. ROBERT J. THOMSON, Architect, Hill Road, Wimbledon, S.W.

G. Davenport	£2,830	0	0
Holloway Bros.	2,773	9	0
LORDEN & SON, Tooting (accepted)	2,575	15	0

YNSYBWL.

For Enclosing, Forming Road and Footpaths, and Draining Land for a Cemetery at Ynysybw, for the Mountain Ash Urban District Council.

J. Howells, Caerphilly	£1,260	0	0
J. Rees, Ynysybw	1,244	5	8
Barnes, Chaplin & Co., Cardiff	1,131	12	7
Batchelor & Snowden, Cardiff	1,127	0	0
J. Jenkins, Newport	1,132	0	0
WILLIAMS BROS., Cribindee (accepted)	990	15	7

TRADE NOTES.

ADDITIONS having lately been made to the Greenock Academy (Messrs. H. & D. Barclay, Glasgow, architects), the "Climax" continuous exhaust ventilators have been used for the ventilation, and have been supplied by Messrs. Cousland & Mackay, the sole manufacturers, Glasgow.

WE learn that Messrs. E. H. Shorland & Brother, of Manchester, have just supplied some more of their patent Manchester grates to the new Board Schools, Barrow-in-Furness.

IN a note announcing the change of address of Mr. H. T. Owens to 81 Smallbrook Street, Birmingham, we are informed that the special patterns of locks, brassfoundry, &c, as shown

in his catalogues, have been purchased by Messrs. Alfred Brown & Co., lock manufacturers and brassfounders, 81 Smallbrook Street, Birmingham, and therefore all goods specified are to be transferred to them. All orders entrusted to them will receive careful and prompt attention. Messrs. Alfred Brown & Co. keep a large stock of ironmongery of a thoroughly reliable quality, and orders can be supplied quickly.

AT the monthly meeting of the Middlesbrough School Board, the recommendation of the building committee that the tender of Messrs. Bastiman Bros., amounting to 3,732l. 2s., should be accepted for the additions to Denmark Street School, was referred back for consideration. It was decided to obtain a suitable site for a new school, to accommodate 1,300 children, in the district south of the railway and east of Boundary Road.

IT is reported that since the recent severe weather no fewer than 12,230 lead pipes have burst in Liverpool. The consumption of water, owing to taps being left running, has been enormous, the quantity being 57,000,000 gallons in excess of that used in the corresponding period of last year.

IN allusion to the lift accident at Lloyd's, which, unhappily, was fatal in one case, we would call the attention of the public to the fact that Messrs. Easton, Anderson & Goolden, Limited, engineers, London and Erith, have a patented safety attachment that can be applied to any system of hydraulic lift, and which will obviate any accident that might happen through the bursting of any of the pipes, besides preventing the speed of the lift from ever exceeding the given maximum.

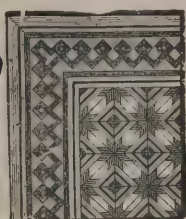
THE *Glasgow Herald* says:—On account of the unwillingness of the original offerers for the digger, mason and brickwork to guarantee the completion of the buildings for the fever hospital at Ruchill within the period of two years, the health committee have resolved to recommend the acceptance of the offer of Messrs. Morrison & Mason, Limited, to do the work, that firm guaranteeing the completion of the hospital within the period stated. The original offer amounted to 101,616l. 14s. 5d., and Messrs. Morrison & Mason's, which was the second lowest, is about 1,101l. higher.

WE have been requested to announce that Mr. Waller, the manager of the Self-Lock Roofing Tile Co., has just been round all the principal towns, with the result that a great number of tiles have been specified by architects, and in many places agencies have been appointed for the sale of tiles and the hiring of machines.

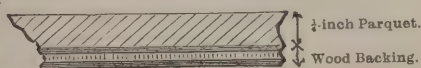
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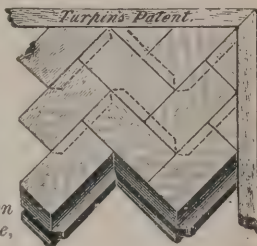
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Section of wood block floors



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ELECTRIC		LIGHTING	
ELECTRIC PUMPING WINDING & TRACTION WORK.	16, GEORGE ST. WESTMINSTER LONDON.		PUBLIC BUILDINGS THEATRES, ETC.
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ILLUSTRATIONS.

MEMORIAL BUILDINGS, RAINHILL, HAYDOCK AND ASHTON-IN-MAKERFIELD, LANCASHIRE.

MILTON ABBEY CHURCH, NEAR BLANDFORD.

VARIETIES.

SOME Manchester capitalists have formed a limited company, called the West Rhyl Land and Building Company, with a capital of 20,000*l.*, for purchasing the Rhyl Winter Gardens and the adjoining lands from the executors of the late Rev. Charles Whitaker. This, together with the new marine lake, will develop the west end of the town in a remarkable degree. A syndicate of Manchester gentlemen have purchased a quantity of land on the Morwylfa estate at Rhyl, on which it is intended to erect a magnificent hydropathic establishment, fitted with every modern convenience. Messrs. Darbyshire & Smith, of Manchester, are the architects, and the contract has been let to Messrs. W. Brown & Sons, of Salford.

AN inquiry has been held at the Town Hall, Yarmouth, relating to the application of the Town Council for sanction to loans amounting to 5,550*l.*, distributed as follows:—For flood prevention, 3,800*l.*; for construction of new road, 800*l.*; latrines on the South Denes, 500*l.*; and public walks and pleasure-grounds, 450*l.*

THE report of the committee of management of the Surveyors and Auctioneers' Clerks' Provident Association states that continued progress has been made during the year ending December 31, 1894. The membership on December 31, 1894, was 142, against 82 at the end of 1889. There has been no special call on the benevolent fund, and while the sick fund receipts have increased the payments have decreased, and the balance to the credit of the fund has increased by 20 per cent. On the life assurance fund there has been no claim since the Association was started. Seven new policies were issued during the year 1894, assuring the sum of 460*l.* The annual general meeting of the members and subscribers was held at the Auction Mart on Wednesday.

THE tender of Mr. Williams, of Sleaford, has been accepted for the construction of waterworks at Hickington, for the Sleaford Rural District Council.

AT the meeting of the Leeds Corporation, it was proposed that a grant of 10,000*l.*, the estimated cost of making alterations and providing additional tank accommodation for dealing with the sewage at Knostrop, should be made.

THE Bolton Town Council have decided to purchase Rhodes Farm, Clifton, the property of the Earl of Derby, at 200*l.* per acre, for the purposes of their sewage treatment scheme. It is estimated that the scheme will involve an expenditure of 75,000*l.*

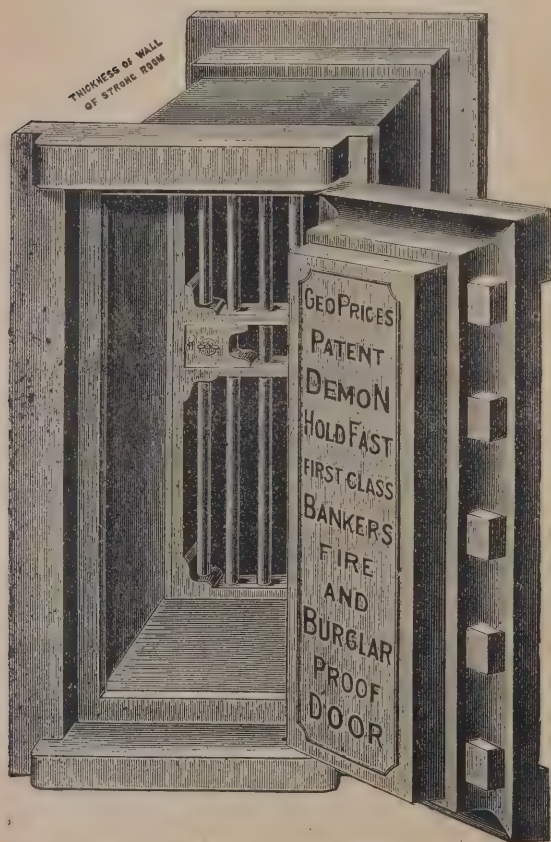
THE sessional meeting of the Sanitary Institute will be held at the Parkes Museum on Wednesday, March 13, at 8 P.M., when a discussion will be opened on "Back-to-Back Houses," by Mr. James Niven, M.B., M.A., medical officer of health, Manchester, with illustrations of various types of back-to-back houses met with in practice, and the methods adopted for dealing with this class of property by Mr. Thomas de Courcy Meade, city surveyor, Manchester.

WE understand that Mr. H. A. Henderson, F.S.I., auctioneer and surveyor, 70 Finsbury Pavement, E.C., has just concluded the sale of a freehold ground-rent of 1,500*l.* per annum, secured by high-class residential flats at South Kensington, facing the Gardens, for the sum of 37,500*l.*

A VERY striking success has, we hear, attended the issue of Messrs. Cassell & Co.'s new serial, "Battles of the Nineteenth Century." Two large editions were sold within four days of publication, and a third edition has been produced.

A DOUBLE number of "The Paris Mode" is published this week, the price being the same as for the ordinary issue, viz. one penny. The editor makes in this number an offer, under specified conditions, of wedding-dresses to those who receive an offer of marriage whilst wearing a dress made from designs appearing in "The Paris Mode." This journal now offers its readers free patterns cut to measurement, free insurance and ree wedding-dresses.

THE *Scotsman* says:—The tenacity of the frost is causing a good deal of difficulty to the Edinburgh water authorities. The city is not in the enjoyment of anything like its normal supply of water, and a staff of no fewer than eighty men is even yet engaged each day in serving out water by means of upstand pipes, water-carts, &c., in the localities where the supply has been frozen up. An enormous amount of damage has been done to the service pipes of the Water Trust. The number of 4-inch pipes that have been burst by the frozen



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water within them is simply without end. In some instances the supply pipe for half a street or terrace has had to be taken up. It has been found that the frost has penetrated the earth to the depth of about 3 feet.

THE *Daily News* Paris correspondent says that the Western Railway Company has presented to the Town Council of that city a scheme for railway communication between the Courcelles girdle station and the exhibition of 1900. It proposes to double the present girdle line between Courcelles and the Trocadéro, where the exhibition railway would branch off, going through Passy and across the Seine by Moulineaux to the Champ-de-Mars. The terminal station there would be greatly enlarged. The estimated cost is 920,000*l*.

WITH a view to induce the construction of a better style of shops and fronts, the directors of the Confectioners and Bakers' Annual Exhibition, which is to be held at the Royal Agricultural Hall, Islington, have decided to give 220*l*. in prizes for specimen shops to be fitted at the hall during the next exhibition, from September 21 to 28.

In the estimates of the Office of Works is included a sum of 1,000*l*. for the partial renewing of the heating apparatus in the palm house, Kew Gardens. The total length of hot-water pipes in the palm house has been estimated at 22,600 feet, or about 4 $\frac{1}{2}$ miles. Notwithstanding, it has always been difficult to maintain a satisfactory temperature in the north wing during winter.

AT the monthly meeting of the Leeds Association of Engineers Mr. Alfred Towler read a paper on "Corliss Valve Gears." The increasing demand for cheap power for manufacturing purposes, the generation of electricity, &c., had again, he said, brought the Corliss engine to the front.

AT the meeting of the Glasgow Association of Students of the Institution of Civil Engineers, Mr. John M. M. Munro, Assoc.M.Inst.C.E., read a paper on "Electric Tramways and District Railways." Commencing with some general remarks on the electrical transmission of energy, he described the application of electricity to the working of tramways and district railways. An interesting account was given of the Carstairs Electric Railway, a short private light railway over a mile and a quarter long, with a gauge of 30 inches, and light permanent way for passenger and general estate traffic between Carstairs Railway Station and Carstairs House, the power being generated by utilising the falls of Cleghorn, and transmitted by rails forming a low fence on each side of the line.

THE Harrogate Town Council have received sanction from the Local Government Board to borrow 5,100*l*. for the purchase of the Crescent estate. Plans have been prepared for laying the estate out as a public recreation-ground.

AT the meeting of the Midland Institute Engineering Society, Birmingham, a paper was read by Mr. Edward C. R. Marks on "Lifting Machinery." After references to several ancient appliances for raising and lowering heavy bodies, particulars were given of modern examples of hand-power lifting machines, including a description of Young's mechanism for automatically sustaining a suspended load. Mr. Marks illustrated typical types of hydraulic lifts and described the system adopted in the construction of inclined or cliff railways.

AT the special meeting of the general committee of the City Improvement Trust of Glasgow it was resolved to have plans prepared with a view to the probable erection of one or more blocks of buildings with houses of one apartment at rents from 4*l*. to 5*l*. and of two apartments at rents from 7*l*. to 8*l*.

THE *Irish Times* says an extensive seam of coal has been reached at the new Dungannon Collieries, at a depth of about 190 yards. Several tons were raised and tested for steam and domestic purposes, and proved to be of excellent quality, and much superior to Scotch coal.

THE Port sanitary and hospital committee of the Liverpool Corporation have received notice of sanction to borrow 26,000*l*. for the extension of the City Hospital North.

THE Birmingham City Council have authorised the technical school committee to expend 14,000*l*. on fitting up the new school in Suffolk Street.

AT the meeting of the Denton Urban Council it was announced that the Scott family intended to present the Lads' Club building and its contents, the engine-room and electrical plant, three cottages in Queen Street, and a plot of land adjoining the Lads' Club, containing an area of about 1,330 square yards to the town. The land was to provide accommodation for the proposed technical school, and toward the cost of this building the family being willing to contribute the sum of 800*l*. The gift in all amounts to about 6,760*l*.

AT the annual meeting of the subscribers to Paisley Infirmary, it was stated that a sum of between 50,000*l*. and 60,000*l*. had been subscribed for the new infirmary buildings.

THE Athens correspondent of the *Standard* says Herr Durm, the German architect, has left on his return to Berlin. His report on the preservation of ancient monuments in Athens

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has been submitted to the Ministry. In it he advises that immediate steps should be taken for the restoration of the rear portion of the Parthenon, and that four raised aqueducts should be constructed to carry off rain water. In regard to the Erechtheum, he recommends the replacement of fallen stones as nearly as possible in their former position. Other classical buildings, in Herr Durm's opinion, do not need to be restored. The Archæological Society of Athens will undertake the necessary works without appealing to the liberality of foreign nations.

THE Theatre Royal at Glasgow has been completely destroyed by fire, and the damage is estimated at about 30,000*l*. A previous Theatre Royal on the same site was burnt down seventeen years ago. The directors have resolved to proceed at once with the rebuilding of the theatre, and they hope to have it open before the end of this year.

A GENERAL meeting of the Sun Life Insurance Society (the seventh under the new constitution and the eighty-sixth since the establishment of the Society) will be held at the chief office, No. 63 Threadneedle Street, on Wednesday, April 3, at 2 P.M., for the purpose of considering the accounts of the Society for the year ending December 31, 1894, to receive the report of the managers and to elect an auditor.

NOTES ON NOVELTIES.

Concealed Casement Stay.—The patent Concealed Casement Stay (Hewitt's patent) is an admirable appliance for use with casements opening either inwards or outwards, and it has the advantage of locking automatically either when closed or open at any angle. Being out of sight anything in the way of unsightly apparatus is absent. Among other advantages it may be of interest to note that for sashes opening outwards the hook supplies a want in furnishing a "pull to." For full length casements opening inwards there is no unsightly projection or sill to trip over. Also, forming part of the sash it can be painted in accordance with the sash, and thereby is always neat and clean, the architectural lines of the casement being also preserved unbroken. There is a distinct merit in regard of the automatic action, which renders the stay particularly desirable and suitable where there are children, as also in many cases being fixed to sashes beyond their reach. Messrs. Nettlefold & Sons, of 45 High Holborn, who supply the patent concealed

casement stay, will be pleased to supply all particulars concerning the same. Their illustrated catalogue of general and builders' ironmongery, containing over 160 pages, will be referred to at length in a subsequent issue.

Sewer-Pipe Joints.—Messrs. J. & M. Craig, of Kilmarnock, are bringing out a new pipe, the rights of which they have purchased from the patentee, Mr. T. Fitzgerald. A most satisfactory test has lately taken place in Dublin in the premises of Messrs. Monsell, Mitchell & Co., 67 to 73 Townsend Street. The method of joining sewer-pipes exemplified in the new invention has been devised to overcome defects in the old system, which resulted not only in considerable trouble and expense to builders, but in many cases involved imperfect drainage and consequent liability on the part of householders to typhoid fever and other dangerous maladies. Messrs. Craig & Co., Kilmarnock, who are now manufacturing pipes with the new joints, have appointed Messrs. Monsell, Mitchell & Co. their sole agents for them in Dublin. The new joints, by an ingenious arrangement, insure in the connected pipes that perfect uniformity of bore which is essential for proper drainage, and the efforts to attain which have hitherto invariably given such trouble to engineers, contractors and others. In addition to this they save a considerable amount of labour, enable the fitting of "gaskin" to be dispensed with and require less than half the amount of cement that is necessary to join pipes in the ordinary way. Mr. D. Baird applied a hydraulic pressure of 100 lbs. to the square inch to the joints without discovering the slightest sign of leakage, and several architects, engineers and contractors examined the joints, and expressed themselves as being pleased beyond all expectations.

CHURCH BUILDING SOCIETY.

THE Incorporated Society for Promoting the Enlargement, Building and Repairing of Churches and Chapels held its usual monthly meeting on February 21, at the Society's house, 7 Dean's Yard, Westminster, the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.:—Building new churches at Barnsley St. Peter, Yorks, 30*l*.; Ellistown in the parishes of Ibstock and Hugglescote, Leicester, 60*l*.; Great Saughall All Saints, in the parish of Shotwick, near Chester, 50*l*.; and Skelmanthorpe, in the parish of Scissett, near Huddersfield, 45*l*. Rebuilding the

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church of St. George, Worcester, 100*l.*; and towards reseating and restoring the church of Holy Cross, Ramsbury, Wiltshire, 50*l.*, in lieu of a former grant of 40*l.* Grants were also made from the Mission Buildings Fund towards building mission churches at Chester, St. Chad, 30*l.*; Dwygyfylchi, St. David, near Penmaenmawr, 50*l.*; and Leigham Court, in the parish of Christ Church, Streatham, Surrey, 25*l.* The following grants were also paid for works completed:—Plaistow, St. Mary, Essex, 250*l.*; Eaton Bray, St. Mary-the-Virgin, near Dunstable, Beds, 30*l.*; Blisland, St. Pratt, near Bodmin, 15*l.*; Leyton, St. Catherine, Essex, 100*l.*; Washington, Durham, 20*l.*; and Plaistow, St. Katharine, Essex, 50*l.*

CITY PRINTING WORKS.

THE fine new printing works of the Geraldine Press, Limited, 21 Whitefriars Street, Fleet Street, E.C., and also the block of offices belonging to *Answers*, Limited, 24 Tudor Street, E.C., formerly lighted by gas, are now lighted throughout by electricity. Mr. E. R. Dolby, Assoc.M.Inst.C.E., of 8 Princes Street, Westminster, acted as consulting engineer for the proprietors. The current is produced in the basement of the works of the Geraldine Press, Limited, by a compound-wound direct-current dynamo, built by Messrs. Crompton & Co, and driven direct by an engine made by Messrs. Belliss & Co., of Birmingham. About 195 lamps have been installed in the works, and about eighty lamps in Tudor Street, and the lighting of both premises is controlled from one switchboard fixed close to the dynamo. The large Hoe machine used for printing *Answers*, and also the Marinoni machines used for printing the large number of other papers published at the same offices are lighted up internally by incandescent lamps which much facilitate work. The wiring of the buildings was carried out by the Electrical and General Engineering Co., of 86 Leadenhall Street, E.C., under the supervision of the consulting engineer.

TESTING MATERIALS.

A LECTURE was delivered by Mr. A. S. E. Ackermann at the meeting of the Civil and Mechanical Engineers Society on "Testing Machines and the Testing of Materials." The lecturer entered fully into the principles governing many of the various

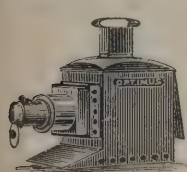
and well-known testing machines, and pointed out the good qualities, faults and difficulties of working with them. Various methods of gripping and holding the specimens to be operated upon were described. This was followed by details being given of the proper method of shaping the specimens, and of measuring and recording the results obtained, and the instruments used for this purpose, particular attention being drawn to several extensometers, particularly those of Professor Unwin. Explanation was given of certain laws that it was well those making tests should bear in mind in working out results. The lecture was illustrated by samples of metals and woods that had been tested; these were kindly lent by the authorities of the City and Guilds of London Institute and Mr. E. H. G. Brewster, who lent samples of steel boiler plates that had been tested by him in connection with boilers of his design. The peculiarities exhibited by some of the metals were very marked, and were prominently brought to the notice of those present. The necessity for testing materials was fully brought out in a discussion which took place towards the close of the meeting, at the invitation of the lecturer.

PUBLIC WORKS IN THE CITY.

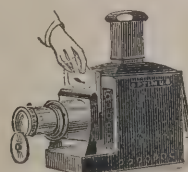
THE engineer to the City Commission of Sewers, Mr. D. J. Ross, has presented to that body a report on the works executed in his department last year. He states that 387 houses were drained and 127 dangerous structures reported upon and completed. The frontages of a number of houses in various streets were set back with a view to widening the thoroughfares. The whole of the premises on the south side of St. Paul's Churchyard, lying between Dean's Court and Paul's Chain and extending back to Carter Lane, being about to be rebuilt, lines of frontage were arranged. Dean's Court was to be widened from 10 feet to 22 feet. Memorials were sent to the Commission urging the completion of the widening of Lower Thames Street and the approaches to Billingsgate Market. Plans were prepared showing the properties required to be taken between St. Paul's Station and Tower Hill to make the thoroughfare 35 feet and 40 feet wide respectively. These were submitted to the London County Council, who agreed to contribute one-third of the net cost of the improvement at the west end of Upper Thames Street provided the Commission would undertake the portion of the proposed northern approach to the

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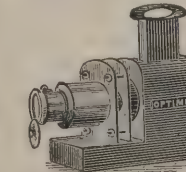
Each Magic Lantern is efficient for exhibitions. The Lens gives crisp definition, being a superior Achromatic Photographic Combination with rack and pinion. It is fitted to a telescopic lengthening tube, so gaining increased focal accommodation. The Condenser is composed of two plano-convex lens of 4 inches diameter. The refulgent lamp has 3 wicks, yielding a brilliantly illuminated picture. Each is complete in box. Pairs for dissolving arranged in one Box at same prices. Lever Disolter, 8s. 9d.



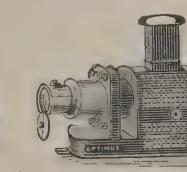
Superior Japanned Metal Body, 30s.



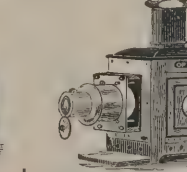
Student's Lantern (to take demonstrating tank) with Brass Sliding Tubes, 40s.



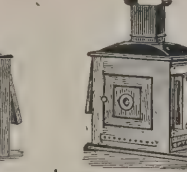
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Perforated Russian Iron Body, Brass Sliding Tubes, 50s.



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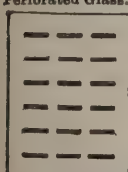
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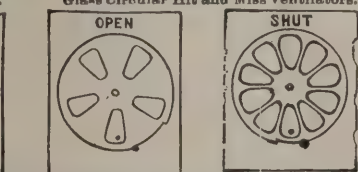
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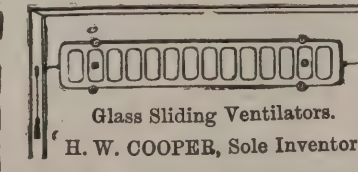
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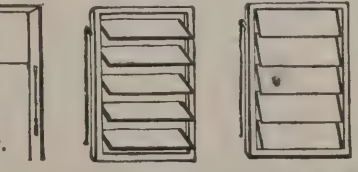
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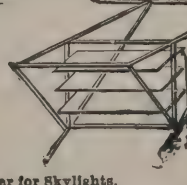
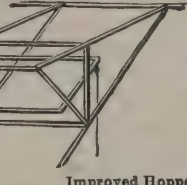
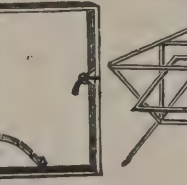
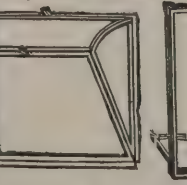


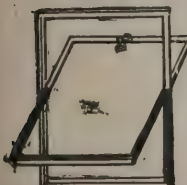


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Tower Bridge within the City, towards the cost of which portion the County Council were prepared to contribute one-half. The question of making an improvement at the western end of Cheapside had also, with three alternative lines, been submitted to the County Council, but no result had yet been arrived at. The widening of Milton Street had been abandoned, the compensation demanded being excessive. Negotiations were in progress for widening the entrance to Wood Street from Cheapside. The number of defective gas-lights observed during the year was 113. The full contract quantity of gas had been given generally throughout the City and the regulators kept in proper condition. Both the gas-lamps and the electric lights were used during the six days of fog in the year. The electric lighting of the City was continued throughout the year. There were now 483 arc lamps in use. The total length of main thoroughfares lighted by arc lamps was about 13 miles. The number of gas-lamps discontinued was 1,338. The cost of water for flushing streets, sewers, &c, had been 3,261/. The street cleansing had gone on as hitherto. No fewer than 1,186,000 people and 92,000 vehicles entered the City daily, and 301,000 persons passed the entire day at work within the City—numbers which were not equalled, or even approached, by any other city in the world. The quantity of refuse removed had been 72,782 van loads, or about 233 per day. The usual arrangements had been made to meet the emergency of a heavy fall of snow. The number of interments during the year at the City Cemetery at Ilford was 4,875. All the rooms and shops at the artisans' dwellings, Petticoat Square, had been let, and the artesian well furnished an ample and continuous supply of water.

ELECTRIC EXPLOSIONS.

THE following letter has been addressed by the Board of Trade to the Chairman of the electric-lighting committee of the St. Pancras Vestry:—

Board of Trade (Railway Department), 7 Whitehall Gardens, London, S.W.: February 28, 1895.

Sir,—Adverting to the interview which you were good enough to give me yesterday, and to the conversation which we had on the subject, I am directed by the Board of Trade to state, for the information of the electric-lighting committee of the St. Pancras Vestry, that Major Cardew, the electrical adviser of this Department, has discovered, in his investiga-

tions into the recent explosions in the street boxes used for electrical supply in St. Pancras, that a remarkable deposit on some of the insulators contained a considerable quantity of the metal sodium.

The presence of this metal, which is highly inflammable by contact with water, appears to be so grave a source of danger and to afford so reasonable an explanation, in connection with the accumulation of escaped coal gas, of the several explosions which have recently occurred, that it devolves upon the Board of Trade, without any delay whatever, to investigate the causes of the deposit of this substance, with a view to its prevention, and in this investigation they have asked for the assistance of the Royal Society and of the Institution of Electrical Engineers.

In the meantime, in order to prevent as far as possible the recurrence of similar explosions, the Board of Trade would strongly urge that the vestry, through their electrical committee, should immediately:—

1. Provide a thorough system of ventilation for their conduits and street boxes.

2. Reduce as far as possible the space in their street boxes within which an accumulation of gas can occur.

3. Make a thorough inspection of their mains, and remove the above-mentioned deposit wherever it is found to exist.

As regards the means to be taken for prevention of the recurrence of such deposit, the Board of Trade hope to be able to communicate with you further without delay.—I am, &c.,

COURTENAY BOYLE.

The following reply was sent to the Board of Trade:—

Electricity and Public Lighting Department, St. Pancras Vestry Hall, London, N.W.: March 1, 1895.

Sir,—A special meeting of the electricity committee was held last evening, when the Chairman reported the conference held at your offices on Wednesday last on the subject of the recent explosions, and your letter of the 28th ult. was considered.

I was instructed to inform you that the committee desire to record appreciation of the courtesy shown by you in the desire to assist the vestry, and are thoroughly in accord with the Board of Trade in their desire to prevent a recurrence of the explosions that have recently taken place.

With regard to the several recommendations contained in your letter, the committee have instructed their engineer to have fixed, without delay, ventilating pipes for getting rid of



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any accumulation of gas in the manholes and culverts; and, pending further consideration respecting reducing the size of the manholes, to fill them up as far as practicable with bricks. Extra men have also been engaged inspecting the mains and removing whatever deposit may be found on them.

The committee note the Board of Trade have asked the Royal Society and Institution of Electrical Engineers to investigate into the causes of the deposit of the metal sodium, and that the Board will inform the vestry of the result of such investigation.

The committee also expressed a hope that the Board of Trade would bring pressure to bear on the gas company to remedy the defective state of gas mains and services in this district, and thus remove the primary cause of the explosions.—
I am, &c., A. E. PYCRAFT.

Sir Courtenay Boyle, Board of Trade.

THE CARDIFF IMBROGLIO.

THE following additional correspondence has passed between Mr. Seward and Mr. Bruce-Vaughan respecting the museum:—

Queen's Chambers, Cardiff:

March 1, 1895.

My dear Vaughan,—Your reply to my letter is only a repetition of the inconsistent suggestion that I should discuss my business affairs with gentlemen who are concerned in an attempt to deprive me of an honourably-acquired engagement. The incident which first disclosed this attempt was my being pressed to sign a certain requisition, already signed by a majority of Cardiff architects, to the purport of which the names of many others were afterwards attached without their sanction or knowledge. This requisition (it was urged) was merely intended to raise the question of the borough engineer's connection with architects' work, but I paused long enough to discover that the document not only made no reference whatever to that gentleman or his work, but that it related solely to the museum building, which I was perfectly well known to be connected with as architect. In the present instance I will pause again—sufficiently to await the issue of that just and right consideration which the authorities will certainly extend towards one who has acted diligently for them in respect to the Cardiff Museum and Art Gallery. I can now, however, appropriately quote from my letter to our honorary secretary, sent for presentation five weeks ago at

your "architects' memorial" meeting, but not read there, viz. —"I hope, for the credit of the local profession, that this matter will be dealt with very judiciously. It contains opportunities for displaying ill-will of a small kind, as well as some possibilities for permanent and unprofitable discord. But it can also call out a proper spirit of fairness and justice." It could—but did not. I alluded last week to my business being harassed. This was no mere figure of speech. For some time past individual acts of very unprofessional interference between myself and clients, whose confidence had been earned, have been forced on my attention. These, when taken together with the present action, convince me that the Cardiff Architects' Society is not the body of men to redress them. Finally, any discussion of details of the museum matter must, as far as I am concerned, remain with the parties rightly affected, viz. the authorities and myself—Yours very faithfully,

(Signed)

EDWIN SEWARD.

E. M. Bruce-Vaughan, Esq., Cardiff.

Cardiff: March 2, 1895.

My dear Seward,—I was very much surprised this evening to see the letter I received from you yesterday printed in this evening's *Express*, and the more so because I had not even replied to it. But you appear to me to be too anxious to give publicity to what I consider at this moment a purely personal matter, and of little or no public interest. The letter which I received on the 21st inst. (the day of our annual dinner) was also in the hands of the press before I had replied to it, and as no one had read that letter but myself it was quite clear to me that you had given copies of it to the press, and sent their representatives to interview me on this subject. In your letter of January 21 last, and again in this letter of the 1st inst., you make what amount to two distinct and grave charges against our Society, which if proved would stamp the conduct of those present at the memorial meeting as dishonourable and unprofessional. First, you say "that we have influenced the authorities to such an extent as to cause you to be deprived of the position of architect to the Cardiff Museum and Art Gallery;" and again, that the method we have adopted constitutes an unworthy departure from those right lines of professional courtesy and fairness which we claimed to uphold when forming our Society. But what are the facts? It came to the knowledge of some of the members of the Society that it was the intention of the museum committee to advise the Corporation to advertise for designs in competition for the proposed new museum and art gallery on the Park Place site, and a requisition was

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sent to the hon. secretary requesting him to convene a special meeting to consider the advisability of limiting the competition to architects practising in the county borough of Cardiff. At this meeting your letter of January 21 was read by me, and the points of importance in it, which I quote—"the museum work is in my hands"—"I have grounds for a strong legal claim, which will be held to if the Corporation should be induced to ultimately deal unfairly with me"—were emphasised by me as strongly as possible. But, on the other hand, it transpired that there was a desire in the minds of some of the members of the museum committee to advertise this work in competition, and Mr. Edwin Corbett read the following letter from the vice-chairman of this committee:—

38 Charles Street: January 24, 1895.

Dear Corbett,—The museum building committee was only appointed last week, and, so far, has not even been called together, much less appointed an architect; they cannot, therefore, be pledged to anyone. My own opinion is that plans will be advertised for in the usual way.—Yours very truly,

C. T. VACHELL.

It appeared quite clear from this letter and other information which was given to the meeting and to myself personally that several members of this committee were firm in their opinion that you had no claim, legal or moral, to the position of architect to the proposed building in Park Place, and that it was the intention of the committee to advertise, to use the vice-chairman's expression, for plans in the usual way. With these facts before us, Mr. Edwin Corbett proposed and Mr. C. B. Fowler seconded the following resolution:—"That the Cardiff, South Wales and Monmouthshire Architects' Society memorialise the Cardiff Museum committee to the following effect:—That unless they have already pledged themselves to any architect, they should invite a public competition for designs for the new museum buildings proposed to be erected in Park Place, the competition to be under the rules of the Royal Institute of British Architects." An amendment was proposed by Mr. G. E. Halliday and seconded by Mr. H. Budgeon, to the same effect, but suggesting that the competition be confined to Cardiff architects, but the resolution was carried. It was also proposed by Mr. Chotton James and seconded by Mr. E. H. Bruton, that the printed list of members be sent with the resolution. The printed list not having been corrected for the year, a type-written list was sent with the memorial to the town clerk. An account of this meeting, with the names of the members who composed it, appeared in the papers the next morning.

This appears to me to be a fair statement of our conduct as a Society in this matter, and the very head and front of our offending hath this extent—no more; and don't you think that some people may consider that, to quote your own words, "you have departed from the right lines of professional courtesy and fairness which we claimed to uphold when forming our Society?" And for these reasons:—Your refusal to give us the grounds of your claim to the position of architect to the proposed building in Park Place, and, with your knowledge of the contents of Dr. Vachell's letter, still refusing, at my invitation, to meet the members of the Society to discuss this question—not in public, but in the proper place—a duly convened meeting; by asserting that we have influenced the Corporation to deprive you of this work, and by publishing such a base, unworthy and groundless charge in the press; by confusing the issue between yourself and the Society; by introducing in your last letter a complaint against the acts of private individuals without naming them, and further, by insinuating that by sending a printed list of members of the Society with the memorial that we wished it to appear that those gentlemen who were not present at the memorial meeting had signed the memorial.

It is well known to the members of our Society that you designed the present museum buildings in Working Street, and in preparing plans for the extension of the free library, now nearing completion, an extension of accommodation for the museum was contemplated but abandoned, and it is also well known that in addition to your services professionally you have given honorarily, as a member of the museum committee, valuable assistance and advice on the work of that committee. And these facts alone, without other information, would constitute a sufficient ground for myself, as an architect, to abstain from any interference with you in your claim to act as architect to the new museum and art gallery in Park Place; and moreover if you can prove to myself and the Society that you have either a legal or moral claim to this position I can assure you, as its President, that we will support you by every means in our power and in any manner you may suggest.

In conclusion, as a friend of yours, and in the interest of the profession in the town, I again repeat the suggestion contained in my short note of the 22nd ult., that I will call a meeting to discuss the question if you will promise to be present, and, in offering the suggestion again, I may state that we do not wish to discuss your "business affairs," but to know the ground of your claim to hold the position of architect to the



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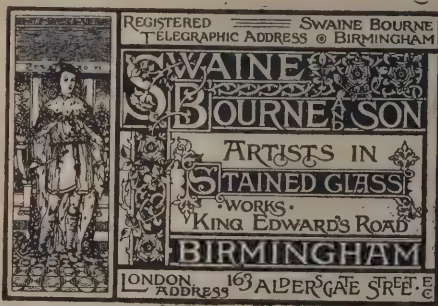
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proposed museum in Park Place, which Dr. Vachell so distinctly denies. If a good one, I am certain that the Society will support you in it, for there is no desire to deprive you of what you consider "an honourably acquired engagement."—Believe me, very faithfully yours,

(Signed) F. M. BRUCE-VAUGHAN.

Edwin Seward, Esq., Cardiff.

FUTURE OF PLUMBERWORK.

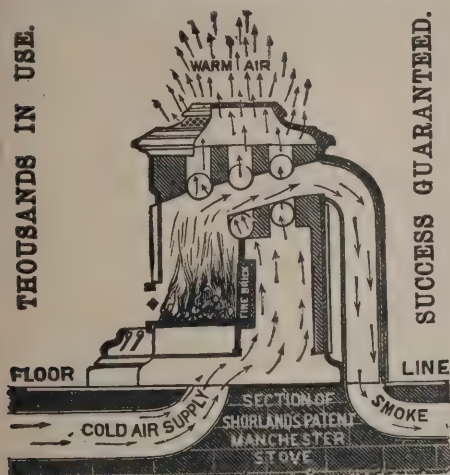
ON this subject Mr. Peter Fyfe, sanitary inspector for Glasgow, delivered a lecture in the Waterloo Rooms. Ex-Bailie Crawford presided, and there were present Mr. John Gordon, I.A.; Councillors John King, Brechin and Dunn; Messrs. James Anderson (president), William Fyfe (vice-president), Robert Campbell (treasurer) and J. T. Renfrew (secretary), Master Plumbers' Association; Archibald Craig, secretary of the District Council, &c.

The Chairman having briefly introduced the lecturer, Mr. Fyfe began his address by a reference to the responsible nature of the duties the practical plumber had to perform. He found, he said, that in greater Glasgow there were 239 master plumbers, employing 1,151 journeymen and 239 apprentices. Of the masters 115 undertook steam and hot-water heating, 124 confined themselves to plumbing pure and simple, and 200 were prepared to assist in the distribution of water in the city at a pressure of 1,000 lbs. to the square inch. All recognised the fact that since the plumber came to add the extraction of sewage from the home to his first duty of supplying pure water, he jumped from being a tradesman yielding comfort and convenience into the position of a health protector or a health destroyer. He knew from experience in his official position that lives were yearly undermined and cut off through inefficient workmanship in pipes and drains. They would therefore all agree with him that no individual should be entrusted with the conception and construction of work who could not give evidence of a full knowledge of its principles and practice. Therefore the necessity for a State-protected register of the men who were accounted fit to fulfil the law. Not till then would the modern plumber be regarded as the trusted friend of every household instead of its deadly and most troublesome foe. Mr. Fyfe afterwards spoke of the possibility of the introduction of more rational methods of obtaining heat and power in large cities, predicting that in 1945 Glasgow would warm herself, cook her

food, and drive her motors by very different methods than those employed just now, and in these, he was convinced, the future plumber should have a predominant share. In New York in 1882 works were established to supply steam at a pressure of 80 lbs. per square inch to the citizens from central stations. Two main stations had been erected by the New York Steam Company capable of supplying high-pressure steam up to 19,000 horse-power per hour. The main wrought-iron pipes from these stations extended through nearly eight miles of streets, yielding power to between 500 and 600 steam-engines, but principally heat to public and private buildings. For a continuous supply of one indicated horse-power per hour a charge of about 3d. per hour was made, which for a working period of 3,000 hours during the year amounted to 9l. 7s. 6d. Small users paid more, viz. 12l. 10s. and large users paid less, or 7l. 10s. In Glasgow these charges would be greatly reduced, as both our fuel and our labour are much cheaper. Coming to the cost of heating, he found the charge was about 9s. 6d. for each 1,000 cubic feet of space heated during 182 days of the cold season at 24 hours per day. He estimated that at two-thirds of this cost the same thing could be made to pay handsomely in Glasgow. In connection with our refuse despatch works, the cleansing committee consumed in the furnaces of the destructors 94 tons of what was technically known as "soft core." He had found by experiment that the committee were in this way parting with a commodity they might be able to sell in the form of steam for 14l. 12s. 6d. nightly, or per annum of 3,000 working hours for 4,387l. 10s. Out of this sum which might be obtained for the steam, what might be termed the pure loss was its equivalents in coal at 7s. a ton, which amounted to 1,213l. 12s. 6d. per annum, and the fireman's wages, which of course were at present lost. The power of these furnaces, if utilised with suitable machinery, was capable of supplying 562 arc lamps of 2,000-candle-power, which would light on the low-tension system 19 miles of streets. He considered further that the Corporation were in quite an exceptionally good position for trying the power and usefulness of steam for heating and cooking in a few selected buildings near to any of their works, either in tenements belonging to themselves or by special arrangement in the property of private proprietors. Mr. Fyfe then proceeded to describe a system in operation in Paris for the transmission of compressed air from central stations, and showed its sanitary advantages as a motive power in factories, workshops and shops.

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The thanks of the meeting were given to Mr. Fyfe for his lecture.

In the course of the evening the Chairman, on behalf of the Worshipful Company of Plumbers, presented to each of Messrs. Francis M'Culloch, Robert Hunter, William Cunningham, and A. F. Whyte the bronze medal of the company for distinction gained in the department of plumbing exhibits at the National Workman's Exhibition held in London in 1893. The medal has been recently struck from the design of Mr. W. D. Caroe, and has been engraved by the celebrated medallist Mr. Allan Wyon. It is intended to mark in a special manner the company's sense of the supreme importance of maintaining a high standard of handicraft, skill and excellence of workmanship.

EDINBURGH SANITARY PROTECTION ASSOCIATION.

THE annual public meeting in connection with this Association was held in Edinburgh, Professor Sir Douglas Maclagan presiding. The secretary, Colonel Noble, read the eighteenth annual report, which stated that the Council had much satisfaction in being again able to point to such useful work during the past year. It was with regret that they had to record the recent death of Sir James Stewart Richardson, Bart., of Pitfour, one of their vice-presidents. The fact that forty-six persons had since January 1, 1894, become annual subscribers in Edinburgh and Leith, whilst only twenty-one signified their wish to withdraw, sufficiently indicated the growing confidence entertained by the public in the usefulness of the Association. Notwithstanding certain statements that had recently been made in the press and elsewhere, tending to show that the arrangement of the usual domestic sanitary appliances advocated by this and similar Associations was incompatible with their efficient protection from the action of frost in severe weather, the Council were distinctly of opinion that where the internal fittings and work generally were in good order, no greater difficulty should be experienced in keeping such appliances in efficient operation during periods of frost, when arranged in accordance with sanitary requirements, than when that arrangement was otherwise. It was the intention of the Council shortly to reprint and reissue a pamphlet explanatory of the precautions that should be taken in order to maintain domestic sanitary systems in efficient working order during frost.

THE LATE JOHN POWELL.

INDUSTRIAL art has sustained a heavy loss by the death which took place on Saturday at Blackheath, near London, of Mr. John Hardman Powell, the artistic head of the eminent Mediaeval firm of Hardman & Co., of Newhall Hill, Birmingham. Mr. Powell, who had been in failing health for some time past, was attacked by influenza about a week ago, and pneumonia supervening, he succumbed to the disease on Saturday last, the eve of his sixty-eighth birthday. According to the *Birmingham Post*, Mr. Powell was born in Birmingham on March 4, 1827. His father was William Powell, a well-known local brassfounder, who married Lucy, the daughter of John Hardman, the founder of the firm of Hardman & Co. John Powell early showed signs of artistic talent, and was placed with Mr. George Elkington, founder of the firm which bears his name, in order to learn modelling. His apprenticeship to modern art, however, was destined to be brief. About that time his uncle, John Hardman, was commencing the revival of Mediaeval art, both in metal-work and stained-glass, in conjunction with Augustus Welby Pugin, and he shortly afterwards removed his nephew to Ramsgate, where Mr. Pugin had his studio. Young Powell soon caught up with enthusiasm the spirit and traditions of his master's art, and rapidly became his right hand in all that related to design and drawing. Probably the happiest years of Mr. Powell's life were those spent in the Ramsgate studio. In 1850 he married Mr. Pugin's eldest daughter, Anne, who survives him. When Pugin died, in 1852, John Powell returned to Birmingham, and was shortly afterwards taken into partnership, together with his brothers William and James (the former of whom still survives), by their uncle, Mr. Hardman, and the firm then became known as John Hardman & Co., the title which it still retains.

Mr. Powell threw himself with energy and enthusiasm into his work, surrounding himself with a staff of congenial artists and students, and labouring often till a late hour of the night on the designs and compositions for which the firm had become celebrated. There are few churches or cathedrals in the country in which some examples of his art are not enshrined, and among those with which he was especially identified may be mentioned the west windows of Worcester Cathedral, and St. Martin's, Birmingham; the beautiful window in St. Chad's Cathedral, to the memory of the late John Hardman; and more recently the windows of the noble

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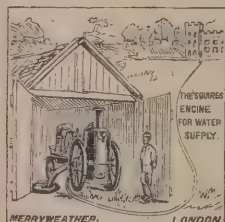
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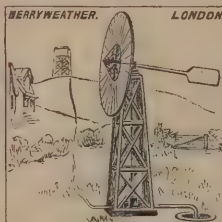
The "Times" says:—"A Practical Pamphlet."



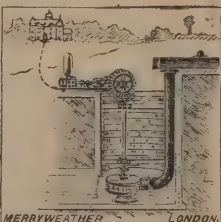
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church lately erected by the Duke of Norfolk at Norwich. Mr. Powell was no less happy in metal-work than in glass, and many of the choicest productions of the firm in grilles, rood-screens and altar-plate were from the designs of the deceased artist partner. Of late years, however, Mr. Powell's work had been practically confined to window-designing, owing to the separation of the metal and glass departments, and the establishment of a distinct firm for the carrying on of the former branch. Whilst deeply penetrated with the spirit of his master, the great Gothic revivalist, Mr. Powell was not wanting in the creative faculty, and his conceptions generally, whilst conforming to the canons of Mediæval art, exhibited a fancy and character which were all his own. He had a lofty ideal of the dignity of art, put his best work into everything he touched, and persistently refused to lower his standard to anything that was mean or false or *ad captandum*. Mr. Powell was fortunate in drawing around him a group of congenial workers who were quick to imbibe and carry out his ideas, and among them may be mentioned Mr. W. J. Wainwright (who has since achieved so eminent a position in another field of art), Mr. G. B. Maycock, and Mr. Dunstan Powell (the eldest son of the deceased). The two last-named artists, we may observe, are responsible for most of the more recent designs of the firm, with which they remain. Mr. Powell's modesty, amiability and charm of manner were on a par with his artistic qualities. He was naturally of a retiring disposition, and took no part in public life beyond delivering a few lectures at different periods to the students of the Birmingham School of Art, an institution in which he always took the warmest interest. Mr. Powell was not a prolific writer, but some of his lectures which have been published, and the paper on "Mediæval Art" which he contributed to the volume on the "Industrial History of Birmingham and District," prepared by Mr. Sam Timmins in connection with the visit of the British Association in 1865, gave evidence of diligent study, shrewd critical observation and considerable literary skill. A few years ago Mr. Powell left Birmingham to take up his residence at Blackheath, in order to superintend the London branch of the firm, situated in King William Street, Strand, whilst his partners, Mr. William Powell and Mr. John Hardman, continued to reside in Birmingham. Mr. Powell leaves three sons and seven daughters, several of whom are married. His remains were buried on Wednesday last at Ramsgate, near to his beloved master and father-in-law, Augustus Welby Pugin.

CIVIL AND MECHANICAL ENGINEERS.

THE above Society visited the works of the New City of London Brewery in Upper Thames Street, E.C., and the works of the Waterloo and City Railway now in course of construction. The members were conducted over the brewery by the company's brewer, Mr. J. B. Kibble, and their engineer, Mr. W. T. Harris. The brewery is an old-established one, and contains a large amount of machinery of considerable interest to engineers. The better part of the old machinery has been kept, and this is combined with modern machinery and apparatus. The members first inspected the pumping-engine and well. The latter, owing to the continual lowering of the water level under London (which is at the rate of one foot a year in the neighbourhood of this brewery), has been deepened and altered considerably since it was first sunk, the particulars of which were clearly pointed out by Mr. Harris by the aid of drawings showing various sections of the well and the strata through which it passed. Those present were then shown by Mr. Kibble the whole of the brewing process, from the taking in of the grain to its final sampling. They were shown the separator for the extraction of nails, dust, &c., from the grain; the malt-crushing rolls, the modern converter, a new and very interesting machine which is capable of dealing with 70 quarters of malt at one operation, and requiring 25 horse-power to work it. From the converter the members were taken to the mash tun-room, to the coppers, to the hop store constructed about 1825, the floor of which is supported by means of wrought-iron slings from the roof. The party then passed to the cooling-room, the fermenting-room, the yeast-room, the yeast coolers and presses, and finally to the racking-room, where the members were shown, among other things, an excellent barrel-lift of Mr. Harris's design. A hearty vote of thanks was accorded Mr. Kibble, who had been most courteous in his reception of the members, and to Mr. Harris, after which the party proceeded to the Waterloo and City Railway works, over which they were shown, in the absence of Mr. Hay, the resident engineer, by Mr. Knowles, the contractors' engineer, who explained in detail the work that was being done and the method of carrying it out. The length already completed of one of the tunnels, there being two, is a quarter of a mile, and their diameter is 13 feet each. Mr. W. R. Galbraith and Mr. J. H. Greathead are the engineers to the scheme, and Messrs. J. Mowlem & Co. are the contractors. The machinery used is of

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modern date, the works are lighted by electricity both above and below ground, and an electrically driven locomotive conveys the spoil from the face of the heading to the central shaft, where it is raised and deposited into barges alongside. The shaft, which is in the river, enables the work to be carried on without disturbing in any way the thoroughfares under which the railway burrows, and further, there is a considerable saving in the cost of construction by this method of working. Mr. Knowles having been thanked the members dispersed.

A BUILDER'S ACCOUNT.

AT the Skipton County Court Mr. Edmund Ridley, Q.C., sat as official referee to hear an action in which the plaintiff was Mr. Oswald Lister, contractor, of Ilkley, and the defendant was Mr. James Lambert, of Ilkley, and of Glen Cottage, Skyrethornes, in Upper Wharfedale. The original writ was for the sum of 836*l.*, and was in respect to contracts in the building of Glen Cottage, Skyrethornes, of which property the defendant was owner. The sum of 278*l.* had been paid into court, leaving a balance of 558*l.*, which was now sued for. The defence set up was that the work at Glen Cottage, Skyrethornes, had not been properly completed, that the work done had been carelessly and negligently done, that excessive charges had been made, and that the work had extended over an unreasonable time, namely, from 1892 to 1894. The plaintiff stated that before the work was fairly completed he and Mr. Lambert had some words, and he (plaintiff) was dismissed from the job. The quarrel was with respect to the getting and dressing of stone, &c. Plaintiff estimated the uncompleted work to amount to about 34*l.* There had been a large number of contracts, estimates having been given at different periods from 1892 to 1894. In the autumn of last year plaintiff had made application to defendant to have a settling up, and refused to give Mr. Lambert an estimate for other work because a settlement had not been effected. In cross-examination it was endeavoured to prove discrepancies in the several contracts and in the time-sheets of the plaintiff's men. The Official Referee remarked:—Because plaintiff did his business well you wish to quarrel with him. He has done his business very well. Counsel further complained of Mr. Lister's extravagant charges with respect to drainage, &c., whereupon the Official Referee remarked that the defendant had agreed to such and such charges in the con-

tracts, and he must now stand by them. The Official Referee was afterwards informed that a consultation had been held, and that counsel had agreed as to an order, which was to [the effect that the defendant should pay the sum of 450*l.*, in addition to the 278*l.* paid into court, and costs. The Official Referee agreed to this course.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

3474. Alfred Jones, for "Improvements in waste plugs for lavatories, sinks, baths and other purposes."
 3483. Frederick Lettice, for "Improvements in and relating to disinfecting apparatus for use in connection with drains, gullies, sinks and the like."
 3555. Lascelles Wood, for "Improved sanitary joint for tubes or piping."
 3561. Johannes Franz Kleine, for "Improvements in fire and damp-proof ceilings and walls."
 3611. Charles Talmage Bastand, for "Improvements connected with window-sashes."
 3669. Percy Richard Julius Willis, for "Improvements relating to windows."
 3677. Johannes Ehrcke, for "Improved means for rendering doors and windows draught-tight."
 3784. Andrew Cashin, for "Improvements in lift-up rim locks and latches for doors."
 3801. Mervyn Hardy Wrigley, for "An improved window-fastener."
 3896. Andrew Murray and Thomas Cochrane Highet, for "Improvements in and relating to sash-windows."

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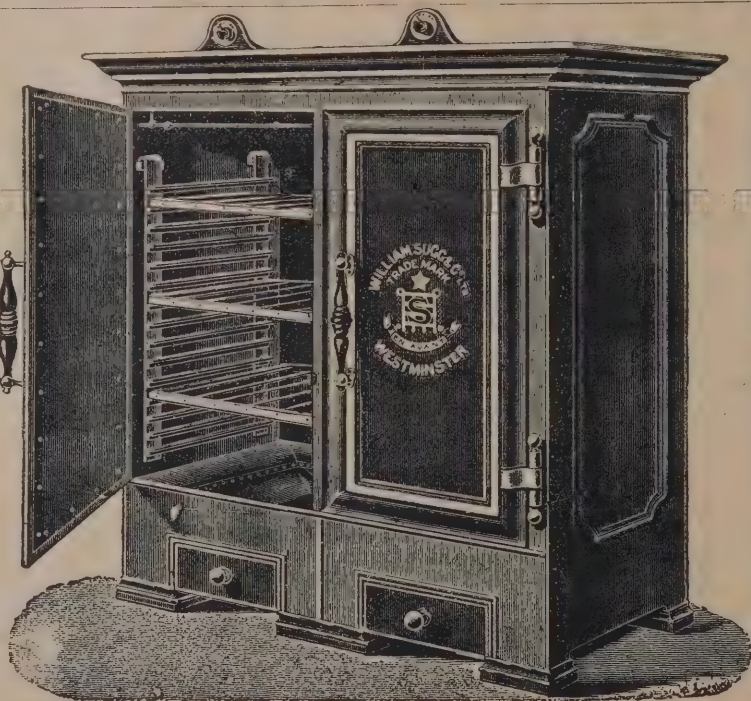
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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

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ABERDEEN.—March 19.—For Additions to the Daviot Branch Asylum. Messrs. W. & J. Smith & Kelly, Architects, 170 Union Street, Aberdeen.

ARMLEY.—March 19.—For Additions to Boot Factory. Mr. C. F. Wilkinson, Architect, 35 Park Square, Leeds.

ATTERCLIFFE.—For Building Three Houses. Mr. J. P. Earle, Architect, Norfolk Row, Sheffield.

BIRMINGHAM.—March 21.—For Building Stabling, &c. Mr. Wm. S. Till, City Surveyor, Council House, Birmingham.

BLACKBURN.—March 29.—For Extension of Church Higher Grade Schools. Messrs. Stones & Gradwell, Architects, 10 Richmond Terrace, Blackburn.

BLANDFORD.—March 26.—For Erection of a New Chancel and Organ Chamber for Blandford Church. Mr. Chas. Hunt, Architect, Blandford.

BRADFORD.—For Building Mill Chimney. Mr. George Ogden, Architect, Bradford.

BRIDGWORTH.—March 25.—For Erection of an Infirmary. Mr. E. C. H. Maidman, 1 Comely Park Avenue, Edinburgh.

BUDDON, FORFARSHIRE.—March 29.—For Erection of Firing Battery, Latrines and Magazine. Director of Works Department, Admiralty, 21 Craven Street, W.C.

BUILTH.—March 28.—For Iron Bridge over the Whefry. Mr. Wm. Williams, County Surveyor, Brecon.

CANTERBURY.—March 25.—For Additions to Board Schools. Mr. W. J. Jennings, Architect, 4 St. Margaret Street, Canterbury.

CHESTER.—March 23.—For Erection of Farm Buildings at Lunatic Asylum, Upton. Mr. Stanhope Bull, County Surveyor, Chester.

CHYANDOUR.—April 2.—For Building Police Station, &c. Mr. Oliver Caldwell, Architect, Victoria Square, Penzance.

CLAYTON.—March 16.—For Extension of National Schools. Mr. S. Spencer, Architect, 344 Great Horton Road, Great Horton.

CLERKENWELL.—March 19.—For Enlargement of Fire Engine Station. Architect's Department, Fire Brigade Branch, 21 Whitehall Place, S.W.

CORK.—March 26.—For Building Large Warehouse. Mr. Robert Walker, Architect, 17 South Mall, Cork.

CRAMINGTON.—March 20.—For Building Bakery. Mr. J. G. Crone, Architect, 50 Grainger Street.

DERBY.—March 23.—For Building Infirmary Wards, &c. Messrs. Coulthurst & Booty, Architects, 4 Albert Street, Derby.

DEWSBURY.—March 20.—For Building Club Premises. Messrs. W. & D. Thornton, Architects, Oates Street, Dewsbury.

DORCHESTER.—March 22.—For Rebuilding Shops and Premises. Mr. Arthur Tilley, Architect, 16 Cornhill, Dorchester.

DOWNPATRICK.—March 18.—For Additions, &c., to Lunatic Asylum. The Secretary, Board of Control, Custom House, Dublin.

DUBLIN.—March 18.—For Laundry Buildings for Richmond Lunatic Asylum. Mr. W. H. Byrne, Architect, 20 Suffolk Street, Dublin.

EDMONTON.—April 2.—For Erection of Schools. Messrs Young & Brown, 7 Southampton Street, W.C.

ELHAM.—March 16.—For Erection of Kitchens, Dining Hall, Laundry, Women's Wards, Administrative Buildings, Chapels, Lodge and the Enlargement of Casual Wards. Messrs. Gardner & Ladds, 2 Cheriton Place, Folkestone.

FLEETWOOD.—March 19.—For Building Family Hotel. Messrs. Drummond & Sons, Architects, 13 Preston Street, Fleetwood.

GREAT YARMOUTH.—March 20.—For Building House and Two Shops. Mr. Arthur S. Hewitt, Architect, 10 Regent Street, Great Yarmouth.

GRIMSBY.—March 29.—For Additions to Premises. Mr. D. Pick, Architect, 242 Cleethorpe Road, Grimsby.

GUISELEY.—For Building Wesleyan Chapel. Messrs. Walker & Collinson, Architects, 227 Central Avenue, Swan Arcade, Bradford.

HALIFAX.—March 20.—For Building Five Shops, &c. Messrs. C. F. L. Horsfall & Son, Architects, Lord Street Chambers, Halifax.

HALIFAX.—March 25.—For Building Nine Houses. Mr. Medley Hall, Architect, 39 Northgate, Halifax.

HEBDEN BRIDGE.—March 19.—For Building District Council Chamber, Offices, &c. Mr. John Sutcliffe, Architect, 6 Roomfield Buildings, Todmorden.

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KEYWORTH.—For Additions to Schools. Mr. Frederick Ball, Architect, 5 Houndsgate, Nottingham.

KING'S LYNN.—March 28.—For Erection of Municipal Buildings. Messrs. Philip Tree & Ivor Price, Architects, London Road, St. Leonards-on-Sea.

KNIGHTSBRIDGE.—March 20.—For Paving of Ennismore Gardens Mews. Mr. G. W. R. Wheeler, Surveyor, Town Hall, Westminster.

LLANGATTOCK.—For Building Villa. Messrs. Alfred Swash & John Bain, Architects, Friars Chambers, Newport, Mon.

LONDONDERRY.—March 15.—For Building County Offices, &c. Mr. David R. Babington, Secretary to the Grand Jury, Shipquay Street, Londonderry.

LONGRIDGE.—March 23.—For Building the Cave Memorial Infant School, Berry Lane. Mr. J. A. Seward, Architect, 16 Lune Street, Preston.

LONDON.—March 15.—For Repairing and Maintaining and Decorating Police Stations within a Radius of Four Miles from Charing Cross. The Receiver, New Scotland Yard, S.W.

LOWER GORNAL.—March 18.—For Alterations to Board School. Mr. A. P. Brevitt, Architect, Wolverhampton.

MALPAS.—March 20.—For Building Three Houses. Mr. Wm. Swift, Architect, 31 Lemon Street, Truro.

NELSON.—March 25.—For River Walling, &c. Mr. J. W. Bradley, Borough Engineer.

NEW BENWELL.—For Building Minister's Residence. Mr. John W. Dyson, Architect, 18 Grainger Street, Newcastle-on-Tyne.

NEWCASTLE-ON-TYNE.—March 21.—For Building Two Cottages, &c. Mr. R. J. Jefferson, Todd's Nook, Newcastle-on-Tyne.

NEWCASTLE-ON-TYNE.—April 3.—For Construction of Subway under Railway. Mr. Charles A. Harrison, Central Station, Newcastle-on-Tyne.

NEW WINDSOR.—April 4.—For Extension of Sewage Works. Mr. W. Menzies, Surbiton House, Englefield Green, Surrey.

NORWICH.—April 2.—For Building Baths, Supply of Machinery, &c. Mr. Arthur E. Collins, City Engineer, Norwich.

PADIHAM.—March 19.—For Building Seven Villas. Mr. H. Murphy, Bridge Inn, Padiham.

PONTYCYMMER.—March 20.—For Construction of Gasworks. Mr. J. H. Dyer, Gas Offices, Bridgend.

PONTYPOOL.—March 17.—For Building West Monmouth Boys' School. Mr. Henry Stock, Architect, Denman Street, London Bridge, S.E.

PORTAFERRY.—March 25.—For Building Two Cottages. Mr. Wilson, Architect, 16 Waring Street, Belfast.

POYNTZPASS.—March 21.—For Renovation of Manse. Mr. Wm. Griffith, Poyntzpass, Ireland.

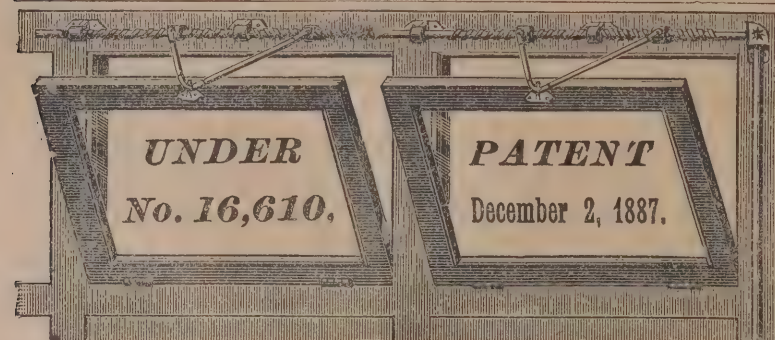
PRESTON.—March 18.—For Construction of Public Abattoir. The Borough Engineer.

RHYMNEY.—March 19.—For Passenger Station. Mr. G. K. Mills, Secretary, Paddington Station.

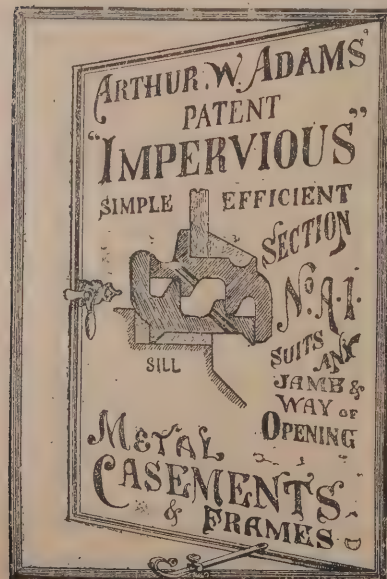
ROCHDALE.—March 16.—For Building Seven Houses at Newhey. Messrs. Butterworth & Duncan, Architects, 4 South Parade, Rochdale.

ROCHDALE.—March 16.—For Alterations to Chapel at Bamford. Rev. J. Hall, 2 Mackinnon Street, Rochdale.

ROCHESTER.—March 20.—For Cottage, Stables and Other Buildings. Mr. Wm. Banks, City Surveyor, Guildhall, Rochester.



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SIDDAL.—March 20.—For Building House, Store, &c. Messrs. Horsfall & Williams, Architects, 15 George Street, Halifax.

SOUTHEND.—March 22.—For Erection of Sanatorium Building. Mr. W. Y. Hobbiss, Clarence Road, Southend.

STANSTEAD ABBOTTS.—April 1.—For Execution of Sewers and Other Works. Messrs. Bailey, Denton, Son & North, Palace Chambers, Westminster.

STAVELEY.—For Building Co-operative Stores and Houses. Mr. J. P. Earle, Architect, Norfolk Row, Sheffield.

STOCKPORT.—March 27.—For Building Workshops and Stores for the Gas Committee. Mr. S. Meunier, Millgate Works, Stockport.

ST. GILES.—March 18.—For Supply of Materials and the Execution of Works for One Year. Mr. H. C. Jones, 197 High Holborn, W.C.

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ST. GILES.—March 18.—For Construction of New and Repairing Existing Sewers. Mr. Geo. Wallace, 197 High Holborn, W.C.

SOWERBY BRIDGE.—March 18.—For Building Store and Twelve Houses. Mr. Medley Hall, Architect, 29 Northgate, Halifax.

UXBRIDGE.—March 20.—For Widening County Bridge. Mr. F. H. Pownall, County Surveyor, Guildhall, Westminster.

WALTHAMSTOW.—March 22.—For Making-up and Paving Several Streets and Erection of Unclimbable Fencing. Mr. G. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow.

WARRINGTON.—March 25.—For Erection of Shed and Modelling Room at Museum. Mr. T. Longdin, Borough Surveyor.

WASHINGTON.—March 18.—For Building Chapel and Schools. Messrs. Davidson & Bendle, Architects, 33 Grainger Street West, Newcastle-on-Tyne.

WEYBRIDGE.—March 20.—For Building House, Coach-house and Stable. Mr. E. M. B. Vaughan, Architect, Borough Chambers, Cardiff.

WHITBY.—March 16.—For Supplying Bath, for the Guardians. Mr. William Seaton Gray, Clerk.

WOOD GREEN.—March 26.—For Erection of Postmen's Sorting Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

TENDERS.

ABERDEEN.

For Construction of Pipe Sewers, with Ventilating Manholes, &c., at North Forest Road, Queen's Road Lane South, and Clifton Road, for the Town Council.

J. LEITH (accepted)	£146	13	8
R. Gair	32	10	2
A. McKay	25	5	2

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G. Wernham, Reading	2,100	0	0
C. C. Robinson, Wolvercote	2,083	0	0
T. Martin, Maidenhead	2,050	0	0
J. Buckle, Abingdon	2,035	0	0
J. GRANT, Banbury (accepted)	1,849	0	0
G. H. Wheeler, Abingdon	1,700	0	0

ASHFORD.

For Building Board School and Master's Residence, with Boundary Walls and Offices, at Ashford, for the Ashford School Board. Mr. HENRY J. JEFFERY, Architect, Ashford.

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D. C. Jones & Co.	956	0	0
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Wallis & Sons	900	0	0
Steddy & Co.	856	0	0
Hayward & Paramor	849	0	0
T. L. Fearon	840	0	0
T. J. Barden	838	0	0
W. & T. Denne	830	0	0

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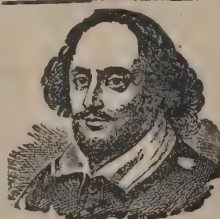
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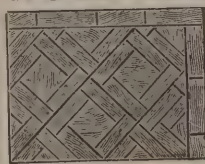


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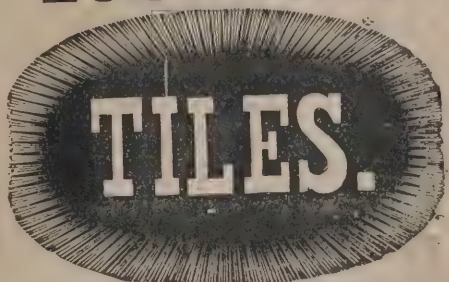
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Jas. Allan, Cardiff	8,698	0	0
Knox & Wells, Cardiff	8,431	0	0
Lathey & Co., Cardiff	8,325	0	0
Harry Gibbon, Cardiff	8,200	0	0
David Davies, Cardiff	7,990	0	0
E. F. Richards, Barry	7,875	0	0
Hy. Davies, Cardiff	7,762	0	0
C. C. DUNN, Cardiff (accepted)	7,600	0	0

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Burt & Vick, Poole	1,750	0	0
Jenkins & Sons, Bournemouth	1,698	0	0
G. Linnington, Swanage	1,685	0	0
W. J. Chinchon, Bournemouth	1,550	0	0
G. Pond, Swanage	1,500	0	0

Amended Tenders.

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G. Pond	1,495	0	0
W. J. CHINCHEN (accepted)	1,460	0	0

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T. Evans, Cardiff	798	0	0
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J. S. Shepton, Penarth	751	0	0
A. G. JAMES, Cowbridge (accepted)	737	17	0

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Collins & Barker, Downham Market	325	10	0
Drake & Purdy, Littleport	315	0	0
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F. Simpson, Swaffham	283	0	0

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R. MACLAREN & Co., Glasgow (accepted)	1,215	5	7

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W. Dixie, Goole	290	0	0
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H. Kelsey & Sons, Goole	243	0	0
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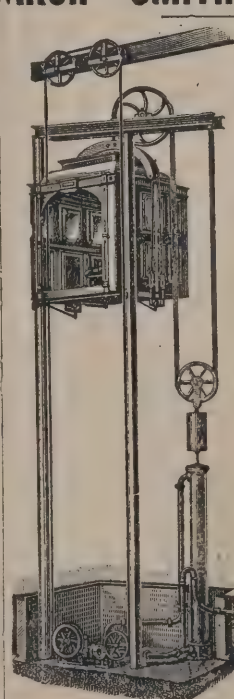
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*Nine tenders.**Adys Road, East Dulwich.*

J. & C. Bowyer (highest) 1,018 0 0

J. Frampton (lowest) 820 0 0

*Ten tenders.**Kilburn Lane, Kensal Green.*

G. H. Sealey (highest) 985 0 0

Yerbury & Sons (lowest) 550 0 0

*Seven tenders.**Lewisham Bridge.*

W. & H. Castle (highest) 397 0 0

Akers & Co. (lowest) 243 0 0

Eight tenders.

For Alterations to 2A Grand Parade, Finchley Road, for

Lloyd's Bank. Mr. HORACE FIELD, Architect.

H. G. DAVENALL, Gospel Oak (accepted) £595 0 0

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MAESTEG.

For Additional Classrooms, Cloakrooms, Outbuildings and Alterations to the Oakwood Schools at Maesteg, for the Cwmdu and Llangynwyd Higher School Board. Mr. E. W. BURNETT, Architect, Tondy, near Bridgend.
D. Jones & Co., Gloucester £1,478 0 0
P. Gaylard, Bridgend 1,385 0 0
I. Rees, Maesteg 1,368 0 0
E. EVANS, Maesteg (accepted) 1,214 0 0

MIDDLESBROUGH.

For Additions to Denmark Street School, for the School Board.
BASTIMAN BROS. (accepted) £3,732 2 0

NAVIGATION.

For Building Boys and Girls' School and Extension of Mixed School, at Navigation, Aberdare Junction, to Accommodate 600 Children, for the Llanwonno School Board. Mr. A. O. EVANS, Architect, Post Office Chambers, Pontypridd.
W. Williams, Pontypridd £4,649 0 0
C. Jenkins & Son, Porth 4,600 0 0
J. Rees, Ynysybwl 4,534 0 0
D. C. Jones & Co., Gloucester 4,492 0 0
Williams & James, Pontypridd 4,409 0 0
A. J. Howell & Co., Cardiff 4,275 0 0
D. Jenkins, Swansea 4,190 0 0
D. Davies, Cardiff 4,045 0 0
Lissaman, Chipping 3,988 0 0

NEWSHAM.

For Building the Isabella Infants' Schools, Newsham, for the Cowpen School Board, Blyth. Mr. J. H. MORTON, Architect, 50 King Street, South Shields.
Phalp & Bird, Blyth £1,956 8 0
Barron & Temple, Blyth 1,891 11 6
H. Brown & Co., Newcastle 1,885 0 0
R. Allison, Whitburn 1,882 0 0
J. N. Heatley, Blyth 1,814 1 11
J. Elliott, North Shields 1,800 0 0
Brown & Beutymann, North Shields 1,773 7 0
W. Lilburn, Blyth 1,757 10 10
T. L. Miller, North Shields 1,737 11 6
W. Brown, Whitburn 1,719 17 0
J. SIMPSON, Blyth (accepted) 1,718 10 0
Cooper & Henderson, Jarrow 1,667 14 0

NORTH CURRY.

For Building Detached House, for Dr. H. P. Olivey. Mr. F. W. ROBERTS, Architect, Taunton.
F. W. ROWSELL (accepted) £787 0 0

PENARTH.

For Additions to St. Maeburne, Penarth, for the Misses Sumners. Messrs. HABERSHON & FAWCKNER, Architects, Cardiff.
Lattey & Co., Cardiff £768 0 0
J. S. Shepton, Penarth 719 0 0
A. J. Howell & Co., Cardiff 690 0 0
Hatherly & Carr, Bristol 677 0 0
D. Davies, Cardiff 672 0 0
W. Maddren, Cardiff 672 0 0
Pickford & Son, Penarth 660 0 0
Jones & Thornley, Penarth 650 0 0
J. Jones, Penarth 646 0 0
J. Styles, Cardiff 620 0 0
A. Berridge, Cardiff 600 0 0
D. G. Price, Penarth 598 0 0
Knox & Wells, Cardiff 583 0 0
T. Wood & Son, Whitchurch, Cardiff 550 0 0
H. Morgan, Cardiff 505 16 0
B. EVANS, Cardiff (accepted) 486 0 0

POOLE.

For Corn Store, Stable and Coach-house, for Mr. Warn, High Street. Mr. E. VAN SCHEPDAEL, Architect.
E. R. Tilsed, Poole £415 18 6
T. C. Rigler, Poole 325 0 0
A. D. Saunders, Poole 290 0 0
W. H. GRAY, Poole (accepted) 285 0 0
Architect's estimate 306 7 0

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W. BEVERIDGE, Cullen (accepted) £948 0 0

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PONTYPRIDD.

For Contract No. 7, Gas-Condenser; No. 11, Washer Scrubber, for the Pontypridd Urban District Council. Mr. THOMAS NEWBING, C.E., Engineer, 5 Norfolk Street, Manchester.

Contract No. 7.

Barrowfield Ironworks, Limited	£858	0	0
Whessoe Foundry Co.	455	0	0
Kirkham, Hulett & Chandler, Limited	440	0	0
CLAPHAM BROS., Limited, Keighley (accepted)	327	10	0
C. & W. Walker	300	0	0
S. Cutler & Sons	295	0	0
E. Cockey & Sons, Limited	251	0	0
Newton, Chambers & Co., Limited	220	10	0
R. & J. Dempster, Limited, Manchester	215	0	0

Contract No. 11.

Whessoe Foundry Co., Limited	999	0	0
Barrowfield Ironworks, Limited	770	0	0
S. Cutler & Sons	375	0	0
CLAPHAM BROS., Limited (accepted)	372	10	0
C. & W. Walker	368	0	0
W. C. Holmes & Co.	355	0	0
G. Waller & Co.	336	0	0
Kirkham, Hulett & Chandler, Limited	310	0	0
E. Cockey & Sons, Limited	278	0	0
R. & J. Dempster, Limited	130	0	0

TAUNTON.

For New Tile Roofs and Alterations to Pinkhurst, Staplegrove, for Mr. H. G. Turner. Mr. F. W. ROBERTS, Architect, Taunton.

VICKERY & POOLE, Milverton (accepted) . . . £445 0 0

TENDRING.

For Alterations to Old Schools and Building New Classrooms, Boundary Walls, Offices, &c., for the Tendring School Board. Mr. J. W. START, Architect, Colchester, Clacton-on-Sea and Harwich. Quantities by the Architect.

Alterations.

R. Beaumont, Lexden	£190	0	0
T. Canham, Weeley	173	15	0
E. West, Chelmsford	169	0	0
H. J. Linzell, Clacton-on-Sea	169	0	0
Girling & Coe, Ipswich	137	0	0
Smith, Beaumont & Dawson, Harwich	136	6	0
E. Saunders, Dovercourt (not complete)			

TENDRING—continued.*Classrooms.*

E. Saunders	£840	0	0
R. Beaumont	775	0	0
T. Canham	746	10	0
Girling & Coe	738	0	0
E. West	700	0	0
Smith, Beaumont & Dawson	617	13	6
H. J. Linzell	607	0	0

Covered Playgrounds, Offices, Drainage, &c.

Smith, Beaumont & Dawson	316	14	0
T. Canham	315	0	9
E. West	312	0	0
H. J. Linzell	303	0	0
R. Beaumont	300	0	0
Girling & Coe	299	0	0
E. Saunders	294	0	0

Gravelling Playgrounds.

T. Canham	319	0	0
Smith, Beaumont & Dawson	306	7	0
H. J. Linzell	294	0	0
R. Beaumont	260	0	0
Girling & Coe	242	0	0
E. Saunders	224	0	0
E. West	199	0	0

Boundary Walls, &c.

Smith, Beaumont & Dawson	219	3	0
R. Beaumont	175	0	0
T. Canham	170	5	0
E. West	166	0	0
Girling & Coe	164	0	0
H. J. Linzell	163	0	0
E. Saunders	156	15	0

Park Fencing to Boundary.

E. Saunders	224	0	0
R. Beaumont	125	0	0
Smith, Beaumont & Dawson	118	13	0
Girling & Coe	118	0	0
E. West	112	0	0
T. Canham	103	15	0
H. J. Linzell	97	0	0

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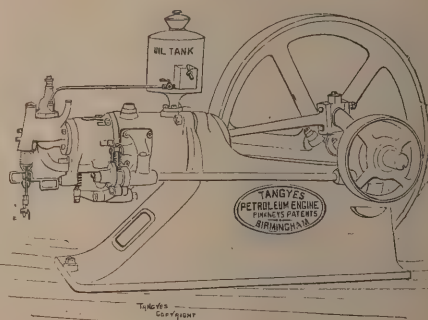
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R. Beaumont	152 0 0
Smith, Beaumont & Dawson	141 2 0
Girling & Coe	141 0 0
T. Canham	126 0 0

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TONBRIDGE.

For Building of New Commercial School, Brook Street.

J. Godfrey & Co., London	£10,087 0 0
Grover & Son	9,669 0 0
B. E. Colls & Son	9,661 0 0
Dove Bros.	9,625 0 0
T. Rider & Son	9,603 0 0
Holloway Bros.	9,590 0 0
T. Steed	9,290 0 0
C. Gallard, Southborough	9,084 0 0
E. Punnet & Sons, Tonbridge	9,040 0 0
Strange & Sons, Tunbridge Wells	8,889 0 0
G. E. Wallis & Sons, Maidstone	8,676 0 0
T. Turner & Co.	8,637 0 0

TRURO.

For Alterations and Improvements at the City Police Station, for the City Council. Mr. W. CLEMENS, City Surveyor.

C. & J. Harris, Truro	£144 15 0
H. Tippet & R. Farley, Truro	140 19 6
W. J. TIPPET & J. CLARE, Truro (accepted)	135 10 0

WANSTEAD.

For Additions to Downsall Road Schools, for the Wanstead School Board. Mr. JOHN T. BRESSEY, Architect, 70 and 71 Bishopsgate Street Within, E.C.

D. C. Jones & Co., Gloucester	£5,743 0 0
Hearle & Farrow, St. George's, E.	5,579 0 0
J. Potter, Horsham, Sussex	5,380 0 0
A. Reed & Son, Stratford	5,375 0 0
T. White & Son, Bow	5,350 0 0
Coulsell Bros, Bethnal Green	5,319 0 0
J. Catley, Leytonstone	5,249 0 0
H. R. Rons, Grays, Essex	4,878 0 0
Architect's estimate	5,035 12 6

YEOVIL.

For Building the Cole Memorial Church, Yeovil, Somerset.

Mr. J. NICHOLSON JOHNSON, A.R.I.B.A., Architect, 21 Princes Street, Yeovil.	
Andrews, Thornford	£9,650 0 0
Stephens, Bastow & Co., Limited, Bristol	8,998 0 0
Haywards & Woster, Bath	8,899 0 0
Symonds, Cardiff	8,500 0 0
Cowlin & Sons, Bristol	8,173 0 0
Bird & Vippard, Yeovil	7,873 0 0
Pollard, Bridgwater	7,499 0 0

YOULGREAVE.

For Building Chapel and Sunday-school, Youlgreave (near Bakewell), for the Primitive Methodists. Mr. HENRY HARPER, Architect, Market Place, Nottingham.

J. Vains	£1,308 19 5
Knowles & Son	1,297 0 0
L. T. Wildgoose	1,248 0 0
W. & G. Tofts	1,090 0 0
Skimwell, Evans & Co.	1,035 0 0

Note.—Foundations, Boundary Walls, &c., not included. The Stone for Walling, &c., is all given.

BUILDING TRADES' EXHIBITION.

A MEETING of the Consultative Council was held at the offices of the above Exhibition, 222 Strand, W.C., on the 12th inst., the following members being present:—Professor Banister Fletcher, J.P., F.R.I.B.A. (chairman); F. R. Farrow, F.R.I.B.A.; T. Locke Worthington, A.R.I.B.A.; J. E. Sears, F.R.I.B.A.; Thomas Minton, J.P.; E. Benedict, C.E.; E. J. Kibblewhite, A.S.A.; H. Greville Montgomery, G. M. Callender, and T. Freeman. It was reported that the R.I.B.A. had agreed to give assistance in judging the competitive handicraft, and that they would also lend models and drawings for exhibition. The City Companies had nominated the following gentlemen as judges to represent them:—Mr. W. Grellier, F.R.I.B.A.; Tylers and Bricklayers' Company; Mr. S. S. Hellyer, plumbers; Mr. James Greenwood, masons. Mr. B. E. Nightingale was nominated by the Clerk of Works Association. The following lectures were arranged for:—Professor Henry Robinson, M.I.C.E., on "Electricity;" Professor Banister Fletcher, on "Comparative Architecture," with oxy-hydrogen illustrations; Mr. Arnold Statham, barrister-at-law, on "Building Law."

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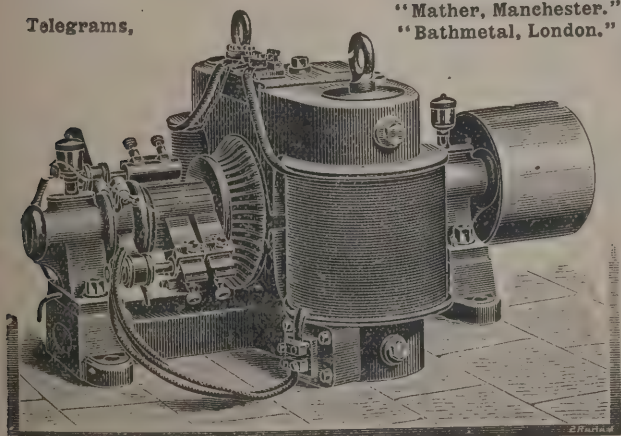
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ELY COURT, CARDIFF.—THE STAIRCASE.

FIREPLACE IN DINING-ROOM, CURLING HALL, LARGS, N.B.

TRADE NOTES.

A LARGE new clock and chimes, of Lord Grimthorpe's design, have been erected in the parish church of Halesowen, near Birmingham, and formally started by a former rector of Halesowen (Canon the Hon. F. G. Pelham). It is fitted up with all the latest improvements, and will doubtless be a boon to the inhabitants. The whole of the work has been carried out by John Smith & Son, Midland Clock Works, Derby.

THE Cottage Hospital, Fleetwood, is being warmed and ventilated by means of Shorland's patent Manchester stoves, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

AT the meeting of the Spalding Urban District Council a scheme was adopted for considerably extending and improving the public lighting of the town. It was also decided to erect another gasholder and carry out other improvements at the Spalding Gasworks, at an estimated cost of 3,000*l*.

VARIETIES.

IN connection with the Manchester, Sheffield and Lincolnshire Railway Extension to London, Mr. Edmond Fuller (Fuller & Fuller), the surveyor appointed by her Majesty's Board of Trade, has now made his award in respect of the several hundreds of houses required on the Eyre Estate in Hampstead and Marylebone for the purposes of this new line, and in respect of which it is understood a claim was made approaching some half a million of money. The amount of the award will now be deposited in the Bank of England, thus enabling the Company to take immediate possession of the several pro-

perties after settling with the occupying tenants and others many of whom have already quitted possession.

WE are informed that Mr. C. H. E. West, lately assistant surveyor to the Hackney Board of Works, has been admitted partner in the firm of Macer & Fitzwilliam, now carrying on business as auctioneers, surveyors, land agents and valuers, at 39 Cheapside, E.C.; 75 Crouch End Hill, N.; and (as surveyors to the London Financial Association) at the Alexandra Palace, Wood Green.

THE Finance Committee of the Liverpool Corporation have received sanction from the Local Government Board to borrow 60,000*l*. for reconstruction of the baths at the pier-head.

THE result has been published of the competition invited for the sewerage and sea outfall works at Oban. There were twenty-five designs sent in for selection. The Town Council appointed a professional assessor in Mr. T. Niven, C.E., Glasgow, and under his report the plans judged best in order of merit were—first, "Kerrera;" second, "Gravitation." The author of the first premiated design was found to be Mr. Woulfe Brennan, C.E., of Oban, and of the second Mr. Radford, C.E., of Nottingham.

THE head of Trapnell & Gane, a firm of art furnishers and cabinetmakers, well known in Bristol, has retired. Mr. Caleb Trapnell on the occasion entertained a large gathering of his friends and employes, who presented him with a handsome silver inkstand.

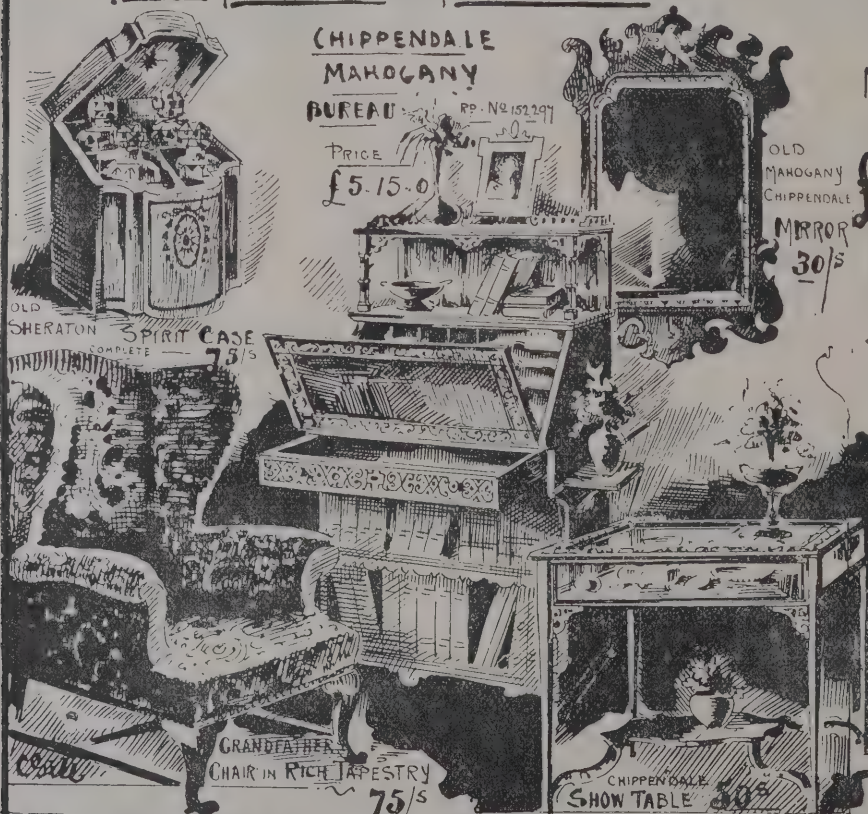
AN inquiry has been held in Halifax respecting the application of the Town Council to borrow 33,000*l*. to complete the markets, from the designs of Messrs. Leeming & Leeming.

AT the meeting of the Ossett Town Council it was proposed to begin the building of a municipal hall, estimated to cost over 8,000*l*. The consideration was deferred.

At the meeting of the Glasgow Association of Students of the Institution of Civil Engineers, Mr. D. Drummond, M.Inst.C.E., president, in the chair—a paper was read by Mr. James L. Proudfoot, Assoc.M.I.C.E., on "Two-Storey Goods Sheds at Cessnock Docks." The sheds have been erected by the Clyde Trustees on the north and south quays of the new Cessnock Docks, and differ from the older sheds in being double-storeyed.

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CARVED OAK AND ANTIQUE DEPARTMENT, No. 204 TOTTENHAM COURT ROAD.

MR. A. MILLAR will read a paper on "Practical Carpet Designing" at the meeting of the Society of Arts on Tuesday.

AN inquiry has been held at Middleton into an application by the Town Council for sanction to borrow 38,710*l* for the execution of a scheme of sewerage and sewage disposal. The town clerk (Mr. F. Entwistle) explained that the original scheme was arranged by the engineers, Messrs. Hinnell & Proctor, of Bolton, or carrying out the international process of sewage purification by means of ferozone and lolarite, and comprised three rectangular precipitation tanks of a total capacity of 550,000 gallons, polarite filters of 1,200 square yards, sludge-pressing machinery, &c. The revised scheme now submitted has been arranged to include the improved form of continuous upward-flow circular tanks with the Candy sludge removal apparatus, whereby the sludge will be removed without interference with the continuous flow of the sewage; also clarifiers for the removal of all light flocculent matter, which otherwise would be deposited on the superficial layer of sand in the filters. By reason of this complete clarification of the tank effluent the engineer has been able to arrange the filters at the reduced area of 600 square yards, containing two layers of polarite, each 6 inches thick, working at double the speed of the original 6-inch layer filter. The filters will also be arranged with special aerating layers.

NOTES ON NOVELTIES.

Aspinall's "Wapicti" is a new washable distemper paint that can be manufactured in any tint, and which has been designed for application to plaster, stucco, brick, stone, cement, &c. It is capable of yielding good artistic effects by stencilling, and therefore adapted for livening up interiors by decoration, having a flat surface suited for the purpose. Among the advantages claimed for "Wapicti" are that on exterior work it dries with a surface impermeable to the most drenching rain, and can be used with advantage for farm dwellings, wooden or other houses, and general work on estates, that the effect obtained with it is far superior to that of flatted paint, and costs one-third less. It is very largely used for painting the walls of asylums, churches, hospitals, railway stations, schools, private houses, &c. We have recently tried Wapicti, and can quite endorse all that Messrs Aspinall have claimed for this paint.

A New Fire-escape.—We hear that Mr. H. Wybrow, of Birmingham, has invented a fire-escape of a novel description.

It can be fitted when not in use against the front of a house in the form of a balcony. It is ornamental in appearance, and is intended to be fixed beneath the windows of the sleeping apartment. In case of fire all that is necessary is to liberate a lever and one end of the balcony falls to the ground, and by an automatic arrangement the strips of metal forming the floor are converted into steps down which the inmates may descend in safety. The escape has been submitted to some of the leading surveyors and engineers of Birmingham, who have reported favourably upon its utility. It is especially adapted to large buildings, and may be made of any size and, we are informed, at a reasonable cost.

THE NEW FEVER HOSPITAL FOR GLASGOW.

THE fortnightly meeting of the Glasgow Police Board was held on the 11th inst., Lord Provost Bell presiding. An animated discussion, which lasted over an hour, took place in regard to the fixing of the contract for the mason, digger and brickwork of the new fever hospital at Ruchhill. When the tenders were opened the lowest offerers were found to be Messrs. William Steven & Sons. Subsequently the committee decided that the whole contract should be completed within two years, and they made that period of time a condition of the acceptance of the contract. Messrs. Steven & Sons wrote that they could not undertake the work within the period named. The next three lowest offerers were then written to, and Messrs. Morrison & Mason, Limited, having undertaken to finish the building in the stipulated time the committee recommended that the contract should be given to them, although their price was about a thousand pounds higher than that asked by Messrs. Steven. Councillor Martin moved that the matter be taken back for reconsideration, as he saw no pressing necessity for having the building completed in such a hurry. This was seconded, and in the discussion which followed it was remarked that it almost seemed as if the time limit had been an afterthought with a view to favour certain contractors. This statement was warmly repudiated by Councillor Crawford, the chairman of the committee, and the contract was by a large majority eventually awarded to Messrs. Morrison & Mason, Limited, whose contract price is 102,805*l*. A clause was ordered to be inserted in the contract making the contractors liable to a penalty of 10*l*. for every day they might exceed the time limit in completing the work.

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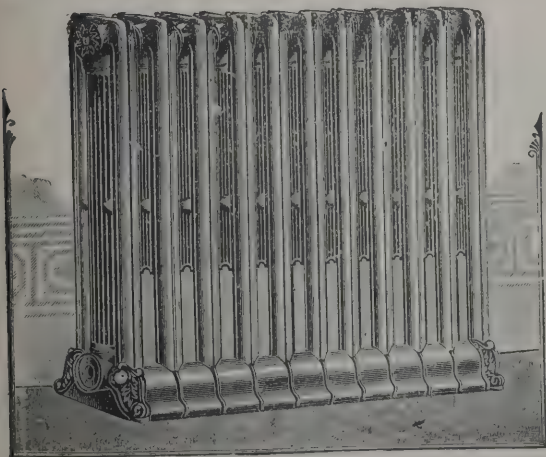
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DISCOVERY OF AN ANCIENT SEWER.

AN interesting discovery has been made in Chiswell Street, where the men in the employ of Mr. W. F. Coney, of 66 Fenchurch Street, who is erecting a large block of buildings on the vacant site at the corner of Milton Street and Chiswell Street, came across an enormous piece of brickwork 100 feet in length and about 10 feet or 11 feet in diameter, which has lain like a huge leviathan at the back of the Chiswell Street houses so long that it had passed out of the recollection of the oldest inhabitant. We are not able to fix the date of its construction or use, but as the houses which were built over it were some 150 to 200 years old, it may take us back to the days when John Milton was a resident in the neighbourhood, or even much earlier. What now remains of the work seems very solid and well constructed. The drain, we are informed by Mr. Coney, was full of refuse, which had so saturated the soil beneath it that his men had to go down 8 feet below to the "maiden soil" before they could find a satisfactory foundation for the iron columns which are to support the new building. It is somewhat startling to learn that for many years a coffee-shop kitchen, where the coffee for several generations of Londoners has been innocently brewed, stood directly over one portion of this not too savoury relic of our ancestors. Among the articles which the workmen found in the excavation of other portions of the site were some coins of the Georges, some small vessels of the early days of the manufacture of English pottery, a chimney ornament, a curious stone flagon (which might possibly be identified, as it bears a maker's mark), some fragments of stoneware, and a small quantity of tobacco-pipes of the days of Charles I. Some of these last, which we did not see, we are informed measured some 10 inches in length, and have small bowls and stems a quarter of an inch in thickness.

THE executive committee of the Association for the Promotion of Art and Music in the City of Glasgow have received from the architects a report on the progress of the art galleries in Kelvingrove Park during the month of February, from which it appears that building operations, till now at a standstill owing to the weather, are being resumed. The working of stone under cover is still in progress, and the construction of the main drain has, in spite of the severity of the weather, been completed.

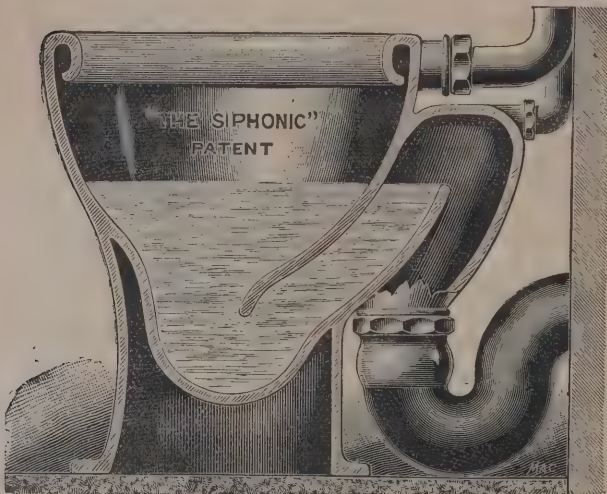
WORKHOUSE ACCOMMODATION IN LIVERPOOL.

AT the meeting of the Liverpool Workhouse committee on the 7th, the following communication from the Secretary of the Local Government Board was read:—

"I am directed by the Local Government Board to state that they are informed through their inspector (Mr. Jenner Fust), that the select vestry of the parish of Liverpool have postponed the consideration of the report upon the accommodation at the Brownlow Hill Workhouse which was sent them in August last until the removal of certain of the inmates, for whom accommodation is being prepared at Kirkdale, has been effected. The Board consider the question of making further provision for the indoor poor of the parish of Liverpool to be of such pressing importance that they are unable to acquiesce in any avoidable postponement of its consideration. They would remind the select vestry that the class of inmates it is intended to remove to Kirkdale is that of the healthy adults, and that their removal will in no appreciable degree affect the accommodation for the sick nor enable the attic wards of the male and female hospitals to be vacated. The Board desire to point out that the vestry in their letter of October 23, 1894, admitted that the time had arrived when the necessity of providing further accommodation for the indoor poor must be recognised, and that they also concurred with the view taken in the above-mentioned report, that nothing can ever render the attic wards of the male and female hospitals suitable for permanent occupation by any class of hospital patients. The Board must request that the whole subject may receive the earliest and most serious consideration of the vestry, and that they will, with the least possible delay, submit for the Board's consideration a comprehensive and adequate scheme for providing satisfactory accommodation for the indoor poor of the parish of Liverpool."

The Chairman said that he had been rather in favour of

OUR HEALTH IN WINTER.—Dr. Andrew Wilson, writing in *Lloyd's Newspaper* on diet, says: "The teaching of nature should never be neglected, and in the matter of winter food let us see we are not wrong, and take sufficient fat, for the changes that result in the wear and tear of our bodies are lessened in intensity by the fat of food, and the need for flesh is always less when fat forms a due proportion of our diet." The Doctor proceeds to enumerate natural products that are admirable, among them "Cocoa" with its contained Cocoa Butter. Relatively to this it may be said that EPPS'S PREPARED COCOA retains all the constituents of the natural Cocoa, including the oil or butter, intact.—ADV.



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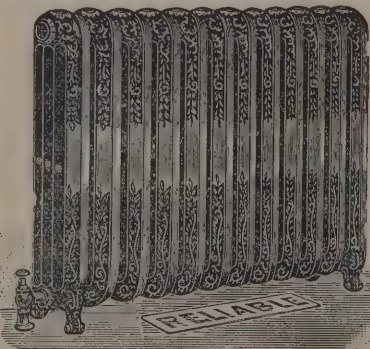
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postponement of the subject, but in view of this letter he was now of opinion that the time had come to take the matter up. Every section was overcrowded; and if they were to build a new workhouse, which was very likely to be the case, the idea was to build it elsewhere. They had now no room for classification, and that was the thing they would have to consider in building a new workhouse.

It was decided to leave the question to the decision of the vestry.

HULL MASTER BUILDERS' ASSOCIATION.

THE annual dinner of the Hull Master Builders' Association was held at the Grosvenor Hotel.

The president (Mr. T. Goates) occupied the chair, and was supported by the Mayor, Mr. Knowles (vice-president), Councillors Skinner, Wharram, Newham and Scott; Messrs. W. A. Gelder, John Hancock, J. Pantom, G. Houlton, Good, Townsley, J. Temperton, Peers, F. Sweeting, Sangwin, B. Robinson, Moody, Leake Bros., Bray, Goates, jun., W. Drury, B. Nicholson, Beevers, W. Beal, Rowland, W. Bailey, Carr, Caley, Quibell and Son, W. Hodgson, Southern, Wright, W. Harrison, J. Beal, Watson, Thorpe, Gaskill, Marsden (treasurer), Stanley (secretary), &c. After the tables had been cleared, and the usual loyal toasts submitted and heartily drunk, Mr. Vincent Knowles, in submitting the "Army, Navy and Volunteer Forces," said there were several battleships yet to be constructed, and he hoped that the Hull firm would be fortunate in securing a contract, thus being a boon for the good old town of Hull.

Mr. F. H. Pearson thought there would be no difficulty in getting ships up to the contract speed, and even perhaps a knot or two faster. He hoped that Hull would obtain still further contracts, for now was the time to build ships, with the price of iron, material and labour. There was plenty of idle labour and they in Hull could well do with the employment of a thousand additional men. Now was the time to do it, and with the employment of further men he was sure the people would not grumble at paying the money.

The President said before they went further with the speeches he would, on behalf of the Association, thank the Mayor for his presence amongst them that evening. That was the second time he had been the Mayor of Hull, and he trusted that he would be so for the third year in succession. It was with great inconvenience that the Mayor attended their annual dinner for the second time, and it showed his appreciation of them as a body.

Mr. James Townsley, in submitting the toast of "The Mayor and Corporation," said he was sure he could extend the same hearty and cordial welcome to the Mayor as the President had done. They were pleased to see him amongst them. He was sure that everyone present would unite with him in congratulating his Worship the Mayor not only upon his promotion to the aldermanic bench, but also on his re-election for a second year to the high and noble position of being the chief magistrate of Hull. They had had many good mayors, but he was sure that they rarely had had one who had so ably conducted the affairs and business of their town as Alderman Richardson, and he did not think any other mayor had had such an united confidence, both of his colleagues and ratepayers generally, as their present Mayor. He thought there was sadly too many grumblers in Hull at the present time. He was referring more particularly to some of the ratepayers who resorted to public letter writing. It would be better if these people rather devoted themselves to the support of the Mayor and Corporation—better for them and the town generally. He did not agree with some people that Hull was half a century behind the times, for as good work was being done in Hull at the present time as ever was. Their present Mayor was always charitably disposed towards alleviating the great distress in the town, and ever ready to appeal on their behalf. He had great pleasure in submitting the toast.

The Mayor, in responding, expressed his sincere thanks for the cordial manner in which they had welcomed him. He was pleased to hear that the efforts he had endeavoured to make had, in their opinion, been successful. He could only say that one reason why his term of office had been so far—in the opinion of many gentlemen who had been kind enough to say so—successful was that he had been surrounded by a loyal band of colleagues who had given him their hearty and sympathetic support. That Association was well represented in the Hull Town Council. Some of its most prominent members were connected with their trade. Mr. Skinner, Mr. Wharram and Mr. Scott were men most earnest he was sure in their desire to promote the public welfare. In his opinion it was one of the most singular and most pleasing things that they had to remember in connection with this nineteenth century, the vast amount of voluntary work that was given by gentlemen who were engaged in busy commercial lives—in philanthropic work, in social undertakings, in educational work, and in many spheres—gentlemen who were willing to give their services without any hope of fee or reward, for the benefit of

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their fellow men. He could say, from a long experience in the Corporation, that so far as his experience went the gentlemen who sat upon those benches did not go there to represent their own interest, but to endeavour, so far as they could, to advance the interests of the town and promote its welfare. He asked them not to think that they were indifferent to the expenditure which was absolutely necessary to be incurred in the good government of a town like Hull. The estimates which were brought forward from time to time were carefully considered by the various committees who had charge of the expenditure in their various departments. He was sure that nothing gave them greater concern than the advances which had necessarily to be made from time to time. The greatest interest was taken in their estimates, and if they had to be increased it was only by a strong sense that public interest demanded it. He need not tell them that, whilst they had many public duties to perform, the state of the town generally excited their grave attention—he meant the present unfortunate distress that existed in their midst. He believed that for some time building operations had been practically suspended, necessarily causing a vast amount of distress. It must be pleasing to those present that the members of their police force, in response to an appeal he himself made to them, had come forward so generously and worked so assiduously for the relief of the distress of the children. At all the branch police stations he believed that free meals were given to those in absolute need. He did not know any better method of distributing relief than by the hands of the police, for they were acquainted with nearly all the deserving cases in the town. That Association represented an important interest in the country at large and the allied trades connected with it. It was sometimes said that the work done to-day was not so good as that done years ago. But he took an exception to that remark. He thought the builders and architects of to-day were quite equal to any that had gone before. If any blame was to be given he thought it must be given to the public, who wanted houses that were really worth 50% or 60% a year for 40%. The people who criticised the work of the builders should remember that if they were willing to pay the price they would get as good an article now as ever could be produced by the art of the builder.

Mr. W. A. Gelder, in proposing the "Hull Master Builders' Association," said that it was wise for an architect, as he was, to desire the success of the master builders. They were so closely allied that success to one meant, he thought, success

for the other. Their Association represented a considerable number of the community of Hull. The employers of labour present, either directly or indirectly, were a great multitude, and therefore, in proposing success to the Hull Master Builders' Association, in one respect he was wishing success to the town of Hull generally. They were living in a time when work was in a state of languor. They were not living in prosperous times, but he trusted that would soon be rectified. That Association was formed not so much as an organisation to raise prices or form a ring to keep up the cost of buildings, but to insure good work being accomplished. Some people imagined that that organisation existed simply to regulate prices, but that was not the chief factor. Their object in combining was to insure a better class of work being accomplished in their midst, and to meet the combinations which were formed in other directions. He had not one word to say against combinations of labour, because in this present age they appeared to be a necessity, but so long as they were a necessity for one party they were for another. He was of opinion that the time would come when all strikes and lock-outs and friction between employer and employed would be avoided for consideration of each other.

The President, in responding, said their Association was not formed as a defiance but a defence. He had been in the trade for forty years, and his experience was that more consideration should be shown to the working men. If they treated the men well his experience was, though there were black sheep in every flock, that they treated the masters well. The men were not so black as they were painted. If they would give them more consideration than they did, he was sure it would be a paying investment. He hoped that strikes were a thing of the past, and that disputes would before long be settled by conciliation or by arbitration, for strikes never did any good to anyone, but caused many to suffer and drove trade out of the country. If all the members of the Association would stick to it and its principles he was sure that the sun of peace and prosperity would never cease to shine on that Association.

Councillor Skinner ably submitted "The Architects."

Mr. P. Gaskell, in responding, thought that if the new Municipal Buildings were ever to be erected, only Hull architects and builders should be employed, for he was sure they could show as good a return as any from other towns.

Councillor Wharram, in submitting "The Town and Trade of Hull," drew attention to the great amount of distress in the



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town, and thought that that Association should do something to alleviate it. He suggested a subscription on the spot, and he would head it with a guinea, to be given to the Chief Constable to help to feed the poor destitute children of Hull.

Mr. T. Liggins suitably responded.

THE CARDIFF IMBROGLIO.

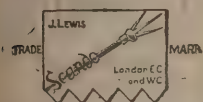
IN addition to the letters already printed the following have appeared in the Cardiff *Western Mail* :—

Sir,—May I ask Mr. E. M. B. Vaughan, through your columns, to do me the favour of taking this letter to you as an answer to one from him in this morning's *Western Mail*? I am writing to him to thus oblige me, and to so save time and trouble. Mr. Vaughan complains of publicity being given to this matter. I should have thought such a complaint at present a little out of date, and I am anxious to emphasise the fact that nothing is more needed herein than the unbiassed inquiry which publicity insures. Mr. Vaughan thinks this question of "little or no public interest." The careful attention which the press has given it has, however, declared otherwise. But if we are to discuss the question of publicity we must go back a little, and look for certain portentous paragraphs sent to the press before any meeting of architects on this matter, and which gravely set forth the resolution it was intended to carry. After that meeting we shall find further paragraphs duly announcing the weighty decision arrived at, viz. that public competition was to be petitioned for. One must suppose that "public interest" was then fully satisfied. At any rate, the publicity of January, 1895, was evidently a most acceptable and good thing; but the publicity of March, 1895, is bad—very bad. Yet the only discernible difference is that the first was supposed to have acted the play through and rung down the curtain, whilst the last varies from it only in disclosing the staying powers of that most uncompromising of all young persons, whose proper abiding place is usually at the bottom of a well. Those January shots (which included the architects' petition as a final broadside), though doubtless intended to kill at short distance, somehow missed fire. I still suspect the cause to be (in spite of Mr. Vaughan's letter this evening, that the gun was overloaded—too many names, in fact, rammed into it along with the recognised lawful charge. Later on, ten days ago, I wrote a letter of regret to Mr. Vaughan for non-attendance at the annual dinner of the architects, adding to it a review of the respective relations of

the Society and myself. It was, of course, too much to expect that missive to be discussed there, but I did expect the usual courtesy of some slight reference to the fact that the ex-president had written regretting non-attendance. Finding the letter was wholly suppressed, and recollecting that a previous letter of importance from me to the secretary had met with a similar fate, I felt that those inquiries which representatives of the Press were then making from me deserved very thoughtful recognition, and, on request in each instance, I most willingly handed over proper copies for their use on it being pointed out that Mr. Vaughan would probably persist in remaining reticent, and withholding my letters from those gentlemen's inquiries. I can appreciate Mr. Vaughan's surprise on his seeing my letter in print before he could reply to it, for I had a similar experience last week with his, which I saw in print some time before receiving it. But, seriously speaking, I feel it must be recognised that many features of this matter are most properly discussible in the Press, to which obligation is due as affording some means for what is just and right in it being made plain. I shall clear up one of Mr. Vaughan's chief points at once by directing him to his letter this morning, to observe a small but important change of phraseology which he makes in quoting my letter. He quotes :—"You say that we have influenced the authorities to such an extent as to cause you to be deprived of the position," &c. He will see my actual words to be :—"The course which has been followed in endeavouring to so influence the authorities as to cause me to be deprived," &c. Respecting the first quotation, Mr. Vaughan expresses his view that "such action would stamp the conduct of those present at the architects' memorial meeting as dishonourable and unprofessional." Of his two adjectives I will not adopt the first, but I thank him for his application of the second, and I willingly agree with him that any assertion that the architects "have influenced the Corporation to deprive" me of this work "is a base, unworthy and groundless charge." They certainly have not done so—as yet.

Now as to the true pith of this question. Mr. Vaughan has previously made it clear that the Architects' Society action—good or bad—was based on two facts; the one a letter from Dr. Vachell, the other a statement by Mr. Edwin Corbett, and my making further reference to these gentlemen is necessary if I am to meet Mr. Vaughan's charge that I am "confusing the issues." Therefore I will now try to clear them, especially as a little reticence on my part hereon may have given some colour of reasonableness to Mr. Vaughan's desire.

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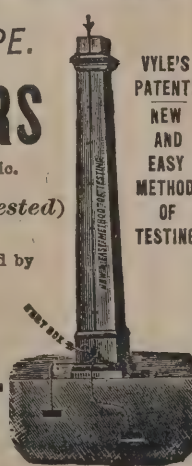
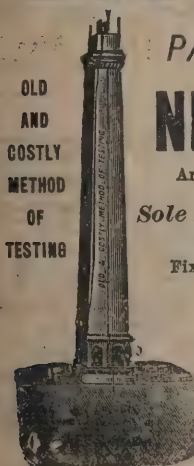
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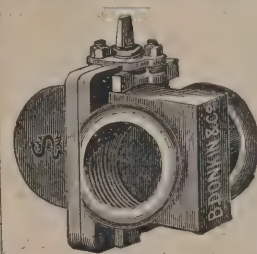


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With Dr. Vachell, as a friend of years past, and a truly enthusiastic colleague in this and many allied matters, I will find no fault if he does what he has every right to be doing, viz. desiring to see someone rather than myself acting as architect for the museum. His letter does not appear to me to do more than express his own personal views, and his statement that the building committee had not been called together is absolutely correct. But how "several other members" of the museum committee became "firm in their opinion that I have no claim, legal or moral," or what reasons they may have for the said firmness of opinion, is, I confess, a bit puzzling, seeing they had "not even been called together," which non-calling I can corroborate, for no committee of the museum has ever discussed my claims, nor has ever been in the least degree commissioned to pronounce upon them. I am really curious to know these "other members," for I feel assured I have never yet met them. And if they do exist, their pronouncements respecting my position are in any case quite *ultra vires*. That fact must have been quite self-evident to the architects; but yet note that it was accepted as an ample basis for a number of professional gentlemen to resolve on attacking the well-recognised practice of one of their number. But there is the statement of Mr. E. Corbett, speaking not only as an architect desiring competition, but as an agent of the Bute estate, and who is stated to have told the meeting, in respect to the Park Place site, that "the land was let or sold to the Corporation with a condition that the design for the new building should be the result of open competition." There is here some extraordinary mistake. I know the agreement well—officially, indeed, for I have acted as surveyor on behalf of the Corporation in respect to it—and I say unhesitatingly that there is no such condition in it, nor indeed any reference whatever to the question of architect suggesting such an interpretation. Further, I feel convinced that the Corporation of Cardiff would not have accepted such a condition in their agreement.

Now, I would ask Mr. Vaughan seriously, Ought these bases, each containing plenty of opportunity for error or misunderstanding, to have been accepted by a meeting of gentlemen as sound and business-like causes of action at a moment when they were dealing with a matter so closely affecting the professional status of a colleague? And should these have been sufficient to prompt them to at once cast aside as unworthy of acceptance that colleague's written assurances?

I will only refer to Mr. Vaughan's strictures referring to my

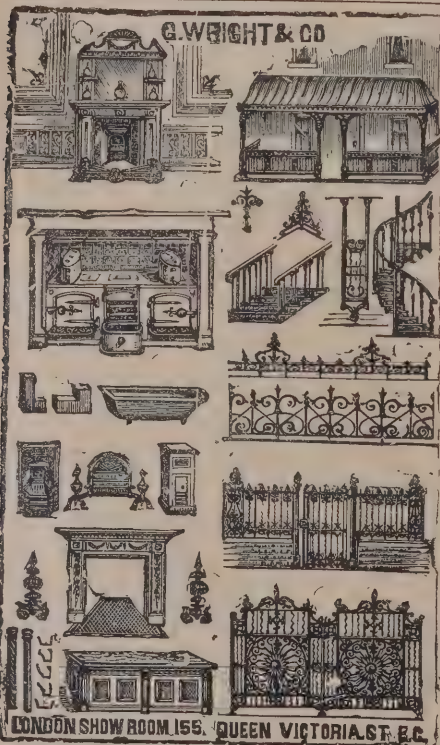
complaint against acts of individual architects by reminding him that he has pressed me (and still presses me) to meet the Society of Architects to discuss this business with them; that it is, therefore, necessary for me to thus declare that certain of those whom he would claim to put in the position of discussing my matter with impartiality cannot by any possibility do so. I have consistently, from the first moment, found myself unable to recognise that the architects have any place whatever in this matter, until they may possibly be officially called in. Any other attitude on my part would be merely weakness, and I look to the authorities alone for some issue to the present conditions.

But let me reciprocate with every sincerity Mr. Vaughan's personal expression of friendliness. So far as he is concerned, I accept as sufficient and satisfactory his statement that certain facts alone (which he names) constitute a sufficient ground for his abstaining from interference with my claims. His attitude as a professional man has not in years past and would not cause me any anxiety in respect to points of fairness and professional etiquette. I congratulate him on the excellent show he has at length made for the other side, and I sincerely hope his year of office will yet yield some case more worthy of the chivalrous spirit in which he has set himself to obliterate the blemishes in this one.—I am, &c.,

Cardiff: March 4.

EDWIN SEWARD.

My dear Seward,—Your letter in to-day's *Mail* and yesterday's *Evening Express* is a reply to mine of the 2nd inst., and I am presumably expected to answer it. I may say at once that I quite agree with you in saying that "the publicity of January 25 was a good thing," and that "the publicity of March and February is bad, very bad." The publication of such a resolution as the Society passed on January 24 was a legitimate subject for publication, for it dealt with a public question, viz. the proposed museum and art gallery in Park Place. The error into which you have fallen from the first, and which you are so persistent in proclaiming, is the idea that we were by that resolution interfering with you personally in "your business affairs," "attacking the well-recognised practice of one of your number," "attempting to deprive you of an honourably acquired engagement," &c. No such ideas as these ever entered our minds, and that is amply borne out by the first part of the resolution, viz. "That unless they have already pledged themselves to any architect." This certainly covered your claim to act as the committee's architect, and if



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you had no claim and as we were led to believe would be the case, a competition advertised then, at any rate, we did, by the latter part of the resolution, what I know and feel would be your desire and have your sanction. We asked the committee that the competition should be open and conducted on the lines laid down in the suggestions of the Royal Institute of British Architects. But the publicity given to your letter of February 21 and that of the 1st inst. is quite another thing, and to quote you again, "Bad, very bad," and for this publicity you are entirely responsible. You sent or caused the representatives of the Press to be sent here to interview me, and on my refusing at their suggestions to give them a copy of your letter of the 21st ult., they told me whether I gave them a copy or not it would appear in their respective papers next morning, and as no one but myself had seen that copy of your letter it was evident to me that you had given copies to each paper; and this action of yours forced me, very reluctantly, to give them an account of our meeting; and further, I had scarcely read your letter of the 1st inst. before I read it in the *Express*, and the first and only letter I have sent to the Press on this subject is that of the 2nd inst., in which I endeavoured to give a plain unvarnished tale of the whole course of our proceedings.

I have already given my reason in public for not reading your letter of the 21st ult. at the annual dinner. It would have been quite out of place and character with that gathering to have even introduced a mere suggestion of your reason for staying away, and I believe I was perfectly justified in suppressing, to use your word, that letter on such an occasion. But of the fate of your letter to Mr. Coates Carter, dated January 24, I am not quite so certain. I am almost positive I did read that letter to the meeting myself, and if it was not read it was entirely my fault. But I will allow Mr. Edwin Corbett to answer another question of yours, and at the same time to correct an error of mine:—

[COPY.]

Castle Street, Cardiff: February 23, 1895.

Dear Vaughan,—I am very sorry to see in this morning's print that Mr. Seward has thought it proper to send his letter to the papers. I am taking the liberty of writing to say I entirely agree with the line you have taken, and shall be pleased to attend a meeting of the Society with the object of trying to convince Mr. Seward that no one in the Society wishes to prejudice him in any way. I do not know if by

what I said I left a wrong impression on your mind, or whether you are wrongly reported; but no condition was made when the land was let that the design should be by competition. I asked the members of the committee who saw me as a personal favour that it should be so, and strongly urged it—of course, without the least idea that Mr. Seward considered he had any claim to the work. There is no necessity to correct this in the Press, as the less public correspondence there is on what is really only a personal matter the better.—Yours faithfully,

EDWIN CORBETT.

There is only one other point to refer to in this last letter of yours and I have done. You have spoken of my suggestion that you should meet the Society as an inconsistent one. To quote you once more, "Your inconsistent suggestion that I should discuss my business affairs with gentlemen who are concerned in an attempt to deprive me of an honourably acquired engagement." You have acquitted me personally of this serious charge and I thank you for it, but you still hold my colleagues guilty. The age of chivalry is not over, and as I have undertaken a very thankless and unprofitable task, I may say, in their defence, it is not so long ago that you came to us and told us that some of the members of the old free library committee intended to deal unfairly with you with regard to the extension of the present building. But what did we do then? We knew that you had a decided claim—a strong one from a professional point of view—to act as their architect, and we supported you in it and readily consented to sign a memorial in your favour. And I will ask you to believe that the same spirit of fairness and justice and right professional dealing which characterised our conduct then has guided us in this matter all through, and will characterise our conduct in the future, and it is in this spirit I ask you once more to meet us to discuss this question in the proper place and not in the public Press.—Believe me, very faithfully yours,

(Signed) E. M. BRUCE-VAUGHAN.

Edwin Seward, Esq., F.R.I.B.A.,
Cardiff: March 6.

Sir,—A desire to close this correspondence (at least until matters progress) must be my excuse for brevity respecting the letter from Mr. E. M. B. Vaughan in the *Evening Express* this evening. The Architects' Society first gave the public one part of a case. I have, therefore, aided in ventilating a further necessary part. Having already spoken of Mr. Vaughan's thankless tasks, and accepted his candid admissions,



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why need I say more? His points are previously covered except one; on that one I gladly express appreciation of the fair professional attitude of Mr. Vaughan and some other local architects in reference to the free library building in 1890, and I believe he would admit that there has been occasion since when he did not find me forgetful of it. The sharp and unnecessary contrast between the architects' action in 1890 and 1895 is responsible for this correspondence.—I am, &c.,

EDWIN SEWARD.

THE NEW FACTORIES AND WORKSHOPS BILL.

THE following are among the provisions of the Bill which is now before the House of Commons:—

Sanitary Provisions and Safety.

A factory shall for the purpose of section 3 of the principal Act, and a workshop shall for the purpose of the law relating to public health, be deemed to be so overcrowded as to be dangerous or injurious to the health of the persons employed therein, if the number of cubic feet of space in any room therein bears to the number of persons employed at once in the room a proportion less than 250, or during any period of overtime 400 cubic feet of space to every person.

Provided that the Secretary of State may, by order made in accordance with section 65 of the principal Act, modify this proportion for any period during which artificial light is employed, and may by like order, as regards any particular manufacturing process or handicraft, substitute for the said figures of 250 and 400 respectively any higher figures, and thereupon this section shall have effect as modified by the order.

A court of summary jurisdiction may, on complaint by an inspector, and on being satisfied that any place used as a factory or workshop or as part of a factory or workshop is in such a condition that any manufacturing process or handicraft carried on therein cannot be so carried on without danger to health or to life or limb, by order prohibit the place from being used for the purpose of that process or handicraft, until such works have been executed as are in the opinion of the court necessary to remove the danger.

If an inspector gives notice in writing to the occupier of a factory or workshop that any place in which work is carried on for the purpose of or in connection with the business of the factory or workshop is injurious or dangerous to the health of

the persons employed therein, then if the occupier, after the expiration of one month from receipt of the notice, gives out work to be done in that place, and the place is found to be so injurious or dangerous, he shall be liable, on summary conviction, to a fine not exceeding twenty pounds.

The traversing-carriage of any self-acting machine erected after the commencement of this Act in a factory shall not be allowed to run out within a distance of 18 inches from any fixed structure not being part of the machine, if the space over which it so runs out is a space over which any person is liable to pass, whether in the course of his employment or otherwise.

Provided that if the machine is on the same site as and is substituted for a similar machine existing before the commencement of this Act, the existing distance, if less than 18 inches, shall for the purposes of this section be substituted for the said distance of 18 inches.

Where any matter in difference is referred to arbitration under section 8 of the Act of 1891, the arbitrators or umpire may, on the application of any of the workmen employed in the class of employment to which the arbitration relates, and on such security, if any, as may appear to the arbitrators or umpire sufficient to provide for the costs of and consequential on the application, appoint any person to represent the workmen, or any class of them, on the arbitration, and any person so appointed shall be entitled to attend and take part in the proceedings of the arbitration to such an extent and in such manner as the arbitrators or umpire may direct, and shall be subject to the same liability with respect to costs as if he were a party to the arbitration.

Section 82 of the principal Act, which provides penal compensation to persons injured by neglect to fence machinery, shall extend to any death or bodily injury or injury to health in consequence of the occupier of a factory or workshop having neglected to observe any provision of the Factory Acts or any special rule or requirement made in pursuance of the Act of 1891.

Special Rules and Requirements.—Laundries.

1. The Factory Acts shall apply to every laundry which is carried on by way of trade or for purposes of gain:—

(i.) If steam, water, or other mechanical power is used in aid of the laundry process, as if the laundry were a non-textile factory; and

(ii.) In any other case, as if the laundry were a workshop.

2. In the case of every laundry worked by steam, water or other mechanical power.

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(a) A fan or other means of a proper construction shall be provided, maintained and used for regulating the temperature in every ironing-room, and for carrying away the steam in every washhouse in the laundry; and

(b) All stoves for heating irons shall be sufficiently separated from any ironing-room, and gas irons emitting any noxious fumes shall not be used; and

(c) The flooring shall be kept in good condition, and drained in such a manner as will allow the water to flow off freely.

A laundry in which these provisions are contravened shall be deemed to be a factory not kept in conformity with the principal Act.

3. Nothing in this section shall apply to any laundry in which the only persons employed are members of the same family dwelling there.

4. The exception created by section 53 of the principal Act with respect to overtime shall apply to laundries.

Docks, Building Works, &c.

1. The following provisions of the principal Act, as amended by subsequent enactments, including this Act, namely:—

(i.) Sections 5 and 82, with respect to the fencing of machinery;

(ii.) Section 31, with respect to notice of accidents; and

(iii.) Section 68, with respect to the powers of inspectors; and the provisions of this Act with respect to the register of accidents and the formal investigation of accidents, shall have effect as if—

(a) Every dock, wharf, quay and warehouse, and

(b) Any premises on which machinery worked by steam, water or other mechanical power is temporarily used for the purpose of the construction of a building or any structural work in connection with a building, were included in the word factory, and the purpose for which the machinery is used were a manufacturing process, and as if the person who by himself, his agents or workmen temporarily uses any such machinery for the before-mentioned purpose were the occupier of the said premises; and for the purpose of the enforcement of those sections the occupier of a dock, wharf, quay or warehouse, and the person so using any such machinery, shall be deemed to be the occupier of a factory.

Tenement Factories.

Where mechanical power is supplied to different parts of the same building occupied by different persons for the purpose

of any manufacturing process or handicraft in such manner that those parts constitute in law separate factories, the owner (whether or not he is one of the persons so in occupation) of the building (which building is hereafter in this Act referred to as a tenement factory) shall, instead of the occupier, be liable for the observance, and punishable for non-observance, of the following provisions, namely:—

(a) Section 3 of the principal Act, with respect to the sanitary condition of a factory; and

(b) Sections 5 and 82 of the principal Act, with respect to the fencing of machinery in a factory, except so far as those sections relate to such parts of the machinery as are supplied by the occupier; and

(c) Section 19 of the principal Act, with respect to the notices to be affixed in a factory and the matters to be specified therein; and

(d) Section 33 of the principal Act, with respect to the limewashing and washing of the interior of a factory, so far as it relates to any engine-house, passage or staircase, or to any room which is let to more than one tenant; and

(e) Section 36 of the principal Act, with respect to the removal of dust, so far as that section requires the supply of pipes or other contrivances necessary for working the fan or other means for that purpose; and

(f) Section 78 of the principal Act, with respect to the affixing of an abstract and notices.

In a tenement factory the period and times specified in the notice affixed in accordance with Section 19 of the principal Act shall apply to all the factories in the building, except so far as they may be modified for any particular factory in the building by a special notice in the prescribed form affixed in that factory by the occupier thereof.

Sections 8 to 11 of the Act of 1891 shall, if and as far as in the case of a tenement factory the Secretary of State by order so directs, apply as if the owner of the factory were substituted for the occupier.

The provisions of this Act with respect to the power to make orders in the case of dangerous premises shall apply in the case of a tenement factory as if the owner were substituted for the occupier.

Where, by or under this section, the owner of a tenement factory is substituted for the occupier with respect to any provisions of the Factory Acts, any summons, notice or proceeding which for the purpose of any of those provisions is by the said Acts or any of them authorised or required to be served



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on or taken in relation to the occupier, is hereby authorised or required (as the case may be) to be served on or taken in relation to the owner.

For the purpose of the provisions of this Act with respect to tenement factories, all buildings situate within the same close or curtilage shall be treated as one building.

Where grinding is carried on in a tenement factory, the owner of the factory shall be responsible for the observance of the regulations set forth in the first schedule to this Act.

In every such tenement factory it shall be the duty of the owner and of the occupier of the factory respectively to see that such parts of the horsing chains and of the hooks to which the chains are attached as are supplied by them respectively are kept in efficient condition.

In every tenement factory where grinding or cutlery is carried on the owner of the factory shall provide that there shall at all times be instantaneous communication between each of the rooms in which the work is carried on and both the engine-room and the boiler-house.

A tenement factory in which there is any contravention of this section shall be deemed not to be kept in conformity with the principal Act, but for the purposes of any proceeding in respect of a provision for the observance of which the owner of the factory is responsible, that owner shall be substituted for the occupier of the factory.

Regulations as to Grinding in Tenement Factory.

1. Boards to fence the shafting and pulleys, locally known as drum boards, shall be provided and kept in proper repair.
2. Hand rails shall be fixed over the drums and kept in proper repair.
3. Belt guards, locally known as scotchmen, shall be provided and kept in proper repair.
4. Every floor which is constructed after the commencement of this Act shall be so constructed and maintained as to facilitate the removal of slush, and all necessary shoots, pits and other conveniences shall be provided for facilitating such removal.
5. All existing floors shall be kept clean of accumulations of mud and slush.
6. Every grinding-room or hull which is established after the commencement of this Act shall be so constructed that for the purpose of light grinding there shall be a clear space of 3 feet at least between each pair of troughs, and for the purpose

of heavy grinding there shall be a clear space of 4 feet at least between each pair of troughs, and 6 feet at least in front of each trough.

7. The sides of all drums in every grinding-room or hull shall be closely fenced.

8. No grindstone shall be run before any fireplace.

9. No grindstone erected after the commencement of this Act shall be run before any fireplace or before any door or other entrance.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

3971. Charles Thomas Young, for "Improvements in tiles for copings, conduits, drains and the like."

4048. Gustav von Breymann Schwertenberg, for "Improved portable solid structures or blocks for building purposes."

4109. Christopher Allen Davenish, for "Improvements in or relating to windows, doors and the like."

4137. Alfred Earp Jones, for "Improvements in temporary scaffolding for painting walls, cleaning windows and the like."

4171. William Metcalfe, for "Improvements in fasteners for sashes, doors and the like."

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There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

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COMPETITIONS OPEN.

DURHAM.—March 25.—Competitive Schemes are Invited for the Sewage Disposal of the District. Premiums 100l. and 50l. for Two Best Schemes. Mr. F. Marshall, Town Clerk, Durham.

IPSWICH.—March 25.—Designs are Invited for the Building of a Workhouse and Infirmary, with Specifications and Estimate. Premiums 100l. and 50l. Mr. A. F. Vulliamy, Clerk to the Guardians.

CONTRACTS OPEN.

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ABERTILLERY.—March 30.—For Construction of Reservoir, Filter Beds, &c. Mr. Togarmah Rees, Engineer, Corn Exchange Chambers, Newport, Mon.

ACCRINGTON.—April 3.—For Seating Fittings, &c., for Technical School. Mr. Henry Ross, Architect, 15 Cannon Street, Accrington.

ACTON.—April 2.—For the Construction of a Sewer. Mr. D. J. Ebbetts, 242 High Street, Acton.

BACUP.—April 3.—For Building Municipal Buildings. Mr. J. W. Beaumont, Architect, 10 St. James's Square, Manchester.

BARNET.—March 27.—For Alterations at Workhouse. Mr. W. H. Mansbridge, 40 High Street, Barnet.

BATHAMPTON.—March 25.—For School Buildings. Mr. W. J. Wilcox, Architect, 1 Belmont, Bath.

BEDMINSTER.—March 25.—For School. Mr. E. Gabriel, Lucas Hall Chambers, Baldwin Street, Bristol.

BISHOPSTOKE.—March 30.—For Building Schools. Messrs. Cancellor & Hill, Architects, 14 Jewry Street, Winchester.

BLACKBURN.—March 29.—For Extension of Church Higher Grade Schools. Messrs. Stones & Gradwell, Architects, 10 Richmond Terrace, Blackburn.

BLANDFORD.—March 26.—For Erection of a New Chancel and Organ Chamber for Blandford Church. Mr. Chas. Hunt, Architect, Blandford.

BOURNEMOUTH.—March 28.—For Cricket Pavilion. Mr. F. W. Lacey, Borough Surveyor.

BRIDGWORTH.—March 25.—For Erection of an Infirmary. Mr. E. C. H. Maidman, 1 Comely Park Avenue, Edinburgh.

BROMLEY.—March 26.—For Supply of 1,200 Tons of Broken Granite, 300 Tons of Broken Quartzite, and 5,650 Cubic Yards of Surface Hand-picked Broken Flints. Mr. F. H. Norman, District Council Offices, Bromley, Kent.

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CHYANDOUR.—April 2.—For Building Police Station, &c. Mr. Oliver Caldwell, Architect, Victoria Square, Penzance.

CORK.—March 26.—For Building Large Warehouse. Mr. Robert Walker, Architect, 17 South Mall, Cork.

DERBY.—March 23.—For Building Infirmary Wards, &c. Messrs. Coulthurst & Booty, Architects, 4 Albert Street, Derby.

DORCHESTER.—March 22.—For Rebuilding Shops and Premises. Mr. Arthur Tilley, Architect, 16 Cornhill, Dorchester.

EAST GRINSTEAD.—April 2.—For the Erection of a Crown Post Office. Mr. Stephenson, 38 Parliament Street, S.W.

EDMONTON.—April 2.—For Erection of Schools. Messrs Young & Brown, 7 Southampton Street, W.C.

GRIMSBY.—March 29.—For Additions to Premises. Mr. D. Pick, Architect, 242 Cleethorpe Road, Grimsby.

HAIGH.—March 27.—For Supply of Cast-iron Water Mains (Six Miles). Messrs. Heaton & Ralph, Surveyors, King Street, Wigan.

HALIFAX.—March 25.—For Building Nine Houses. Mr. Medley Hall, Architect, 39 Northgate, Halifax.

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KING'S LYNN.—March 28.—For Erection of Municipal Buildings. Messrs. Philip Tree & Ivor Price, Architects, London Road, St. Leonards-on-Sea.

LONGRIDGE.—March 23.—For Building the Cave Memorial Infant School, Berry Lane. Mr. J. A. Seward, Architect, 16 Lune Street, Preston.

MARGATE.—March 25.—For Alterations and Additions to East Cliff House. Mr. Chas. J. Reeve, Grosvenor Place, Margate.

MELTON.—April 6.—For Providing and Sinking Two Cast-iron Cylinders at Asylum Waterworks. Messrs. George & Frederick W. Hodson, Abbey Buildings, Princess Street, Westminster.

MIDDLETON.—April 3.—For Supply of Cast-iron Manhole and Street Grids. Mr. F. Entwistle, Town Clerk, Middleton, Manchester.

NELSON.—March 25.—For River Walling, &c. Mr. J. W. Bradley, Borough Engineer.

NEWCASTLE-ON-TYNE.—April 3.—For Construction of Subway under Railway. Mr. Charles A. Harrison, Central Station, Newcastle-on-Tyne.

NEW WINDSOR.—April 4.—For Extension of Sewage Works. Mr. W. Menzies, Surbiton House, Englefield Green Surrey.

NORWICH.—April 2.—For Building Baths, Supply of Machinery, &c. Mr. Arthur E. Collins, City Engineer, Norwich.

PORTAFERRY.—March 25.—For Building Two Cottages. Mr. Wilson, Architect, 16 Waring Street, Belfast.

RUNCORN.—March 28.—For Furnishing Technical Institute. Mr. E. Marshall, Secretary, Town Hall, Runcorn.

SHEFFIELD.—March 30.—For Excavation and Construction of Concrete and Brick Foundation for New Buildings, Liquor Tank, &c. Mr. Fletcher W. Stevenson, Sheffield United Gas Light Co., Commercial Street, Sheffield.

SOUTHEND.—March 22.—For Erection of Sanatorium Building. Mr. W. Y. Hobbiss, Clarence Road, Southend.

STAINES.—March 26.—For Erection of Buildings in Kingston Road. Mr. Fitt, Town Hall, Staines.

STANSTEAD ABBOTTS.—April 1.—For Execution of Sewers and Other Works. Messrs. Bailey, Denton, Son & North, Palace Chambers, Westminster.

STOCKPORT.—March 27.—For Building Workshops and Stores for the Gas Committee. Mr. S. Meunier, Millgate Works, Stockport.

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THORPE.—March 29.—For the Removal of Mud from the Old River. Mr. H. T. Cole, 67 London Road, Norwich.

TOTTENHAM.—March 26.—For Supplying and Laying 1,650 Yards Tooled and Squared Hard York Paving. Mr. P. E. Murphy, 712 High Road, Tottenham.

WARRINGTON.—March 25.—For Erection of Shed and Modelling Room at Museum. Mr. T. Longdin, Borough Surveyor.

WEST HAM.—March 26.—For a Twelve H.P. Portable Steam Engine. Mr. Lewis Angell, Town Hall, Stratford, E.

WEST HAM.—March 26.—For the Supply of 66,000 Bricks, 1,400 Yards York Paving and 678 Feet of York Coping. Mr. Lewis Angell, Town Hall, Stratford, E.

WILLESDEN.—March 26.—For Construction of 4,000 Lineal Yards of Pipe Sewers, Manholes, &c. Mr. O. Claude Robson, Public Offices, Dyne Road, Willesden.

WIMBLEDON.—April 2.—For Construction of 390 Feet of 3-feet 6-inch Culvert and 1,066 Feet of 4-feet Culvert, with Manholes, &c. Mr. C. H. Cooper, A.M.I.C.E., The Broadway, Wimbledon.

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WOOD GREEN.—March 29.—For Supply of Gravel, Hogging, Ballast, Flints, Brick Rubbish, Sand and Stoneware Pipes. Mr. C. J. Gunyon, Town Hall, Wood Green, N.

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J. Hek, Aberdare	376	8	3
Batchelor & Snowdon, Cardiff	346	0	0
LLOYD & POWELL, Pontypridd (accepted)	314	10	0
Surveyor's estimate	358	0	0

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Arrol's Bridge and Roof Company, Limited, Glasgow	2,400	0	0
E. Manisty, Dundalk	2,050	0	0
J. ALLEN, Moy (accepted)	1,800	0	0
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Somervail & Co., Dalmauir	1,700	0	0
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Waterside Ironworks Co, Dukinfield	617	4	6
Thornton & Crebbin, Bradford	572	15	3
Cochrane & Co, Dudley	560	5	4
Stanton Ironworks Co, Nottingham	560	0	0
Clapham Bros., Keighley	556	8	9
J. Wolstenholme, Radcliffe	554	14	6
Blakeborough & Sons, Brighouse	509	9	0
G. Waller & Co., London	495	0	5
T. & D. Mills, Heywood	494	10	9
Glenfield Co., Kilmarnock	490	8	8
E. & W. H. Haley, Bradford	470	6	7
Woodward & Ashworth, Manchester	471	16	0
Goodwin, Barsby & Co., Leicester	467	1	4
Sharpe & Co., Lancaster	459	19	6
Goddard, Massey & Warner, Nottingham	459	0	0
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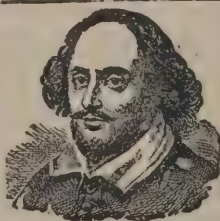
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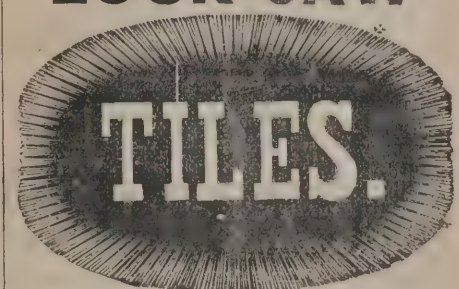
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T. & W. Meadows, Stockport	7,660	3	0
Etheridge & Clark, Manchester	7,614	10	0
Freeman & Sons, Oldham	7,604	0	8
R. Lomax, Eccles	6,721	15	2
J. Ainscouth, Oldham	6,649	0	9
J. D. Nowell, Stretford, Manchester	6,434	10	3
W. UNDERWOOD & BRO., Dunkinfield (<i>accepted</i>)	6,084	13	6
E. Tempest, Stafford (<i>withdrawn</i>)	5,287	14	2

BRADFORD.

For Building House, Coach-house, Stabling, &c, Idle Road, Bradford. Mr. J. H. DIXON, Architect, 90 Heap Lane, Bradford.

Accepted Tenders.

W. North, Idle, mason.
W. Kellet, Bradford, joiner.
J. R. Watson, Bradford, plumber.
A. Taylor, Eccleshill, plasterer.
Thornton Bros., Otley, slater.
Total of Tenders, £1,115.

BRENTFORD.

For Erection of Two Bathrooms and Other Works at their Isolation Hospital, Claypolds Lane, for the Brentford Urban District Council. Mr. NOWELL PARR, Surveyor, Clifden House, Boston Road, Brentford.

W. Barrett, Brentford	£280	0	0
J. Bloomer, Brentford	249	10	0
Food & Sons, Brentford	249	0	0
J. BARNES, Brentford (<i>accepted</i>)	240	0	0
J. E. Broderick, Richmond	239	0	0

For Alterations and Additions to the Old Bank, High Street, for Messrs. Woodbridge, Lacy, Hartland, Hibbert & Co. Mr. S. WOODBRIDGE, jun., Architect and Surveyor, Brentford.

Food & Sons	£160	0	0
J. Barnes	130	12	0
J. BLOOMER, Brentford (<i>accepted</i>)	125	0	0

CHIEVELEY.

For Rebuilding Stabling, &c., at the Hare and Hounds, Chieveley, for Mr. H. J. Finn. Mr. WALTER HENRY BELL, Architect, Market Place, Newbury.

E. James, Newbury	£208	0	0
C. Wicks, Stockcross, Newbury	207	12	0
T. Taylor, Newbury	196	10	0
J. TARRANT, Newbury (<i>accepted</i>)	185	10	0

DARWEN.

For Erection of Eight Houses off Equity Street, for the Darwen Industrial Co-operative Society, Limited. Mr. JOHN B. THORNLEY, Architect, 45 Market Street, Darwen.

R. THORROCK, Darwen (<i>accepted</i>)	£1,690	0	0
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DEVONPORT.

For Alterations and Additions to the Terminus Hotel, for the Plymouth Breweries Company. Mr. H. G. LUFF, A.R.I.B.A., Architect, 64 Chapel Street, Devonport.

T. Crews, Stonehouse	£716	10	0
Jenkin & Son, Devonport	631	8	0
W. Littleton, Devonport	510	0	0
T. Taylor & Son, Stonehouse	505	0	0
T. GREENSLADE & SON, Devonport (<i>accepted</i>)	495	10	0

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ENFIELD.

For Building Residence, Wellington Road, Bush Hill Park, Enfield, for Mr. M. Buttfield. Mr. T. POTTER, Architect, Sevenoaks.		
Cordell	£1,196	0 0
Patman	1,195	0 0
Fairhead	1,181	0 0
Brown	1,178	0 0
White	1,153	0 0
Morrison	1,256	0 0
Gogg	1,224	0 0
P. HART, West Green and Bush Hill Park (accepted)	1,120	0 0

GUILDFORD.

For Draining, Levelling and Making-up Sandfield Terrace, for the Corporation. Mr. F. T. MALBY, Borough Surveyor.		
G. A. Franks, Guildford	£261	12 0
S. Kavanagh, Tolworth, Surbiton (accepted)	237	17 2
Borough Surveyor's estimate	235	0 0

HARPERLEY.

For Considerable Alterations and Additions to Harperley Hall, Harperley, Darlington. Messrs. F. CLARK, F.R.I.B.A., & W. J. MOSCROP, F.R.I.B.A., Architects, Feethams, Darlington.		
JOHNSON & HANBY, Stockton-on-Tees (accepted)		

HARWICH.

For the Erection of Infant School, Boundary Walls, W.C.s, &c., at Lower Dovercourt, for the Harwich School Board. Mr. J. W. START, F.S.I., Architect, Colchester, Clacton-on-Sea, and Harwich. Quantities by Architect.		
Girling & Co., Ipswich	£1,950	0 0
G. Dobson, Colchester	1,885	0 0
Smith, Beaumont & Dawson, Harwich	1,863	18 0
E. West, Chelmsford	1,700	0 0
R. Beaumont, Lexden	1,695	0 0
Morgan & Son, Harwich	1,590	0 0
E. SAUNDERS, Dovercourt (accepted)	1,477	0 0
Extra for glazed-brick dado to Lavatory and match-boarded dado to Schools, 32l. 18s. 6d.		

HULL.

For Building Shops, Houses, &c, Holderness Road, Hull. Mr. GEO. S. HIRD, Architect. Quantities by Architect.		
Hewitt, Hull	£1,246	14 8
Hodgson, Hull	1,052	0 0
Nicholson, Hull	1,053	17 8
T. Goates, Hull	1,050	0 0
Harper, Hull	1,046	0 0
A. J. Darnley & Son, Hull	1,034	11 0
Sayner, Hull	1,025	12 0
Scott, Hull	996	14 6
Hocking & Siggins, Hull	990	0 0
Colley & Swilt, Hull	982	15 0
Woods, Hull	944	0 0
SINGLETON, Hull (accepted)	903	4 6

KIRKBY STEPHEN.

For Additions and Alterations to Eden Place, Kirkby Stephen, for Lieut.-Colonel Mason, J.P. Mr. ROBERT WALKER, Architect, Windermere and Lancaster.		
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Accepted Tenders.

Harrison, Kirkby, mason.		
Smith & Bonson, Kirkby, joiner.		
F. Thornton, Kirkby, plumber.		
C. Armstrong, Kirkby, plasterer.		
Brunskill & Nicholson, Kirkby, painting, &c.		
J. Bailey, Penrith, slater.		

LEYTONSTONE.

For Erection of the Fillebrook Livery Stables and Coachhouses, Grove Green Lane, for Mr. James Powell. Mr. J. WILLIAMS DUNFORD, F.I.Inst., Architect, 10cc Queen Victoria Street, E.C.		
F. J. Coxhead	£1,285	0 0
Fuller & Son	1,187	0 0
Smith & Co.	1,167	0 0
E. Good	1,086	0 0
A. G. BARTON, Walthamstow (accepted)	1,003	0 0
Architect's estimate	1,015	0 0

LONDON.

For Alterations to 2A Grand Parade, Finchley Road, for Lloyds Bank. Mr. HORACE FIELD, Architect.		
H. G. DAVENALL, Gospel Oak (accepted)	£595	0 0

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LONDON—continued.

For External Painting and Repairs Required to be done at the Licensed Victuallers' Asylum, Asylum Road, Old Kent Road. Mr. W. F. POTTER, Architect. Quantities prepared by Mr. C. R. GRIFFITHS, 31 Fumival Street, Holborn, E.C.

W. H. Collings & Co, Old Street	£1,049	0	0
W. Smith, Kennington	821	0	0
J. Walker, Poplar	694	0	0
F. Dawes, Peckham Rye	595	0	0
Pritchard & Renwick, Southwark	570	0	0
H. H. Hollingsworth, Peckham	559	0	0
S. HAYWORTH & SONS, Kingsland (accepted)	497	0	0

For Building Newington Public Baths and Washhouses, Manor Place, Walworth. Mr. E. B. PANSON, Architect, 7A Laurence Pountney Hill, E.C. Quantities by Messrs. BATSTONE BROS., 110 Cannon Street, E.C.

1. Tyerman	£28,000	0	0
Prestige & Co.	27,924	0	0
Rider & Sons	27,820	0	0
H. Lovatt	27,750	0	0
Godson & Sons	27,681	0	0
Colls & Son	27,564	0	0
Mowlem & Co.	27,460	0	0
Bell & Gash	27,248	0	0
W. H. Lorden	27,000	0	0
E. J. Saunders	27,000	0	0
Burman & Sons	26,700	0	0
Smith	26,698	0	0
D. Charteris	26,567	0	0
Allen & Sons	26,349	0	0
J. Carmichael	26,290	0	0
Shillitoe & Sons	26,250	0	0
W. Wallis	25,728	0	0
Johnson & Co., Limited	25,653	0	0
Kirk & Randall	25,606	0	0
Grover & Sons	25,384	0	0
Laurence & Sons	25,346	0	0
J. Marsland	24,945	0	0
Treasure	24,914	0	0
B. Nightingale	24,933	0	0
Patman & Fotheringham	24,871	0	0
H. L. Holloway	24,440	0	0
G. Grey Hill	24,490	0	0
BALAAM BROS. (accepted)	24,383	0	0

LONDON—continued.

For Setting Boilers, &c.

Burman & Sons	£700	0	0
J. Marsland	645	0	0
Bell & Gash	600	0	0
Godson & Sons	587	0	0
Prestige & Co.	570	0	0
Smith	559	0	0
Grover & Sons	553	0	0
I. Tyerman	550	0	0
W. H. Lorden	550	0	0
H. L. Holloway	550	0	0
W. Wallis	548	0	0
Johnson & Co., Limited	546	0	0
Colls & Son	545	0	0
Kirk & Randall	544	0	0
H. Lovatt	535	0	0
BALAAM BROS. (accepted)	533	0	0
D. Charteris	527	0	0
J. Carmichael	520	0	0
Laurence & Sons	520	0	0
Allen & Sons	502	0	0
E. J. Saunders	500	0	0
Shillitoe & Sons	500	0	0
Rider & Sons	495	0	0
Treasure	490	0	0
Patman & Fotheringham	480	0	0
Mowlem & Co.	470	0	0
G. Grey Hill	456	0	0
B. Nightingale	443	0	0

For Making-up and Paving Burnfoot Avenue, Section I., Fulham, for the Fulham Vestry. Mr. CHARLES BOTTERILL, Surveyor.

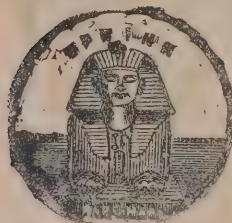
Greenham, Hammersmith	£190	0	0
Nowell & Robson, Kensington	176	0	0
Mears, Kensington	155	0	0

Nowell & Robson	136	0	0
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Victoria Stone Co., Kingsland	110	0	0
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Imperial Stone Co., East Greenwich	99	0	0
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LONDON—continued.

For Supply of a New Sludge-loading Pipe, &c., at Barking Outfall Works, for the County Council.			
Thames Ironworks Company, Limited	£2,007	8	2
R. Moreland & Son	1,830	0	0
Phoenix Foundry Company, Limited	1,586	6	1
Glenfield Company, Limited	1,577	3	6
J. Lysaght, Limited	1,374	13	6

For Erection of a Block of School Buildings to be known as Water Lane Schools, on a Site at Stratford, for the West Ham School Bord. Messrs. J. T. NEWMAN & JACQUES, Architects, 2 Fen Court, Fenchurch Street, E.C.

J. Potter, Horsham	£22,765	0	0
Stimpson & Co., Brompton Road	19,900	0	0
H. J. Carter, Grays	19,218	0	0
C. G. Hill, Coventry	18,880	0	0
Lorden & Son, Upper Tooting	18,489	0	0
Hearle & Farrow, London	18,125	0	0
Reed & Son, Stratford	17,996	0	0
Girling & Coe, Ipswich	17,841	0	0
W. J. Maddison, Canning Town	17,534	0	0
GREGAR & SON, Stratford (accepted)	17,320	0	0
Kirk, Knight & Co., Sleaford	17,100	0	0

For Building Factory Shed in Rear of 85, 87 and 89 Vauxhall Walk, and Warehouse, 97 Vauxhall Walk. Mr. J. A. J. WOODWARD, Architect, 60 Kennington Oval. Quantities by Mr. W. H. WOODWARD.

<i>Factory.</i>			
Maides & Harper	£1,508	0	0
Nightingale	1,434	0	0
Parsons	1,397	0	0
Whitehead	1,380	0	0
Long	1,358	0	0
T. Hooper	1,335	0	0
J. Marsland	1,292	0	0

<i>Warehouse.</i>			
Maides & Harper	2,436	0	0
Parsons	2,244	0	0
Long	2,162	0	0
Whitehead	2,130	0	0
T. Hooper	2,114	0	0
Nightingale	2,106	0	0
J. Marsland	1,995	0	0

LONDON—continued.

For Enlargement of the Clerkenwell Fire Brigade Station, for the County Council.

J. Shillitoe & Son	£8,163	0	0
Thompson & Beveridge	7,245	0	0
F. Lough & Co.	7,194	0	0
Holloway Bros.	6,857	0	0
G. Munday & Son	6,696	0	0

MIDDLEWICH.

For Large Reservoir, Finding and Laying 142 Lineal Yards 15-inch Iron Pipe, 142 Lineal Yards 12-inch Iron Pipe, 132 Lineal Yards 10-inch Iron Pipe, with Valves, &c., Complete, for the Anglo-Swiss Condensed Milk Company, Middlewich. Mr. T. WORTH, Surveyor.

Pickin, Davenham	£1,089	0	0
Ewart, Warrington	1,050	0	0
Beckett & Co., Hartford	1,068	0	0
F. Wilson & Co., Northwich	940	0	0
J. Dale, Northwich	897	16	9
S. Hutton, Altrincham	847	16	6

NOTTINGHAM.

For Building Police Station, Sergeant's House, Mortuary and Reading-room in Gregory Boulevard, for the Corporation. Mr. ARTHUR BROWN, Borough Engineer.

T. Cuthbert, Nottingham	£6,900	0	0
J. Hodson & Son, Nottingham	6,862	0	0
W. Gell & Son, Nottingham	6,775	0	0
A. G. Bell, Nottingham	6,737	10	0
Gilbert & Gabbitass, Nottingham	6,660	0	0
J. J. ADAMS, Nottingham (accepted)	6,600	0	0
F. Messom, Nottingham (withdrawn)	6,300	0	0

PLYMOUTH.

For Paving, &c., Vauxhall Quay, Sutton Wharf and North Quay. Mr. JAMES PATON, Borough Engineer.

Tozer & Son	£2,452	2	6
W. C. Shaddock	2,341	9	0
E. Duke	2,102	2	6
T. Shaddock	2,024	2	9
C. L. Duke	2,021	5	4

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PORTSMOUTH.

For Stores and Additions to Offices, for the Portsea Island Gas Light Company. Messrs. RAKE & COGSWELL, Architects, Portsmouth.

J. Croad	£1,130	0	0
Light & Son	1,117	0	0
W. Ward	1,099	0	0
H. Corke	1,075	0	0
H. Jones (late)	1,050	0	0
W. EVANS (accepted)	1,050	0	0

ROTHERHAM.

For Building Police Courts and Cells, for the Town Council.

R. SNELL, Rotherham (accepted)	£9,000	0	0
Tender from Arnold & Son, Doncaster, £8,785, withdrawn.			

SHEFFIELD.

For Additional Court, Magistrates' Room, Waiting-rooms, Offices and Cells, between Waingate and Castle Green, Sheffield, for the Watch Committee. Messrs. FLOCKTON & GIBBS, Architects, 15 St. James's Row, Sheffield.

Whole Tenders.

J. Morton	£16,917	0	0
T. Lowe & Sons, Burton-on-Trent	16,800	0	0
G. Longden & Son	16,200	0	0
F. Ives, Shipley	15,938	0	0
Ash, Son & Biggin	15,780	0	0

Accepted Tenders.

J. Fidler, Eckington, mason	8,895	0	0
J. H. Lillever, joiner	4,105	12	0
J. B. Corrie & Sons, plumber	1,120	10	0
Carter Bros. & Co., Manchester, ironfounder	788	0	0
C. Chadwick & Son, plasterer and slater	375	0	0

ST. AUSTELL.

For Additional Rooms to Sydenham Villa, St. Austell. Mr. TREVAIL, Architect, Truro.

T. J. Smith, St. Austell	£249	10	0
J. Colliver, Truro	207	0	0
J. JACOB, St. Austell, mason, bricklayer, slater and plasterer's work only (accepted)	135	0	0
J. F. Lakeman, St. Austell, carpenter, painter, plumber and smith's work only	110	0	0
W. H. SMITH, St. Austell, carpenter, joiner, painter and plumber's work only (accepted)	102	5	0

SOWERBY BRIDGE.

For Supplying and Fixing Oak Interior Fittings, for the Sowerby Bridge Branch of the Lancashire and Yorkshire Banking Company. Messrs. ETTLEY & GRAY, Architects. S. J. WARING & SONS, Manchester (accepted) £173 0 0.

SOUTHMOLTON.

For Rebuilding North Wing of Workhouse, for the Guardians. W. Sanders & Son, Southmolton £696 0 0. Parminster & Sillifant, Barnstaple 649 0 0. Comins & Cotty, Southmolton 620 0 0. BOWDEN & SILLIFANT, Southmolton (accepted) 599 0 0.

SOMERTON.

For Works to Somerton and District Waterworks. Mr. J. T. HAWKINS, Engineer. Quantities by Engineer.

Contract No. 1.—Constructive Works.

J. T. Price, Nottingham	£2,985	16	0
R. R. Facey, Taunton	2,179	5	8
H. Shardlow, Nottingham	2,145	0	0
T. Morse, Bristol	1,942	0	0
A. Poole, Ilminster	1,903	14	6
H. W. Pollard, Bridgwater	1,828	17	3
Barnes, Chaplin & Co., Cardiff	1,708	11	6
J. B. Petter, Yeovil	1,524	17	0
R. J. Stead, Glastonbury	1,467	0	0
H. Weldon, Birmingham	1,457	19	0
J. T. Welch, Bath	1,432	3	0
T. Lydford, Castle Cary	1,398	19	6
B. Cooke & Co., Battersea	1,357	9	3
Newman, Wincanton	1,355	2	8

Contract No. 2.—Pipes, &c., Pipelaying.

A. Williams & Co., London	4,464	14	1
Batchelor & Snowden, Cardiff	4,299	13	1
W. Sparrow, Martock	4,232	11	2
W. S. Shaddock, Plymouth	4,227	3	11
B. Cooke & Co.	4,074	0	9
Easton, Anderson & Goolden, London	4,028	17	9
Barnes, Chaplin & Co.	3,992	7	4
S. Havanah, Surbiton Hill	3,967	4	4
Hawking & Best, Teignmouth	3,903	15	0
J. B. Petter	3,791	17	3
J. Peattie, Oxford	3,782	13	8
J. T. Price	3,727	0	0

* Recommended for acceptance.

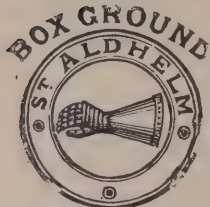
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WINTER
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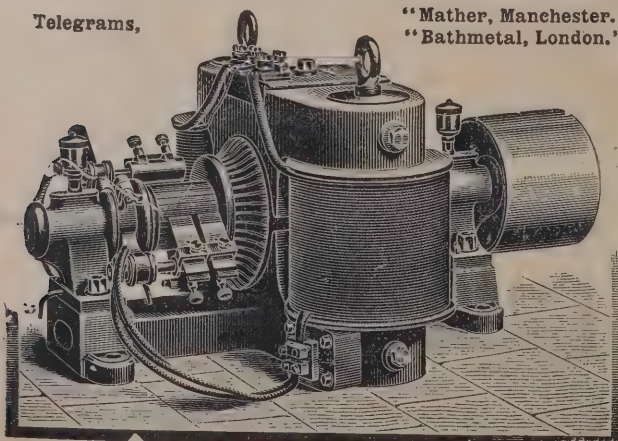
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SOMERTON—continued.

Contract No. 2.—Pipes, &c., Pipelaying—continued.

S. Havanah	£3,703	10	4
R. J. Stead	3,680	0	0
L. H. Green, Dartford	3,619	17	9
J. T. Welch	3,571	15	8
Gardner & Hopperfield, Cardiff	3,566	11	1
Bond & Hitchcock, Taunton	3,551	18	4
Staveley Coal and Iron Co., Chesterfield.	3,450	5	1
Bishop Bros., Wellington	3,442	16	10
W. H. Saunders & Co., Bournemouth	3,333	0	0
T. Morse	3,318	0	0
R. R. Facey	3,311	5	2
H. Shardlow	3,277	0	0
Smith & Marchant, Shepton Mallet	3,276	18	10
H. Weldon, Birmingham	3,235	14	3
Biggs, Wall & Co., London	3,215	6	6
Clay Cross Co., Chesterfield	3,175	7	4
H. W. Pollard	3,167	10	0
W. Newman	3,093	7	9
T. Lyford*	2,878	15	4
Engineer's estimate	3,276	14	0

Contract No. 3a.—Oil Engines and Pumping Plant.

	Single		Duplicate.
J. Warner	£545	10	0
J. Petter	500	16	8
Weyman & Hitchcock	500	4	4
Fleming & Fergusson	500	0	0
Easton, Anderson & Goolden			
(Crossley's engine)	499	10	6
Ditto (Hornsby's engine)	579	0	0
Coalbrookdale Co.	476	16	9
W. Sparrow	450	0	0
R. Warner	443	3	1
Stoddart & Pitt	433	11	0
Crossley Bros.*	419	10	0
Easton & Bessemer	410	0	0
Sibley & Son, Martock†	346	10	6

Thornton & Crebbin tendered for the whole at £844.

* Recommended for acceptance.

† If with Hornsby's engine and self-starter, £75 extra.

SOMERTON—continued.

Contract No. 3.—Engines and Gas Plant.

	Single.		Duplicate.
Easton, Anderson & Goolden			
(with Tangyes' engine)	£1,006	0	0
H. Shardlow	920	0	0
Clay, Henriques & Co.	913	13	6
Easton, Anderson & Goolden	863	0	0
G. Waller	862	8	0
Weyman & Hitchcock	845	9	0
Sibley & Son	843	19	6
W. Sparrow	798	0	0
Easton & Bessemer	730	6	10
Tangyes, Limited	672	10	0
Humpidge, Holboro & Co.	670	0	0
R. Warner & Co.	630	10	0
Stoddart & Pitt	578	0	0
Fielding & Platt	523	2	0
Coalbrookdale Company	514	15	3

Single and Duplicate.

Ferguson	£1,493	16	0
J. F. Price	1,200	0	0
J. Petter	1,000	0	0
Thornton & Crebbin	870	0	0
Crossley Bros.*	864	0	0

* Recommended for acceptance.

WELLS.

For Cottage Hospital, Wells. Mr. WILLIAM JOHN WILLCOX, Architect, Bath.

Bird, Radstock	£2,050	0	0
Forse, Bristol	1,998	0	0
Bray, Wells	1,998	0	0
Long & Sons, Bath	1,873	0	0
Cock & Ford, Wells	1,860	0	0
Francis, Castle Carey	1,800	0	0
Love, Bristol	1,799	0	0
Hayward & Wooster, Bath	1,797	0	0
Lovell & Sons, Bristol	1,796	15	0
Hatherly & Carr, Bristol	1,785	0	0
Huish, Street	1,782	16	9
S. Cook, Shepton Mallet	1,700	0	0
Merrick, Glastonbury	1,698	0	0
Stead, Glastonbury	1,687	0	0
WBathbell,	1,684	12	0

HEWETSONS, Tottenham LONDON, W.

Court Road, HOUSE FURNISHERS & DECORATORS.

CLUBS, HOTELS, &c.—DISMANTLING, CARPET-BEATING, &c.

HEWETSONS have always at hand a staff of steady and trustworthy men to send out to take up and relay carpets and entirely dismantle.

DECORATING.—HEWETSONS give ESTIMATES free of charge for PAINTING and all kinds of Interior Decorations, Structural Alterations, Sanitary Work, Electric Lighting, &c.

HUNTING AND SHOOTING BOXES completely Furnished at three days' notice for £150, £300, &c., and delivered carriage paid, to any railway station in Great Britain.

HEWETSONS' NEW ILLUSTRATED CATALOGUE is the best and most complete Furnishing Guide published, and is forwarded free of charge. It contains ESTIMATES for FURNISHING HOUSES for £150, £300 £500, £1,000, &c., each article in detail, illustrated and priced.

ARCHITECTS' Plans and Designs exactly and faithfully worked to.

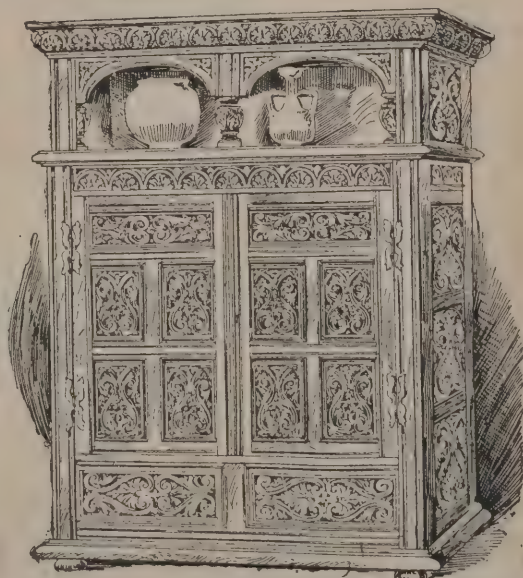
TENDERS FREE FOR ELECTRIC LIGHTING.

SANITARY Work, STRUCTURAL Alterations, and every kind of Interior and Exterior DECORATIONS.

N.B.—HOUSE AND ESTATE AGENCY OFFICES, 213 Tottenham Court Road.

SURVEYORS, AUCTIONEERS AND VALUERS.

HEWETSONS, TOTTENHAM COURT RD., LONDON, W.
CARVED OAK AND ANTIQUE DEPARTMENT, No. 204 TOTTENHAM COURT ROAD.



Replica of an OLD ENGLISH Carved Oak Hall Press, 16th century, 5 feet wide, 7 feet 6 inches high.

TWICKENHAM.

For Repairs and Decorations to Poulett Lodge, Cross Deep, Twickenham, for Mr. P. B. Burgoyne. Mr. WALTER J. EBBETTS, F.R.I.B.A., Architect, Savoy House, 115 Strand, W.C.

FOORD & SON, Brentford (accepted) £873 15 0

For Internal Sanitary Works.

FOORD & SON, Brentford (accepted) 125 12 0

For External Sanitary Works.

G. Jennings, Lambeth.

T. J. W. Messom, Twickenham.

FOORD & SON, Brentford (accepted) 191 0 0

WALTHAMSTOW.

For the Erection of Dwelling-house and Coach-building Premises, Markhouse Road. Mr. JASPER J. KELF, Architect, 26 High Street, Walthamstow.

Morrison & Goodwin, Southgate Road £661 0 0

Thompson, Leyton 640 0 0

Rawlins & Turner, Walthamstow 550 0 0

Dartnall Bros., Leytonstone 535 0 0

BURDOCK, Leyton (accepted) 533 15 0

TRADE NOTES.

WE give a list of buildings where Messrs. W. & R. Leggott, Silens Works, Bradford, and 226 High Holborn, London, have lately completed or are about to complete the work of fixing their fanlights and other gearing. They have also again succeeded in obtaining the contract for a term of years from the London School Board for the whole of the fanlight and other gearing in their schools. Brighton Public Baths, Buckingham Palace alterations, North-Western Fever Hospital, Hampstead; South-Eastern Fever Hospital, Old Kent Road, London; new disinfecter, Newington Vestry; London Hospital, Whitechapel; St. Luke's Union, administrative blocks, London; Fulham Union, administrative blocks; St. Olave's Grammar Schools, London Bridge; Ward's School, Thames Embankment, London; Guildhall School of Music, London; Goldsmiths' Institute, New Cross, London; Grocers' Company Hall, London; Bishops-gate Institute, London; Woolwich Public Baths; Bow Baths and Wash-houses, London; Barclay & Co.'s Bank, Cavendish

Square, London; Hong-Kong and Shanghai Banking Corporation, Lombard Street; Holloway's Sanatorium, Virginia Water; Reading Town Hall; Vaudeville Theatre, London; Reading Union; Tivoli Theatre, London; Public Library, Drury Lane; Central Hall, Holborn; New Admiralty Buildings; Drill Hall, S.T.H., Bow; Drill Hall, Bunhill Row, E.C.; Imperial Institute, Albert Gate; Hymers College, Hull; Aston Baths, Birmingham; Technical School, Gloucester; Cornwallis St. Baths, Liverpool; Soap Works, Port Sunlight; Dye Works, Apperley Bridge; New Baths, Farnworth, Lancashire; New Infirmary, Halifax; Yorkshire Penny Bank, Bradford; Craven Bank, Bradford; Lotherton Hall, near Saxton, Yorkshire; St. Ann's Church, Bishop Auckland, &c.

It may be of interest to note that the first hotel in Great Britain to adopt the use of electricity for driving elevators or lifts is the Clarendon Hotel, Edinburgh. In this hotel the Otis Elevator Company, Limited (late American Elevator Company), are just fitting an electric passenger and an electric service elevator. The list of hotels on the Continent already fitted with "Otis" electric elevators is a long one, and includes many of the well-known hotels in Paris and other cities. Now that the public has learned that the "Otis" electric elevator is not an experiment, but thoroughly reliable and efficient in every respect, and also remarkably economical in cost of working and repairs, it is being adopted rapidly, one of the company's latest orders being for twelve electric elevators in one building in Berlin.

THE new Board schools, Watford, are being warmed and ventilated throughout by means of Shorland's patent Manchester grates, the same being supplied by Messrs E. H. Shorland & Brother, of Manchester.

MR. G. STRAUS, of 130 Queen Victoria Street, writes as follows:—Having recently given up one of my agencies for incandescent lamps, I beg to inform you that this in no way interferes with my trade in this article. I still continue to sell the same lamp which I have been supplying for so long, and which has given universal satisfaction. I am happy to say my works have also decided to keep in future here a much larger and better assorted stock than hitherto, and which will enable me to execute all orders with the utmost promptitude. Every lamp is carefully tested before leaving the works, and as an additional precaution I have made arrangements, at considerable expense, to have every lamp retested before leaving my warehouse.

OFFICES—
22
QUEEN'S RD.,
Bayswater,
London


TURPIN'S

Parquet Floor,
Joinery and
Wood Carving
Co., Ltd.


PARQUET FLOORINGS

One inch and ½-inch thick.
Immense Stock always ready for Laying.

ARTISTIC



Turpin's Patent 5-16 inch thick.
Laid in Patent Composition on Concrete,
Stone, and Deal Floors. (See section.)




1-inch Parquet.
Wood Backing.

ESTABLISHED 28 YEARS.

OAK BLOCK FLOORINGS

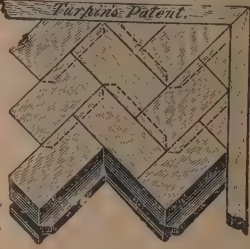
One inch thick, from 4/10½ per yard super.
Also in Pitch Pine, Teak, Deal, &c.

JOINERY.



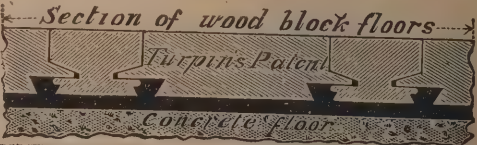
MARBLE MOSAIC
PAVEMENTS

Executed in all
Styles.



Turpin's Patent
INTER-
LOCKING
SYSTEM
for Laying
Block Floors on
Concrete, Stone,
and Deal Floors.

Section of wood block floors



Turpin's Patent
Concrete floor

COUNTRY HOUSE
INSTALLATIONS A
SPECIALITY.

ELECTRIC

ELECTRIC
PUMPING
WINDING &
TRACTION WORK.

SAM'L CUTLER & SONS

16 GEORGE ST
WESTMINSTER
LONDON.

PROVIDENCE WORKS
MILLWALL

COMPLETE
EXPORT
PLANTS

LIGHTING

PUBLIC
BUILDINGS
THEATRES, ETC.

JOSEPH WILLIAMSON & CO.

Sashes, Sewer Ironwork, Railway Plant, Ornamental Columns and Brackets for Railway Stations, Cast-iron Tanks, and every description of Castings for the use of Engineers, Builders and Contractors. Estimates gladly furnished on application.

NATIONAL TELEPHONE No. 6.

MIDLAND FOUNDRY, WELLINGBOROUGH,

MANUFACTURERS OF

Cast-iron Columns, Stanchions, Girders, Window

Estimates gladly furnished on

Telegram, "IRON, WELLINGBORO."

ELECTRICAL.

MESSRS. CROMPTON & CO., of 148 Brompton Road, have recently carried out the electrical heating of the Vaudeville Theatre. At first it was contemplated to use a system of hot-water heating, but, after carefully considering the matter, the management decided that electrical heaters afforded a more advantageous system. Twenty-two "box" or wall radiators and four large portable radiators, all of the Crompton-Dowsing type, are employed, and they answer the purpose admirably. The temperature of the theatre is maintained at 60 deg., while the corridors may be as low as 40 deg. The heating arrangements are under absolute control, and any portion may be turned off or on at will. The electricity used is taken from the Charing Cross and Strand Electricity Supply circuits and charged at 4d. per unit, and when all the apparatus is at work 9 units are consumed per hour. With electric radiators there is no danger of fire, as there is no combustion, and the temperature is about the same as that of hot-water pipes. The electrical cables are of Henley's highest quality, switches, cut-outs, safety connectors, &c., of the best, and Messrs. Crompton endeavour to make this pioneer installation complete in every respect. Some difficulty was at first experienced with regard to the fire office and London County Council, as no rules were in existence which covered the case; but all the authorities appear now to be convinced that electric heating, when properly installed, is very safe, and perfectly suitable for public buildings. It is stated that electric radiators are often used in an auxiliary sense where sufficient heat is not obtainable in buildings heated by hot water. They are also useful for chilly evenings, and at times when it is not cold enough to work the whole system of heating, but a little warmth is required in any particular room or portion of a room.

OUR HEALTH IN WINTER.—Dr. Andrew Wilson, writing in *Lloyd's Newspaper* on diet, says: "The teaching of nature should never be neglected, and in the matter of winter food let us see we are not wrong, and take sufficient fat, for the changes that result in the wear and tear of our bodies are lessened in intensity by the fat of food, and the need for flesh is always less when fat forms a due proportion of our diet." The Doctor proceeds to enumerate natural products that are admirable, among them "Cocoa" with its contained Cocoa Butter. Relatively to this it may be said that EPPS'S PREPARED COCOA retains all the constituents of the natural Cocoa, including the oil or butter, intact.—ADVT.

VARIETIES.

WE have received a copy of their new "Empire Series" from Messrs. Marion & Co., which by special permission has been dedicated to Her Majesty Queen Victoria. It contains sixteen views (10 inches by 8 inches) of Windsor Castle from photographs taken expressly for the purpose by Mr. Horatio Nelson King. One most commendable feature of the publication is that each one of the series will form an album complete in itself, and not a hotch-potch of pretty things from here, there and everywhere. The series will comprise two sections, devoted respectively to eminent personages and historical buildings and places of the Empire. Valuable letterpress accompanies the illustrations by a competent writer. The illustrations show the Castle itself, also the east terrace and the east and south fronts. Theed's statues of the Queen and Prince Albert, the Throne Room, Vandyck Room, Grand Reception Room, Waterloo Chamber, Tapestry Room, Oak Room, Grand Corridor, Green Drawing Room, St. George's Hall, Albert Memorial Chapel and choir of St. George's Chapel.

THE *Irish Times* says:—The Grand Jury of the county of Cork have appointed a committee to inquire into the condition of the sea wall at Youghal and the danger to county roads likely to be affected by the breaking in of the sea, and the value of the property likely to be inundated, and to draw up a report for the information of the Grand Jury at the Summer Assizes. Since the report of the engineer of the Great Southern and Western Railway Company had been laid before the Grand Jury the sea had encroached considerably, and that unless some action was taken by landowners and the public before next winter, the whole district would be inundated by the sea.

At the meeting of the Edinburgh Association of Science and Arts Mr. Wm. Hume gave an address on "Photographic Colour Printing."

At the meeting of the Birmingham City Council on Tuesday the technical school committee were authorised to spend a sum of 6,080l. for providing an electric lighting installation at the new technical school.

THE Morecambe District Council have applied for a loan of 5,436l. for private street improvements, and an inquiry has been held.

THE Royal Scottish Academy, Sir George Reid, P.R.S.A., presiding, have agreed that for this year no new election of Associates should be made.

THE NEW REFUSE CART.

SALBERG'S AUTOMATIC SANITARY APPARATUS CAN BE ADAPTED TO
ANY EXISTING DUST CARTS.

REFUSE ENTIRELY HIDDEN. BAD SMELLS PREVENTED. NO CLOUDS OF DUST.
ALL REFUSE IS IMMEDIATELY AUTOMATICALLY DISINFECTED.

"Its simplicity and efficacy excite wonder."—*Morning Advertiser*.

"Commends itself at once as a simple and indeed perfect remedy for the everyday danger of open Dust Carts."—*Daily News*.



SALBERG'S SANITARY BINS.

All Refuse placed in these Bins is
AUTOMATICALLY DISINFECTED.

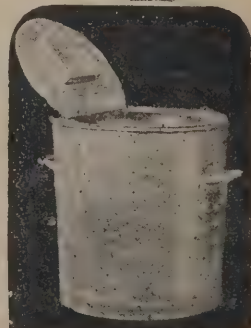
DISINFECTANT REQUIRES RENEWING ONLY ONCE IN SIX MONTHS.

SOLE PROPRIETORS AND PATENTEES—

F. W. DECKER & CO.,

23 GARLICK HILL, CANNON STREET, LONDON, E.C.

(NEAR MANSION HOUSE STATION)



THE CHARING CROSS BANK.

THIS bank has been established nearly a quarter of a century, and with every year has increased its business. It is conducted on the same lines as the large joint-stock banks, but it will take deposits as low as 10%. Money can be borrowed at a reasonable rate of interest in sums ranging from 30% to 2,000%, and any suitable security is accepted, advances even being

PASSENGER LIFTS.

At the ordinary meeting of the Civil and Mechanical Engineers' Society a paper on the subject of "Passenger Lifts" was read by Mr. S. A. Court, vice-president. Having referred to the earlier forms of passenger lifts in use in England, the author gave details of various improvements lately introduced, such as the variable power hydraulic and the electrical systems, and



CHARING CROSS BANK: INTERIOR.

made on furniture. The interests of the bank and of their clients are safeguarded, and the latter are not subject to extortion. The prospectus can be obtained of the manager, Mr. A. Williams, Charing Cross Bank, 28 Bedford Street, Strand, W.C.

"HALF AN HOUR" in a gold mine is one of the new features represented at the Royal Aquarium, Westminster—a representation of the Saratoga Mine in the Rocky Mountains, Colorado.

gave figures to support his view that the latter has already shown by practical working that at even present prices the electric lift is a serious competitor with the hydraulic lift.

Safety appliances and possible causes of accidents were then detailed, and mention was made of the recent fatal accident in the City. The author estimated that on an average fully 90 millions of passengers are carried annually in London alone, and pointed out that the percentage of accidents is extremely small.



ART PLATES FROM "THE ARCHITECT."

Awarded Gold Medals, International Health Exhibition and Architectural and Building Trades Exhibition (1889).



PROOFS on PLATE PAPER of the following Illustrations which have appeared in "THE ARCHITECT" can now be obtained in a separate form suitable for Framing.

THE MARTYRDOM OF ST. STEPHEN. By E. J. POYNTER, R.A. Size, Forty Inches by Fifteen Inches. Price One Shilling. Free by post, carefully packed inside patent roller, One Shilling and Three Pence.

"AND THE SEA GAVE UP THE DEAD." By Sir FREDERIC LEIGHTON, President of the Royal Academy. A few Proofs of this Fine Art Plate can be obtained (if ordered at once), price Two Shillings each. Free by post, carefully packed inside patent roller, Two Shillings and Two Pence.

THE BANQUET. The well-known and beautiful Chromo-Lithograph by H. STACY MARKS, R.A. Size, Thirty-nine Inches by Fifteen Inches. Price One Shilling. Free by post, carefully packed inside patent roller, One Shilling and Three Pence.

1. AN OFFERING TO CERES. 2. THE EDUCATION OF BACCHUS. 3. MINERVA VISITING THE MUSES. 4. JUDGMENT OF MIDAS. By W. HAMILTON. Size of each plate, Forty Inches by Fifteen Inches. The whole forming a very beautiful Frieze in Bartolozzi Mezzotint. Price per set, Six Shillings on Proof Plate. Free by post, carefully packed inside patent roller, Six Shillings and Six Pence.

THE HISTORY OF JOAN OF ARC. By M. JULES EUGENE LENEPVEU. From the Wall Painting in the Panthéon, Paris. Four Pictures on one Plate. 1. Domremi: Inspiration. 2. Orleans: Struggle. 3. Reims: Triumph. 4. Rouen: Martyrdom. Size, Forty Inches by Fifteen Inches, on Proof Plate. Price, Two Shillings. Free by post, carefully packed inside patent roller, Two Shillings and Six Pence.

THE WATERLOO HEROES. By J. P. KNIGHT, R.A. Dedicated, by Special Permission, to VISCOUNT WOLSELEY, K.P., G.C.B. Proofs, price One Shilling each (thin Plate Paper). Proofs (Special), price Two Shillings and Six Pence each (thick Plate Paper). Size Twenty Inches by Thirty-six Inches. Framed and Glazed in Oak, Complete, One Inch, Twelve Shillings each. Ditto, One and a Quarter Inch, Fourteen Shillings each. Ditto, One and a Half Inch, Seventeen Shillings each.

THE TOILERS OF THE DEEP. Two Tinted Ink Photographs. Size, Eighteen and a Half Inches by Thirteen and a Half Inches. Price Two Shillings. Free by post, carefully packed inside patent roller, Two Shillings and Three Pence.

JOHN SELL COTMAN'S PICTURES, lately on Exhibition at the Burlington Fine Arts Club. The Plates are uniform in size, Twenty-one Inches by Fifteen Inches. The Titles are as follows:—1. Rouen from Mount St. Catherine. 2. Breaking the Clod. 3. View in North Wales. 4. Norman Arches. 5. Byland Abbey. 6. Norwich, from the Cromer Road. 7. Dewy Eve. 8. Mousehold Heath. 9. Cader Idris. 10. Castle Eden Dean, Durham. 11. Bamborough Castle. 12. The Interior of Norwich Cathedral. 13. Mountain Pass in the Tyrol. 14. Postwick Grove.

The price of the Set is Twelve Shillings and Six Pence; by post, carefully packed in patent roller, Thirteen Shillings. Kindly order early, as only a limited number of proof copies can be obtained.

May be obtained from all Newsagents, Booksellers, Messrs. W. H. SMITH & SON'S Bookstalls, or from the Publisher, P. A. GILBERT WOOD, 175 Strand, London, W.C.

ILLUSTRATIONS.

TERPSICHOIRE.

NATIONAL PROVINCIAL BANK OF ENGLAND, PICCADILLY.

WILLIAMS, DEACON AND MANCHESTER AND SALFORD BANK,
PALL MALL.

DINING ROOM, JUNIOR CONSTITUTIONAL CLUB, PICCADILLY.

THE BUILDING EXHIBITION.

THE Building Exhibition, to be held at the Royal Agricultural Hall, Islington, regarding the arrangements of which we have from time to time alluded, will open on Monday, the 26th inst., and we are able to supply the following particulars referring to the proposed exhibits of sundry prominent firms.

Ellis, Partridge & Co.

The Stand of Messrs. Ellis, Partridge & Co., of Grey Friars, Leicester, must be personally inspected to appreciate the goods, as we can only call attention to the various wares by their simple names. The exhibit will consist of "Redbank" red-pressed facings, also moulded and ornamental bricks in great variety for arches, cornices, strings, door and window-jambes, floor-bricks, panel-borders, air-bricks, terra-cotta in various forms, a large entablature bearing date 1895. These bricks are now used in all parts of the country, and the firm are now supplying them for county council buildings, technical schools, electric-lighting stations, public libraries, Board schools, &c. The Stand of Messrs. Ellis, Partridge & Co. will be a new feature, being specially made to display their exhibit, in varnished wood and navy blue cloth. Messrs. Ellis, Partridge & Co. have, we find, much increased their output during the past year, and their works are lighted by electricity.

Stanley Brothers,

of Nuneaton, show their excellent manufactures at Stand No. 163, Row A—glazed bricks and tiles, blue bricks, coping, &c., red, buff and blue quarries, red and brown roof tiles, red ridges and finials, red and buff chimney-pots, ornamental red terra-cotta; and at Stand No. 217, brick, tile, sink and gully-trap presses. Stanley Bros. are known for their excellent building, paving, stable bricks, &c., not to mention that they

supply all that is wanted in the way of ornamental tilework for all purposes, garden requirements and such like included.

S. & E. Collier.

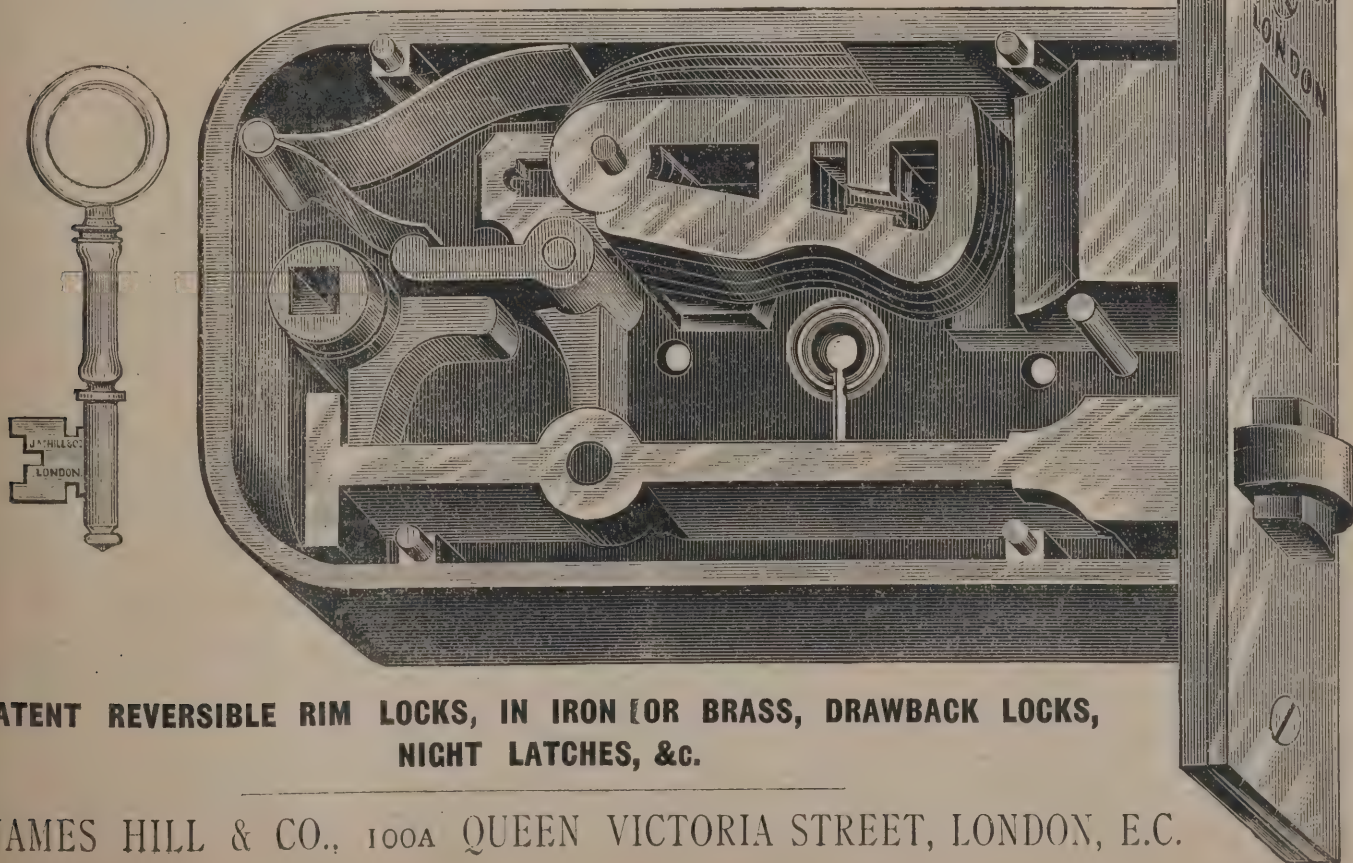
Messrs. S. & E. Collier, of the Brick, Tile and Pottery Works, Reading, provide a very interesting exhibit for architects, builders, &c., in the samples they show of their excellent specialties. A principal feature of the exhibit will be their red roofing tiles, machine and hand-made, with specialties for insuring their vegetating, and others that will keep their colour. Also red ridges of all kinds, intersecting tiles, finials, terminals, terra-cotta for building construction, mural tiles, air bricks, panels, &c., which, we should mention, Messrs. S. & E. Collier make a special feature of in their manufactures. In this case, also, we must advise our readers to personally inspect this exhibit, as we cannot do proper justice to it in a bare recital of what is shown. In addition, we would call attention to the splendid colour of red that characterises the above-mentioned wares.

H. J. & C. Major, Limited.

The prominent features of this exhibit will be Messrs. Major's patent weatherproof roofing tiles of two or three patterns, notably their improved patent double Roman pattern showing a hip, and also their patent interlocking Broseley plain tiles, having a hip and valley. Both kinds of tiles will be laid on small but suitable specimen roofs exactly as they are used on buildings either large or small, except that the pitch of the roof may be higher or lower, as designed. These tiles are simply laid on the battens by lugs or nibs, and do not require the aid of nails to fix them, nor bedding in mortar or cement to keep out rain or snow, while there is sufficient ventilation to prevent decay of roof timber. They therefore offer many advantages over ordinary tiling, inasmuch as there is less weight on the roof when completed, and security against rain, snow and wind stripping. At the same time a tile may be removed and replaced as firmly as at first. It may also be stated that the design of these tiles includes great strength, and a roof covered with the patent Romans or patent Broseley tiles is not liable to the excessive damage caused by breakage by pressure of ladders placed against them and workmen moving about on them. The economy effected by using the tiles in question includes somewhat less timber, saving of nails and material for bedding, more expeditious work, and therefore reduced working expenses. Briefly, a sound roof is secured at a minimum cost.

HILL'S WHEEL-BOLT MORTICE LOCKS

En suite with Master-Key Arrangement,
FOR HOTELS, HOSPITALS, ASYLUMS, &c.



PATENT REVERSIBLE RIM LOCKS, IN IRON [OR BRASS, DRAWBACK LOCKS,
NIGHT LATCHES, &c.

JAMES HILL & CO., 100A QUEEN VICTORIA STREET, LONDON, E.C.

John Grundy.

As usual Mr. John Grundy will be represented. His specialties are so well known, apart from his name invariably appearing at exhibitions, that no large display is required. His patent church-warming apparatus is well known to all our readers. He will show some patent fire-grates, one at work, that when in action will keep lighted for seventy hours without any attention given to it, the cost of the fuel being about 3d. to 4d. No better fire-grates than these can be expected to be on exhibition. After the experience of this winter many will be glad to examine them and make a memorandum for present or future needs.

Gibbs Brothers,

of Charnwood Works, Loughborough, are manufacturers of red and white facing bricks, made from the well-known Leicester-shire clays, hard, durable and of excellent colour and quality, which are to be on view; also their superior sand-faced bricks for villas and country houses, enriched mouldings, terra-cotta string-courses, bases, corbels, diapers, panels and every description of ornamental moulded bricks to any design. Their white bricks are specially suited for internal work for churches, and for colour and durability cannot be surpassed; also plain and ornamental red ridges, finials, keystones, arch bricks and ventilators, red and buff quarries and floor bricks, chimney tops, &c. Owing to the extremely severe weather of the present year Messrs Gibbs Bros. were unable to make any specialties in bricks or terra-cotta for the exhibition, and the whole of their exhibit has been selected from their ordinary stock. Their red facing bricks are now being used on the new hospital at Shooter's Hill, Woolwich, for the London County Council, and give every satisfaction. Having recently erected new works and put down some of the latest machinery, they are in a position to execute all orders with care and despatch.

L. V. Riley & Co.

Messrs. L. V. Riley & Co., engineers and electricians, 10 Throgmorton Avenue, E.C., are among the exhibitors. Their exhibit at the exhibition will consist of brass, copper and iron-work in new designs for electric fittings, and they have opened a new department in that particular branch. Messrs. Riley & Co. have a reputation not only as engineers and electricians, electric-lighting contractors, &c., but as art metal workers, contractors for country house and mansion installations, electric-lighting specialties, bell, telephone and motor work. In this

new departure for use of electricity as an illuminant there is a special call for artistic fittings at a moderate price. The exhibit will show that these conditions can be complied with.

Incandescent Gas Light Co., Limited.

The new Welsbach system of lighting, by the Incandescent Gas Light Co., Limited, of Westminster, has in the last few years made rapid strides in public favour, and has come into very universal use. We have more than once described the system and explained the technical details and the process of manufacturing the filaments or mantles, in the use of which the secret of success in this system of lighting depends. In using this system an atmospheric gas-flame is produced, also the noxious effects of gas, smokiness, &c., are eliminated. For a serviceable light it cannot be excelled. Electric light does not, we think, surpass it, and the general favour it has found is a good credential. The light is also particularly adapted for an able designer to produce artistic drawings for the production of ornamental glass shades in every variety for the gasaliers.

Kauri Timber Company.

This company has acquired twenty-eight timber mills in the northern part of the North Island of New Zealand. For over a quarter of a century it has been the idea to make known at this side of the world the value of the Kauri pine, which seems exclusively confined to New Zealand. The company state that it grows to a height of 150 feet—that no doubt is the average, though they can be seen 200 feet in height, straight, like a ship's spar, without branching out, till more than 100 feet high. The girth of the pines is enormous in many cases. It is impregnated with a gummy substance, and is practically indestructible by damp. Planed up and varnished it is most valuable for panelling or cabinet-work, and no one who looks at the samples to be shown by the Kauri Company can wish for a more beautiful wood. The company are introducing it for every purpose that wood is employed for. In addition it is to be supplied in wood blocks for paving carriage-ways. It may seem an ignominious use to which to put such beautiful wood, but there is no doubt that no wood carriage-paving could stand half the wear and tear of the Kauri wood, owing to its antiseptic qualities.

Charles Erith & Co.

Messrs. Charles Erith & Co., heating, ventilating and drying engineers, occupy Stand 120A, Row D., where all par-

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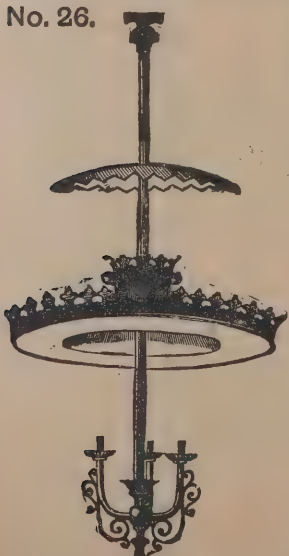
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J. C. HALLIDAY,
INVENTOR AND MANUFACTURER.

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particulars and information in regard to their excellent appliances may be got by visitors. All machines which are too large to exhibit will be shown by photographs, plans, &c., and their uses demonstrated. They can be seen in operation where they are in actual use, we understand, by any visitors who make application for that purpose. The machines include hot blast mechanical heating and ventilating apparatus, as used for factories, schools, churches, theatres and large buildings generally; indirect steam heating combined with positive ventilation on "Plenum" principles. Erith's timber-seasoning system; hot-air methods, under perfect regulation as regards volume of air, temperature, humidity, &c. Erith's economical brick-drying system; hot-air methods, with Cummer's patent hot-air furnace methods; these dry 20,000 plastic bricks with one ton of small coal; labour and handling generally saved by the use of trucks. The "Cummer" patent automatic drying and calcining machine, is largely used for drying and preparing clay for dry grinding; the only economical and successful method of drying clay artificially; all kinds of materials, from chemicals and minerals to wet grains and refuse can be most economically and successfully dried in modified styles of the "Cummer" drying machine. The "Simpson" brick press, the leading American machine, is of perfect construction, resulting in large output of the finest possible bricks, while using very little steam, also the "Simpson" apparatus for steaming and softening shales, &c. Circulars may be obtained at the Stand which will prove very useful for future reference by those who inspect this exhibit. The great advantage of this system of warming and ventilation of Messrs. Charles Erith & Co. is its efficiency, with freedom from complication of apparatus. Natural means have been relied on to devise a simple system to secure the purpose in the most effectual way at a small outlay. In wintry weather the question of warmth is necessarily uppermost, but in periods of summer heat the public only long to have a supply of cool air in their houses, which is supplied by this system.

Robert Adams.

At the stand of the Adams Building Trades' Emporium, 67 Newington Causeway, S.E., are shown Robert Adams's widely known and used door springs, ventilating apparatus casement bolts, "Victor" stays, sash fasteners, &c., as under:—The "Crown Victor" door spring for silently closing swing doors. These springs are most compactly designed, and admit of ready fixing in any position. The hydraulic check is certain in action, and the power of the spring can be regulated

to suit any requirement, whilst the working parts are so arranged as to offer a minimum of friction, so enhancing the durability of these goods. The "London Victor" is designed for silently closing single-action doors, and embodying all the features of the "Crown Victor," and strongly recommended for all classes of work, particularly where reliable springs are necessary. The "Empress Victor" is a pneumatic and overhead check spring, which is very neat in appearance, and the fittings are very strong, being made in malleable iron, and will admit of the door being opened wider than any other overhead spring. The "Combination" is a spring designed for closing the door silently into the frame, and allows it to be set open at any desired angle, so dispensing with the unsatisfactory leather straps and lance wood springs. The "Folding Stay" fanlight openers are recommended for neatness and efficiency and easy action. Another well-known pattern is the "Link Motion," which also works by means of screw rod and regulator. The ratchet fanlight adjustment is useful for small fanlights, working with cord or long arm; is cheap, neat and strong. Among other patterns may be mentioned the "Scott" and "Twin Screw," working with cord or rod arrangement, among the recent being a series of openers which are now being worked out, actuated by stiff back chain, and worked either by cord or rod. The screw rod and regulator action for securely controlling long ranges of light are also shown, and the same also adapted for opening and closing skylights in any position. Samples representing the well-known bolts called the triple action, weather-proof tongue, thrust action, espagnolette, &c, "Triumph" sash fasteners, and "Victor" casement stays are shown.

Arthur W. Adams

exhibits his new patents, the "Impervious" metal casements and frames as follows:—No. A1 section, guaranteed weather-proof, suitable alike for opening inwards or outwards, singly or in pairs, hinged at sides, top or bottom or on pivots, and fits jambs of any material or detail. The section being moulded is neat, at the same time is simple, strong, and very rigid. There are four weather stops and three spaces, and a channel with ducts to collect and pass away any interior surface moisture. Accuracy of work, &c., is ensured by improved methods in making. The repeated orders executed for this section already proves how much this invention is appreciated. The "Impregnable" automatic bolts for metal casements supersede the common slide pattern, being neater, more efficient, and self-

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locking. The "Impregnable" front door bolts, with automatic lever-locking action, give the greatest security, combining in one case the functions of a night latch, hall door lock and tower, or barrel bolts. The lever combination is unpickable and forcible, and absolutely reliable. The "Impregnable" locking bolts are also made to suit all casements and other doors, gates, &c. The "Exodus" panic door fittings, of guaranteed reliability for safety and security, approved and passed by the London County Council, and greatly admired for their perfect and easy action and attractive appearance, may also be used to serve for entrance, but cannot be picked or forced from the outside, nor can the interior safety use be interfered with.

John Lewis.

Mr. Joseph Lewis, of 5 and 6 Great Winchester Street, E.C., shows at his stand lightning conductors and their several fittings and fixings, and important improvements therein, notably his patent "Lewis Link" coupling, which is the only device made in a single piece for connecting the upper terminal of lightning conductors to the copper tape. The advantages of this simple arrangement are many and obvious upon examination of this coupling as exhibited in sections at this stand. This coupling was awarded a prize medal at the great Electrical Exhibition, Crystal Palace, 1892. In addition are shown specimens of solid high conductivity copper tape, copper rope, &c. It affords a larger area of surfaces in permanent contact than is possible in any other device for a similar purpose. An improved electric bell which cannot fail to ring in hot, cold, damp or dry atmospheres; any number of bells may be rung in any part of a building by single wiring from one push. A model to scale of a lofty chimney, showing the method adopted for altering, repairing, pointing or banding shafts and steeples without the expense of scaffolding, and without stopping the working of the shaft.

John Tann.

Mr. John Tann, lock and safe engineer, shows his new pattern party-wall doors. The special feature of these doors is an angle iron stile on door instead of the ordinary flat stile, the advantage being that it adds greatly to the rigidity of the door and prevents it warping, a great consideration in event of fire; the prices are also much lower than that charged for the usual



panelled doors. The new pattern fire-resisting warehouse doors are designed for heavy risks of fire, the back of the door is fitted with a 4-inch chamber filled with steam generating fire-resisting composition. An ingenious bolting arrangement is fitted which ensures the door being fastened, as only one movement is required to throw a bolt at top, bottom and front. In face of the failure of so many doors in recent great fires this is just the thing that is wanted, and should command a ready sale, the prices being moderate. Next come ordinary panelled party-wall doors and a first rate well-finished plate closet door for butler's pantries. Following these are strong room doors of various prices and qualities, and lastly, a very fine specimen of a fire and burglar-proof banker's bullion room door weighing 2 tons, complete with steel vestibule and ventilating grille. There is also a good show of safes from a neat five-guinea safe for dwelling-house purposes to the elaborate burglar and drill-proof diamond merchant's safe. Locks of all descriptions are also shown. This business was established in 1795, and the firm just enters into its second century, and is the oldest safe manufacturing firm in the world. The position is unique that in over one hundred years the business has been in the hands of only two generations, the business having been founded by the father of the present Mr. Tann, who entered the factory in the early thirties, when cast-iron chests were mostly in use, and a few wrought-iron safes with an inner lining, forming only an air chamber. Since then what alterations have been made in the manufacture of safes at the works where, one hundred years ago, the firm were making cast-iron chests about $\frac{1}{4}$ inch thick, weighing only a few hundredweight? And now they are making safes 3 inches thick of combined steel and iron, and a single safe weighing 7 and 8 tons each, with chambers 4 to 6 inches thick, filled with the latest invented steam-generating, fire-resisting composition.

The Vitreous Enamelled Glass and Tile Company.

This company (office and works, 19 Goulton Road, Lower Clapton, N.E., Stand No 21, Row A) exhibit a number of panels of glass decorated in various styles—floral, ornamental, heraldic, ecclesiastical, &c.—in their vitreous enamel, and by the judicious use of gold, which is fused into the glass at the same time as the enamel, gain a remarkably brilliant effect. The advantage of this style of decoration with its freedom of treatment gives not only a brilliant colouration, but by artificial light shows as well as by daylight, and in some cases even better. A maximum of light is obtained by the decoration being on white glass, though the effect on coloured glass is



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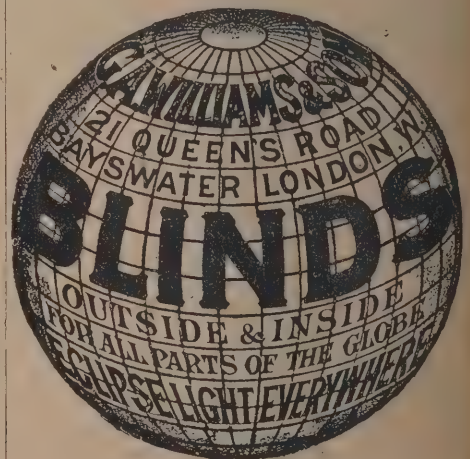
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very good. For fascia work we fancy it will have a peculiarly good effect, as seen in the name over their stall; we also notice the City Arms as a specimen of heraldry. It seems to work up well for the Japanese and Chinese styles, and some of the scroll patterns with gold for door panels, fanlights, &c., point to it as a coming style. The lettering also is very good, and if, as we understand, the prices are not at all out of the way, we see no reason why an innovation in glass decoration having permanency should not make good headway.

Hermann & Co.

We were recently greatly interested in inspecting some very ingenious wood-carving machines patented by Messrs. H. Hermann & Co., of Dod Street, Limehouse, and some panels turned out by them for exhibition at the forthcoming Builders' Show at Islington. The carving, which is mainly, almost entirely, in fact, executed by the machines, is, however, carefully hand-finished, and possesses all the crispness and delicacy of the best handwork, than which it is of course immensely less expensive. It is eminently adapted to all purposes to which the latter could be applied, as well as to many where its cost would be prohibitive, as house and room doors, dados, mantelpieces, shutter-boxes, ship and railway saloons, offices, refreshment buffets, &c., as well as to cabinetwork and especially piano fronts and backs. The machines execute with equal facility the boldest and the most delicate designs; nor is intricacy any obstacle, and while Messrs. Hermann & Co. have a selection of some hundreds of patterns in stock, they are prepared to work with accuracy to their customers' drawings. Although Messrs. Hermann & Co. have only recently added this branch to their already extensive business, the firm has been established since 1877 as timber merchants (and importers) and furniture manufacturers, their chief manufacture being bedroom furniture. It is one of the largest firms of its kind in Europe. They employ nearly 500 hands, and the factory covers an area of over 56,000 square feet. They have every facility of waterway for conveyance of timber from the docks. Their plant and machinery are of the newest construction, and embrace all the latest improvements, including an electrical plant, amongst which is an electric crane which is used for lifting timber from the barges on the adjacent canal. They also have a branch at Evansville (Indiana, U.S.A.), the factory, saw mills, drying house, and timber yards of which cover an area of about 12 acres. The drying house has a capacity of 1,000,000 feet.

THE WEATHERING OF BUILDING STONE.*

THE slow decay of everything exposed to the weather has become a proverb, and from the earliest times men have moralised on the "gnawing tooth of time," as though time were some relentless monster devouring slowly man and all his products; but of late years geologists have begun to make some inquiries as to the monster, and to find out somewhat exactly what time's gnawing tooth really is. The question is one of great importance to the student of geology, for the weathering and wearing away of the solid rock and the building up of its materials in new places are among the most significant factors in the ceaseless round of change by which mountains and valleys and plains are carved and remodelled on the earth's surface. To the geologist no structure is permanent, the "everlasting hills" do not last for ever; in fact, the destructive forces are most actively at work where the mountain lifts its head so boldly, as if to defy the elements.

The "tooth of time," when examined a little carefully, turns out, as so many bugbears do, to consist of very simple and innocent elements. Air, water, change of temperature—these three factors alone, or in combination, with traces of a few common acids, are the effective forces in the weathering of the rocks of the geologist and of the stone of the architect. The effects produced by these agencies may be purely mechanical or purely chemical, or more often a mixture of both.

In climates like our own, where the extremes of heat and cold may run from 100 deg. in summer to 15 deg. or 20 deg. below zero in winter, the effect of mere change of temperature may be important in its disintegrating action on building stone. The rise of temperature when sunshine falls upon the wall of a building is imparted to the outer layers of particles of the blocks of building stone and expands them, granite having been found to expand '000004825 inch per foot for each degree Fahrenheit, marble '000005668, sandstone '000009532.

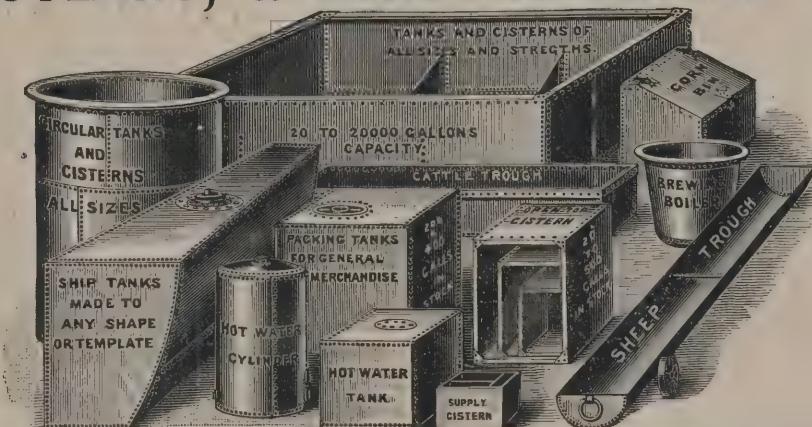
Since stone is a poor conductor of heat, the surface will expand more rapidly than the interior, and there will be a tendency to form minute cracks and to chip off the surface of the stone. It is said that the south side of stone buildings, exposed to great changes by the coming and going of sunshine, begins to roughen and disintegrate sooner than the north side

* A paper read by Professor Coleman, School of Practical Science, Toronto, at the fifth annual convention of the Ontario Association of Architects, and published in the *Canadian Architect*.

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in New York and other American cities. The ill effects of change of temperature will, of course, be more apparent in the case of stone like granite, made up of minerals differing in their rate of expansion by heat. This is most strikingly shown in case of fire, when granite, though stronger and more compact than sandstone or limestone under ordinary circumstances, crumbles far more easily in the intense heat.

Another injurious effect of change of temperature is to be found in the loosening of the joints between the blocks of stone in a building. Supposing the stone to have been laid in summer, all the blocks will occupy less space in the cold of winter, and minute fissures will tend to form in the cement or between it and the stone. These fissures admit water and make the starting-point for other changes.

Change of temperature alone is, however, not a rapid agent in disintegration. It is the presence of water that gives it efficiency as a destroyer in climates like ours in winter, where freezing and thawing occur in rapid succession. When water freezes it expands with an almost irresistible force, which has been estimated at 138 tons per square foot at 2 deg. below freezing, and is quite sufficient to rend the strongest rock. All the tiny fissures and crevices of a block of building stone exposed to rain or melting snow become filled with water, which may afterwards freeze, wedging off fragments. Another thaw, followed by another frost, pushes the parts still farther asunder, until the stone splits and crumbles. Stone buildings of many kinds illustrate this action on the sides exposed to storms. It is very well seen on many New York brown stone houses, where the porous Connecticut sandstone has been sawn and set on its edge, and after a few years scales so as to be quite unsightly.

The action of frost depends very largely on the porosity of any stone exposed to its influence. A compact massive stone like granite or many limestones is little affected, while porous limestones and especially sandstones are very quickly injured in exposed positions. In this respect the capacity of a stone to absorb water is of great importance, and one may say with Sterry Hunt that, other things being equal, "the value of a stone for building purposes is inversely as its porosity or absorbing power." N. H. Winchell gives in a report of the "Geological and Natural History of Michigan" (vol i. p. 197, &c.) a table showing that massive crystalline stones, like granites, syenites and gabbros, absorb very little water, generally much less than 1 per cent.; dolomites absorb a little more, and dolomitic limestones still more, up to 3 or 4 per

cent. Limestones absorb rather less, while sandstones absorb very much more, the lowest amount in his table being 3 per cent., and the highest 12·69 per cent. Sterry Hunt found that Potsdam sandstones from Canada absorbed from 0·50 to 3·26 per cent., Medina sandstones from Canada 3·31 to 4·04 per cent., and subcarboniferous sandstone from Ohio 9·59 to 10·22 per cent. Silurian limestones and dolomites from Canada examined by him absorbed from 0·11 to 5·55, while tertiary limestones from Caen, France, absorbed from 15 to 16·05 per cent. of moisture.

As a general rule a stone absorbing 10 per cent. of water crumbles rapidly in our winters, and should not be employed where carving or a fine finish of any kind is exposed to the weather.

Thus far the purely mechanical side of weathering has been discussed. Let us now turn to the chemical side. The air consists of about 4 parts of nitrogen and 1 of oxygen, with varying amounts of watery vapour, a little carbonic acid and traces of ammonia and other nitrogen compounds. In cities it may also carry soot and traces of some common chemical compounds, such as sulphur dioxide, sulphurous and sulphuric acids, hydrochloric acid, nitrous and nitric acids.

Rain water is more or less strongly charged with oxygen, carbonic acid and other substances found in the air. The nitrogen of the air is inert and the oxygen and other substances are active only in the presence of water, so that very dry air has little or no effect in weathering. In very dry climates like that of Egypt monuments of stone may be ground off by driving desert sand acting as a sand blast, but are scarcely affected in other respects after 4,000 or 6,000 years' exposure to the weather. How differently a damp climate affects the same stone may be seen only too well in the Egyptian obelisks transported to London, Paris and New York. It is well known that in the last city the granite scaled so rapidly that the obelisk had to be coated with paraffin to preserve it at all.

(To be concluded.)

At the meeting of the Northern Architectural Association last week, Mr. J. Oswald, president, in the chair, Mr. J. M. Moncrieff read a paper entitled "Theoretical and Practical Notes on Beams, Columns and Roof Trusses."

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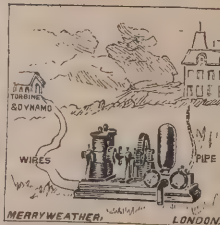
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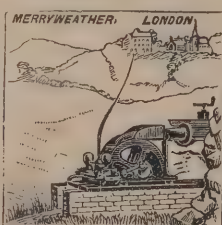
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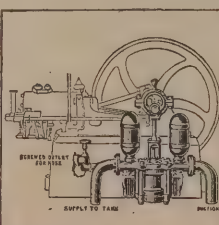
The "Times" says:—"A Practical Pamphlet."



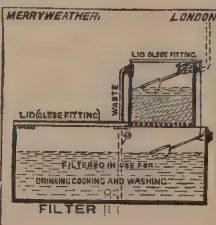
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PARLIAMENTARY PROCEDURE AS AFFECTING
LIGHT RAILWAYS AND TRAMWAYS.*

ENGINEERING enterprise in Great Britain is at present checked by the methods and cost of Parliamentary procedure, departmental restrictions and local opposition. It is desirable that every means of removing any existing unnecessary restriction upon engineering enterprise should be carefully considered; and it is incumbent upon the engineer to show in what way Parliamentary procedure and departmental restrictions, enforced by Parliament, may be modified to public advantage.

It is a matter of common knowledge and remark that while on the one hand the cost of transport and communication in Great Britain are in all cases high, in many cases almost prohibitory to some of the industries, and in nearly all cases greater than the cost of transport on the Continent, capital is not attracted by projects, however good, for the provision of cheaper means of transit even for districts where no facilities now exist. Capital seeks employment on moderate terms of remuneration, and cannot find it. Engineers see the necessity for improved and cheaper means of communication and transport, and are able to show how to provide it at an expenditure which may be profitably incurred. But however good the project capital is not attracted. Why? Chiefly because of the prohibitory burden which is placed upon almost every enterprise by the cost of Parliamentary procedure and by the restrictions which have to be enforced by the Board of Trade in conformity with its limited powers.

There are few countries in the world wherein it is more necessary to provide for cheap intercommunication between the great main roads, and cheap transit upon them, than in Great Britain, and there are none in which the constructive work could be more cheaply carried out. There is no country in which the necessary capital is more available than it is in Great Britain, yet there is no country in the world in which so little is being done, or in which so little progress is made towards cheap industrial intercommunication by means of light railways and tramroads. The reason is that under existing laws and Parliamentary procedure, and in consequence of the abuses connected with the latter, the cost of obtaining permission to provide the much required facilities makes it impossible to provide them profitably.

* A paper by W. Worby Beaumont and Stephen Sellon, read at the meeting of the Society of Engineers on March 4, 1895.

The authors propose to confine their consideration of Parliamentary procedure more particularly to those questions which affect tramways, tramroads and light railways, although in [almost all branches of engineering the same procedure is necessary and the same criticism applies.

Notwithstanding the Railways Construction Facilities Act of 1864, which might be termed the Railways (Opposition) Facilities Act, and the Tramways Act, 1870, cheap legislation as affecting those branches of engineering is almost as impossible as ever, and as regards the Railways Construction Facilities Act, 1864, not one light railway has been constructed under it. Municipalisation is one of the results of this costly procedure, as it affords some limitation to certain forms of vexatious opposition and interference, but the spread of municipalisation is very far from being an unmixed good and against it some very serious objections are urged.

All interested in the branches of engineering to which the authors have referred are familiar with the various steps in the procedure under the 1870 Tramway and other Acts, and in this paper it is therefore assumed that it is unnecessary to dwell upon this part of the subject. Some of the elementary points in the proceedings have, however, in their order, to be touched upon with a view to suggestions.

Advertisements.—As one of the first steps in promotion, it is necessary to occupy large spaces in local and other papers, setting forth in the form of an advertisement an abstract of the whole of that which is completely set forth in any tramway or other Bill. Even for smaller projects this may occupy three columns of a newspaper. Now, the whole of that which is really required in the interests of the public could be equally well set forth in a short announcement as to the name, nature and extent of the project and the names of those from whom a copy of the Bill might be obtained at the cost of 1s. The unnecessary expenditure with which, under present procedure, every tramway project is burdened, is in the case of tramways further increased by the regulation which requires that after the Board of Trade has approved the draft Order, the same shall be printed in full as an advertisement in the local newspapers. A regulation of the Board further adds to the expense by encouraging the ingenuity of some newspaper publishers in finding reasons which prevent their publishing at the required date the Bill or Order after Board of Trade approval—reasons which are said to be absolutely unsurmountable, although always evaded by the payment of extra special rates. This is the result of the rule requiring that

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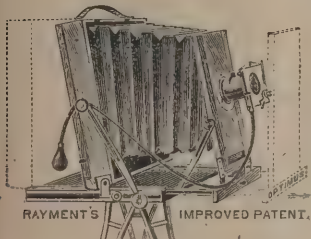
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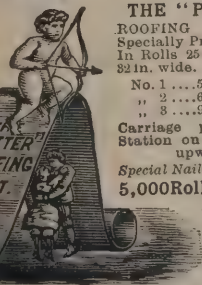


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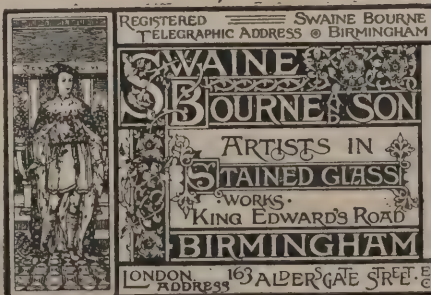
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the second announcement shall appear in subsequent issues of the same papers as the first. These announcements have really little, if any, value; no one reads them for amusement, and those who for business reasons have to read such dry matter resort to a copy of the Bill or Order. The cost of this very extensive advertising has often imposed very heavy strains on the resources of a small tramway company, and it must be noted that these expenses have to be met in the preliminary stages of the project, when the money available is necessarily a speculative advance, which subsequently has to be paid for by the public at an enormous premium if the Bill goes through. Men will not provide the funds for bringing forward a project which after all may be rejected, except under the promise of such large gains that the possible profit to them justifies the risk of total loss of the sum advanced. These large sums afterwards, when the Bill goes through and the public subscribes the capital, form a first charge, and not infrequently impose a burden which swallows up all, and more than all, the profits from running the concern. By reducing these preliminary expenses to a nominal sum, all this, as will be seen, might be avoided.

Plans and Sections.—Here, again, great and unnecessary expenditure is involved in the adherence to old rules and regulations, which ought long ago to have been deemed obsolete, as the reasons on which they are founded admittedly are. In past times, when no ordnance maps were available, the usually inferior, although specially made, lithographic plans were necessary, but to-day they would be economically and advantageously replaced by ordnance maps with the line of the proposed tramway drawn upon them. Sections are not necessary, although according to rules they are required, for it is useless to give a section when nine words in the Bill inform the public that "the tramway level is that of the roadways traversed," and even in the case of railways where new levels are followed it should be sufficient to make it incumbent upon the promoters to supply at a nominal charge tracings of so much of the section as actually concerns any applicant.

Deposit.—In connection with light railways and tramroads or tramways, the deposit now required and the payment of one-half per cent. of the intended capital on the passing of the Act should either be materially reduced or abolished altogether. If these lines are to be made for the benefit of industries and populations now suffering from the want of sufficient means of transit, it is desirable that relief in this respect should be complete. Most of the lines would be constructed along or beside

roads, little land required, and (unlike a main line of railway which would render much property idle if not proceeded with after the Act) no losses would be incurred by any owners. There would, however, be no objection to a deposit after obtaining the Act and before commencing construction.

Committees.—The present system of legislation, which requires the promoters of private Bills to appear before separate committees of each House to prove the preamble of their Bill, is most prejudicial, and can be of no use except to the pockets of those whose duty it is to steer these Bills through the House. It entails a lamentable waste of time and of money that should be available for construction, and necessitates the duplication of the same identical evidence before each committee. An easy way of avoiding this difficulty, if the procedure is necessary at all, would be to appoint joint committees to hear the evidence of the opposition to all Bills. This would not involve any necessity for a joint decision, as those representing each House might be free to give their own independent decision.

Private Agreements.—In many cases it is necessary in private Bill legislation, especially where municipal interests may be involved, to require the promoter of any particular scheme to obtain consent from the local authority or local authorities within whose jurisdiction the proposed works would be before he can be heard on the merits of the Bill. The objection to this is that it unnecessarily and sometimes enormously increases the cost of passing Standing Orders. The law as it stands gives a fictitious importance to this consent, or an importance at an improper and harmful stage in the history of any Bill. In view of public advantage it is, moreover, a disastrous requirement, as it sometimes stops a useful scheme almost at the outset. Local authorities and other opposing interests are enabled to impose conditions almost prohibitory, but these conditions, as well as blackmail, are made the subject of agreements which the committees never see. Moreover, these conditions may be to the pecuniary advantage of but one or two of the members of a local authority, but if the promoter refuses to accept them, the influence of the one or two members may be quite strong enough to obtain the adverse vote of that local authority. That these things are done is only more discreditable to the local authorities than it is to the legislation that makes it possible. By assenting to these conditions or by payment of blackmail promoters have obtained Acts by proving to the committee that the Acts would be to the public advantage. But these Acts would probably not have been obtained if the

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committee had known of the existence of these agreements, for they have in some cases doomed the projects to commercial failure from the first. If a project is likely to be to the public advantage, there should be no influencing conditions which may not be made public. The authors, therefore, hold that all agreements having any relation to promotion, construction or working should be supplied to the committee, and the committee should decide whether or not such agreements should be in the Bill, or modified, or struck out, whichever they deem best.

Estimates.—During the progress of both opposed and unopposed Bills, it is desirable that Parliament should consider closely the relationship between the proposed capitalisation of the company and the reasonable cost of the proposed work.

It is usual to restrict the amount of debenture in tramways to a quarter of the paid-up capital; but this is very little, if any, protection to the investor, as it is only necessary to make the share capital large enough to obtain debenture capital far beyond the value of the property. The necessity for the consideration of this matter by the committee is shown by an examination of the capital cost of tramways in the United Kingdom, without considering the debentures.

The tramway returns show that for every mile of tramway constructed in this country 15,000*l.* has been spent, which is about three times as much as a single mile of any ordinary tramway should cost to construct—that is to say, expenses other than those of construction and engineering, upon which a dividend could be earned, have gone in ways which have purchased no tangible asset. This money, nevertheless, has to be reckoned when the price of fares and rates have to be arranged. At the present moment no less than 1,750,000*l.* spent on tramways in Great Britain pays no dividend at all, and without doubt the chief cause of this is the disproportion between capital and true cost. The Acts for these tramways were obtained because "the construction of the same would be to the public advantage." The best advantage to the public in this case would be cheap fares, but such a very high capitalisation made it impossible to realise this from the first. The committee should therefore consider the relation between capital and reasonable cost, especially in connection with unopposed Bills.

Opposition.—It has been a common thing in the past for a promoter to be placed in such a position that he must either accept the clauses demanded by a wealthy and powerful opposition, and so do away entirely with the value of his Bill, or

abandon it. Even should he decide to fight it, his opponents have the power to extend the period of opposition for such a long time in both Houses that they can impose a burden in capital expenditure on the undertaking, which is so heavy that it cannot be borne without being seriously prejudicial to the advantages obtained from the Act. Opposition of this kind, even when the committee decide that the Bill would afford things "to the public advantage," cripples the undertaking and only gives the public something to which they may subscribe and upon which they may lose their money. The prayer is granted, but the grant is worse than useless as far as any public advantage is concerned. It is therefore very important that if the present system is continued, the powers of the committee, to make the losing opposition pay the whole cost of the inquiry, should be much more strongly enforced, especially if there should be any proof during the inquiry that the opposition is frivolous or due to mainly personal interest.

The enormous cost of obtaining the powers to construct the Manchester Ship Canal is a good example in connection with this argument. This Bill would never have become an Act had not the promoters been able to show the committee that the then existing monopoly, enjoyed by the railway companies, enabled them to charge a rate which was detrimental to the trade of Manchester and district, especially as this scheme was almost without precedent. The opposition, as subsequent events have proved, was clearly for the purpose of maintaining a harmful monopoly, and this Bill would never have been promoted except as a consequence of the existence of this combination, or, being promoted, would have cost a comparatively small sum to comply with Standing Orders. The committee, in giving their decision, might therefore very properly have ordered the various railway companies to pay the cost of the inquiry.

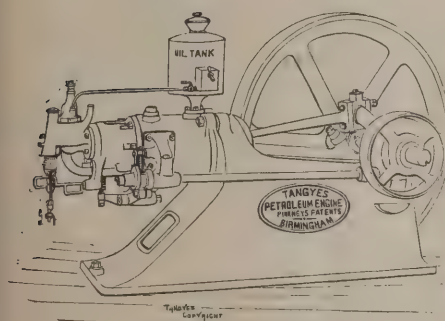
Delay.—The length of time at present absorbed in obtaining powers by means of private Bills or provisional orders might not perhaps be advantageously shortened to any considerable extent for the public works for which they are mostly required. There is, however, something very unreasonable in the system which makes it necessary to occupy half a year to get Parliamentary permission to carry out a project to which all the local authorities concerned have given consent. It is also absurd that the same length of time and the same machinery should be necessary to get permission to make a 10,000*l.* tramway as to make a 100,000*l.* railway.

Board of Trade Powers.—For the foregoing reasons it is

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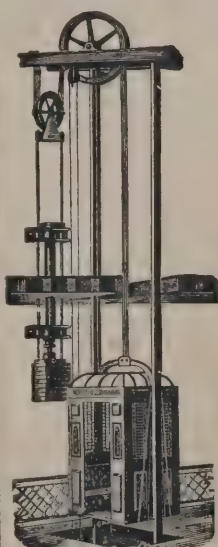
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clearly necessary that powers should be obtainable for the minor projects by some shorter and more rapid means of legislation. The authors therefore suggest that the Board of Trade should be given the power to hold local inquiries and grant permission to carry out schemes, just as the Local Government now conduct inquiries, and without the delay necessarily entailed for a confirmation Act. This would very materially assist enterprise on tramroads and other works, and would make it possible for a small tramroad company to proceed as cheaply as a private owner can with a line on his own property.

It is, moreover, desirable that private Bill procedure should be so amended that not only shall less of the time of those who may be called on to give evidence be wasted, but it should not be necessary to bring witnesses to London from Ireland and Scotland for the purpose.

As an example of the necessity for more freedom in the exercise of discretion with regard to mechanical and minor matters affecting tramroads, it may be mentioned that whilst every Tramway Act permitting the use of mechanical traction requires all steam locomotives to be fitted with automatic speed governors and brakes, a requirement which the Board of Trade officers are bound therefore to enforce, no such requirement is demanded by them with regard to electrical tramcars. They do not feel bound to enforce it because electric locomotives are not steam locomotives. Part of the South Staffordshire tramways is worked by seventeen electric motor cars weighing six tons each, where formerly it was worked by steam locomotives. On this piece of line no such automatic governors and connected brakes have ever been found necessary, neither have they at Leeds or Blackpool.

Clauses such as these inserted in Tramway Acts hamper the engineer in the proper working of a line, and the Board of Trade official becomes a mere clerk of works following a specification, whereas he should be free to insist on or to relax provisions with regard to mechanical details according to circumstances and to the requirements of the case as affected by progress in construction and by the demands of a district or by the kind of traffic.

The case of the Longton extension of the North Staffordshire Tramways is another of many examples showing the necessity for change with regard to the Board of Trade and the clauses in various Acts. The provisional order for this line was obtained after inspection and report by a Board of Trade inspector, but after the line was completed at a cost of about 25,000% the Board of Trade refused to pass it, because one

street through which it passed was below statute width, and with the result that although the Longton Town Council has done its best to get the Board of Trade to relax its requirements, yet that 25,000% of capital has been completely lost, and the inhabitants of Longton complain to this day of the want of tramway facilities.

It may not be necessary, but it will perhaps be as well to state that the authors have no intention of suggesting that the private interests of the promoter or promoters should ever be allowed to weight in the least as against the similar interests of individuals. They think, however, it is clear that, inasmuch as no public work of the kind here referred to should be permitted unless of public advantage, facilities should be granted for the promoters to show public advantage and merit before the opposition of the individual steps in.

It must further be pointed out that inasmuch as the promoter of a tramroad could not proceed without the consent of the majority of the inhabitants, it would be to the public advantage that the merits of a scheme should be considered before opposition to it is taken. In this way much of the vexatious opposition which at present adds greatly to the cost of a project would be avoided, and some of the agreements extracted from promoters before Standing Orders, and kept secret afterwards, would never have to be entered into. The private interests of individuals must be carefully guarded as now, but it is most desirable that when a scheme is declared to be a necessity and of public interest, that the merits of that scheme should be first examined, and if endorsed, then the objections should be heard with the object of modification so that objections may be protected and satisfied. If the wish of the public as shown by its consent is that a scheme should be carried, its rejection should not as now be based on the objections of a few individuals unless it can be shown that injustice would otherwise result. The authors are not suggesting any new form of legislation, this procedure being the universal order of procedure in France, and one which is also largely adopted in Belgium in connection with its numerous secondary railways and tramroads.

The result of this policy abroad is, for instance, in Belgium with a population of about six millions, that in addition to their extensive system of railways (which is greater in mileage per head of population than that of Great Britain), they have at the present moment 730 miles of light railways working, 40 miles in construction and 900 miles projected to be constructed, representing a capital of 4,888,000% or nearly 1% per head. It

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may be suggested, therefore, that under reasonable legislation there is, on the same estimate, employment for about 35,000,000*l.* of capital in Great Britain on light railway and tramroad works. In 1893 the mean dividend paid on all the Belgian lines was equal to 2·8 per cent.

A SUB-CONTRACTOR'S ACTION.

THE case *Ryder v. Walton* came before Mr. Justice Charles at the Durham assizes. The plaintiff, Albert Ryder, claimed that on and subsequent to March 1894, he, at the request of and for the defendant Thomas Walton, did work in and about the dressing of stonework for Stanley Church, near Crook, and the defendant became liable to pay the plaintiff a reasonable price for the work so executed and for materials supplied, and a reasonable sum for the said work and materials now payable by the defendant to the plaintiff amounted to 342*l.* 10*s.* 7*d.*, which included 11*l.* 3*s.* 5*d.* extras, less 204*l.* 10*s.* paid by the defendant to plaintiff on account, leaving 138*l.* 0*s.* 7*d.* Plaintiff alleged that it was agreed that the whole of the new work had to be done at the plaintiff's yard, and the defendant to do all the cartage, but later it was agreed that in consideration of the plaintiff waiving his right to have the new work done in his yard, the defendant agreed to keep the plaintiff supplied with enough stone for fifteen men, and enable the plaintiff to get the work done quickly. The plaintiff commenced the work in accordance with the contract, and was ready and willing to carry out and complete the work, but the defendant did not keep him supplied with stone as quickly as required, and wrongfully took the work out of the plaintiff's hands and employed other men to do the same, and wrongfully repudiated his contract with the plaintiff, and exonerated and discharged the plaintiff from a further performance of the same, whereby the plaintiff lost the benefit of the contract. The plaintiff, in short, claimed 138*l.* 0*s.* 7*d.*

The defendant's defence and counter-claim was that plaintiff did not fully carry out his contract, but on or about July 5 abandoned the work, and withdrew his workmen and tools from the place. The defendant denied that he agreed to keep the plaintiff supplied with enough stone for fifteen men, and enable the plaintiff to get the work done quickly. The defendant did, in fact, supply the plaintiff and kept his men fully employed. He denied that he ever took the work out of the hands of the

plaintiff or repudiated his contract with the plaintiff. Defendant had, in fact, paid the plaintiff 204*l.* 10*s.* on account of the materials supplied and work done. He contended that by reason of the plaintiff's breach of contract he had suffered damage, and had to employ other workmen at a cost of 150*l.* 0*s.* 11½*d.* to complete the work contracted to be done by the plaintiff. Defendant had also had to pay extra carriage on stone to the amount of 24*l.* 14*s.* 6*d.*, obtained at plaintiff's request, from Denwick, near Alnwick, which extra carriage plaintiff agreed to pay. The said two sums, with the 204*l.* 10*s.* paid to the plaintiff, made a total of 379*l.* 5*s.* 5½*d.* actually paid by the defendant in respect of the contract, and the defendant claimed to recover from the plaintiff 88*l.* 18*s.* 3½*d.*, being the difference between that sum and the sum of 290*l.* 7*s.* 2*d.*, made up of the 288*l.* contract price and 2*l.* 7*s.* due to the plaintiff in respect of extras admitted.

Mr. Manisty, in opening the case, said there were two questions for his lordship to decide. First of all the question of whether or not the contract was broken by the plaintiff or by the defendant; if it were broken by the defendant they claimed on a point of merit. There was a special contract in the case, and if it were repudiated or broken by the defendant so as to entitle them to treat the contract as reasonable, then they were entitled to payment on point of merit.

Mr. Waddy said the case was purely a question of fact; there was no law in it.

Mr. Manisty thereupon proceeded to narrate the facts of the case, and said that the defendant had contracted to do the whole of the works in connection with the repair of Stanley Church. He sub-contracted with the plaintiff to 'do the stone work, and agreed that the interior was to be of Denwick stone, and the exterior of Witton-le-Wear stone. Plaintiff's tender was put in the form of the following:—"I hereby offer and agree to execute the whole of the labour in dressing of the whole stone-work for the above in accordance with plans and specifications to the entire satisfaction of the architects for the sum of 288*l.*" Stanley Church was two miles from Crook, at a considerable elevation above Crook, and though it was in that agreement also stipulated that the plaintiff should do the stone-dressing at his own place in Crook, it was afterwards agreed that the plaintiff should have his men on the spot at the church and there dress the stone. That being so it was important that the plaintiff should get the work over as rapidly as possible, as he would have to be away from his own shop, and the defendant undertook that he would keep plaintiff supplied with sufficient

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stone to keep fifteen men going continually to complete the work in six weeks. But it turned out that at no time was there sufficient stone for the plaintiff to keep fifteen men going, and he never had more than thirteen at any time.

Albert Ryder, the plaintiff, stated he carried on business at Crook, about two miles from Stanley Church. To the latter place it was all uphill from his place, and on an elevation of something like 600 feet higher. Speaking of his offer to the defendant, he said they agreed that he should do the interior of Denwick stone and the exterior of Witton-le-Wear stone. They subsequently arranged that the contract should be varied, and that the work was to be chiselled in the premises of the church. Defendant spoke of getting the nave finished in six weeks, and they having calculated that to do that they must have fifteen men going, defendant agreed to keep fifteen men supplied with stone to work. They never had sufficient stone to keep fifteen men supplied. He constantly grumbled about the short supply of stone. On June 20 and between that day and July 5 a rolley load of stone was sent daily, which was not half enough. In answer to his lordship, witness said he never did have fifteen men. He had never more than thirteen, and the average was nine; the reason he had no more engaged was because he could not get stone enough. A rolley load of stone was not enough to keep six men going. He complained to Walton between the dates named, and on July 3 he had a discussion with the defendant as to the payment of 5*l.* 2*s.* extras ordered by building committee. On Thursday morning, July 5, at nine o'clock, he was going along the road, and passed a load of stone going in. When he got up to the church he found the men doing practically nothing, and including the rolley load which he had passed, the men had finished the whole of the stone on the place by one o'clock, showing that there was a very insufficient supply. There was that day no raw stone for the men to go on with; and the men demanded their money. Plaintiff then went down and saw the defendant at his yard in Crook, and told him that the job was stopped for stone and the men were asking for their money. Defendant and he tried to persuade the men to go back, and defendant took them into a public-house and stood two rounds and plaintiff stood one. Defendant then went away. Plaintiff at no time intimated to the defendant that he was throwing up the job. Plaintiff did not pay all the men off that night, but he paid all off but two and a boy, those whom he paid being the men who refused to go on any longer. Next morning plaintiff went up to work with his son, and took a cart for the tools of the men who had

stopped work the previous day and refused to go on again. When he got there he was joined by his apprentice. They were all in their working clothes. When he got up he found three men in the shed, who had started work. They were three of the men he had had working for him the day before. Plaintiff put his tools into the cart. He placed the matter in the hands of a firm of solicitors.

Before plaintiff was cross-examined it was announced that the litigants had consented to the withdrawal of the case, no conditions being stipulated in open court.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

4532. Richard James Threlfall and John Dove, for "A door and window safeguard wedge."

4549. John Shanks, jun., for "Improvements in water-closets."

4643. Henry Lomax, for "Improvements in window-blind rollers and appliances for operating and controlling window blinds."

4647. Lionel Cresswell, for "Improved apparatus applicable to domestic and other fireplaces."

4651. Richard Varley Horsfall, for "Improvements in or relating to chimneypots."

4653. Samuel Bartlett, for "Improved means for regulating the raising and lowering of window sashes."

4659. Alfred Julius Boulton, for "Improvements in basins for sanitary apparatus"

4738. Arthur Murray, for "Sash fastener and lock."

4772. John Henry Hamilton, for "Improvements in water-closets."

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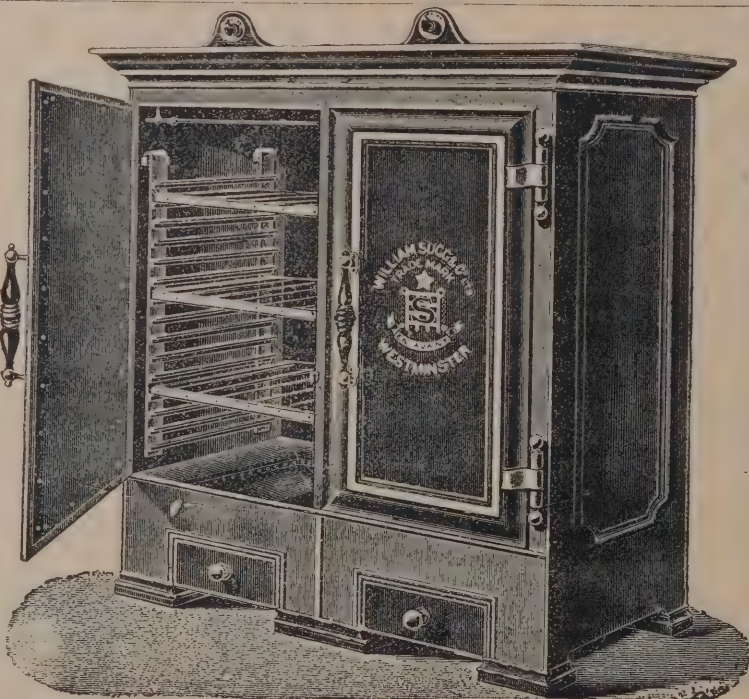
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ABERTILLERY.—March 30.—For Construction of Reservoir, Filter Beds, &c. Mr. Togarmah Rees, Engineer, Corn Exchange Chambers, Newport, Mon.

ABERTILLERY.—April 15.—For Building Schools. Mr. Geo. Rosser, Architect, Victoria Buildings, Abercarn.

ACCRINGTON.—April 3.—For Seating Fittings, &c., for Technical School. Mr. Henry Ross, Architect, 15 Cannon Street, Accrington.

ACTON.—April 2.—For the Construction of a Sewer. Mr. D. J. Ebbetts, 242 High Street, Acton.

ASHTON-UNDER-LYNE.—For Building Fifty Houses. Mr. T. D. Lindley, Architect, 150 Stamford Street, Ashton-under-Lyne.

BACUP.—April 3.—For Building Municipal Buildings. Mr. J. W. Beaumont, Architect, 10 St. James's Square, Manchester.

BARNSTAPLE.—April 2.—For Building Boundary Walls, Bridge, &c., at the Cemetery. Mr. F. W. Petter, Bridge Buildings, Barnstaple.

BELFAST.—April 11.—For Constructing Main Conduit. Mr. Richard Hamilton, Waterworks Office, Royal Avenue, Belfast.

BISHOPSTOKE.—March 30.—For Building Schools. Messrs. Cancellor & Hill, Architects, 14 Jewry Street, Winchester.

BLACKBURN.—March 29.—For Extension of Church Higher Grade Schools. Messrs. Stones & Gradwell, Architects, 10 Richmond Terrace, Blackburn.

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BURNLEY.—For Building Four Houses. Mr. C. Parsons, 9 Grimshaw Street, Burnley.

CARDIFF.—April 5.—For Reconstructing Offices. Mr. Henry Morley, Engineer, Gas Works, Cardiff.

CARLISLE.—For Building Boundary Wall. Mr. H. H. Hodgkinson, 45A Scotch Street, Carlisle.

CHYANDOUR.—April 2.—For Building Police Station, &c. Mr. Oliver Caldwell, Architect, Victoria Square, Penzance.

COGENHOE.—April 4.—For Building Schools. Mr. H. H. Dyer, Architect, 1 Sheep Street, Northampton.

DENTON.—April 8.—For Building House and Chapel. Mr. C. H. Newton, District Council Office, Denton, Lancs.

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HEMSWORTH.—April 3.—For Building Two Cemetery Chapels, Entrance Lodge, &c. Mr. Richardson, 28 Bond Street, Leeds.

HIGHAM FERRERS.—For Building Stores and House. Mr. H. Adnitt, Architect, Harborough Road, Rushden.

HOYLAND.—April 3.—For Building Four Cottages. Mr. J. W. Wilson, 169 King Street, Hoyland, near Barnsley.

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For Rebuilding Premises in Fulwood's Rents, Holborn, for Mr. H. T. Culliford. Mr. F. T. W. GOLDSMITH, Architect, 1 Verulam Buildings, Gray's Inn. Quantities by Mr. J. F. BULL, 30 Bedford Row.	
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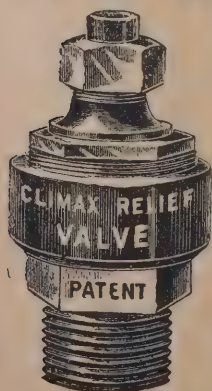
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Barnes & Co., Cardiff	257	5	2
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S. W. Gibson, Eynsford	2,492	10	0
Tuff & Miskin, Rochester	2,470	2	6
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Peill & Sons, Bromley	2,134	10	0
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Section 4.—Bromley.

Tuff & Miskin	1,807	0	0
Kent Road Co.	1,590	10	9
E. B. Chittenden, West Malling	1,575	4	2
Peill & Son	1,431	17	6
T. West, Farnborough	1,273	11	2
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Section 6.—Rochester.

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TUFF & MISKIN (accepted)	1,579	0	0

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Kent Road Co.	1,270	15	0
TUFF & MISKIN (accepted)	1,139	5	0

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J. Ellis & Co., Maidstone	1,001	13	4
Kent Road Co.	958	2	6
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MILTON RURAL DISTRICT COUNCIL (accepted)	871	14	0

MAIDSTONE—continued.

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Kent Road Co.	719	15	0
Bensted & Lake	710	8	4
TUFF & MISKIN (accepted)	686	10	0

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Peill & Sons	1,189	6	8
Tuff & Miskin	1,165	4	2
Kent Road Co.	1,153	7	6
E. B. Chittenden	1,049	5	0
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Kent Road Co.	1,462	10	6
H. Wellband, Otford	1,431	4	0
Peill & Sons	1,429	15	0
P. Bagwell, Sevenoaks	1,379	0	4
E. B. Chittenden	1,343	3	6
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Section 14.—Tonbridge.

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P. Bagwell	771	3	9
Tuff & Miskin	749	10	0
E. B. Chittenden	738	19	2
Kent Road Co.	736	11	3
W. & G. Arnold, Frant	720	2	6
F. PLAYFOOT, Edenbridge (accepted)	665	18	9

Section 15.—Tonbridge.

E. B. Chittenden	2,307	8	4
J. Wells	2,284	15	11
W. Lambert	2,175	3	9
Kent Road Co.	2,165	10	0
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MAIDSTONE—continued.

Section 16.—Tonbridge.

Tuff & Miskin	£2,182	0	0
E. B. Chittenden	2,090	11	8
Kent Road Co.	1,923	12	10
J. Wells	1,903	5	10
J. Ellis & Co	1,822	16	8
W. & G. ARNOLD (accepted)	1,743	3	4

Section 17.—Tonbridge.

W. Lambert	2,774	7	0
Kent Road Co.	2,347	13	4
Tuff & Miskin	2,310	0	0
W. & G. Arnold	2,250	10	0
J. ELLIS & Co. (accepted)	2,140	16	8

Section 18.—Malling.

G. Brotherwood	394	12	4
W. Lambert	386	5	0
Kent Road Co.	377	10	0
Tuff & Miskin	375	0	0
J. Wells	367	15	10
E. B. CHITTENDEN (accepted)	333	16	8

Section 19.—Malling.

Tuff & Miskin	2,209	19	2
Kent Road Co.	2,199	8	9
J. Ellis & Co.	2,167	0	0
E. B. CHITTENDEN (accepted)	2,137	17	6

Section 20.—Malling.

W. Lambert	2,458	9	6
Kent Road Co.	2,207	17	6
Tuff & Miskin	2,198	12	6
E. B. Chittenden	2,142	14	6
J. ELLIS & Co (accepted)	2,058	0	0

Section 21.—Maidstone.

J. Ellis & Co.	1,262	7	6
E. B. Chittenden	1,219	15	0
W. Lambert	1,184	7	6
Kent Road Co.	1,174	15	0
W. & G. Arnold	1,174	2	6
Maidstone Rural District Council	1,160	0	0
TUFF & MISKIN (accepted)	1,119	5	0

MAIDSTONE—continued.

Section 22.—Maidstone.

E. B. Chittenden	£848	10	0
W. Lambert	806	2	6
J. Ellis & Co.	799	0	0
W & G. Arnold	783	0	0
Maidstone Rural District Council	740	0	0
Tuff & Miskin	737	6	0
KENT ROAD Co. (accepted)	733	10	0

Section 23.—Maidstone.

E. B. Chittenden	1,153	3	4
Maidstone Rural District Council	1,145	0	0
Kent Road Co.	1,105	0	0
W & G. Arnold	1,060	3	4
J. Ellis & Co.	1,047	1	8
W. Lambert	1,027	15	0
TUFF & MISKIN (accepted)	1,018	6	0

Section 24.—Maidstone.

E. B. Chittenden	1,617	10	10
W. Lambert	1,567	19	6
J. Ellis & Co.	1,560	0	0
W. & G. Arnold	1,552	4	2
Maidstone Rural District Council	1,530	0	0
Tuff & Miskin	1,413	0	5
KENT ROAD Co. (accepted)	1,368	17	6

Section 25.—Cranbrook.

W Lambert	2,491	16	0
J Ellis & Co.	2,481	0	0
W & G. Arnold	2,419	11	8
Kent Road Co.	2,292	10	0
TUFF & MISKIN (accepted)	2,249	0	0

Section 26.—Cranbrook.

J. Ellis & Co.	1,426	10	0
W. Lambert	1,406	0	0
W. & G. Arnold	1,379	5	0
Tuff & Miskin	1,305	0	0
KENT ROAD Co (accepted)	1,290	10	0

Section 27.—Cranbrook.

Cranbrook Rural District Council	1,406	11	8
J. Ellis & Co.	1,390	0	0
Tuff & Miskin	1,374	0	0
W. Lambert	1,349	10	0
W. & G. Arnold	1,318	10	0
KENT ROAD Co. (accepted)	1,267	10	0

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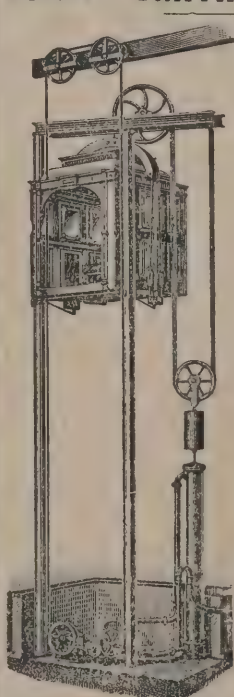
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MAIDSTONE—continued.*Section 28.—Hollingbourne.*

Kent Road Co.	£963	0	0
N. Marley	922	6	0
R. L. Knight & Co., Limited, Sittingbourne	898	16	8
Bensted & Lake	890	10	0
Hollingbourne Rural District Council	885	5	0
J. Ellis & Co.	884	10	0
TUFF & MISKIN (accepted)	868	6	8

Section 29.—Hollingbourne.

Kent Road Co.	1,081	10	0
N. Marley	1,060	11	8
R. L. Knight & Co., Limited	1,042	4	2
Tuff & Miskin	1,039	10	0
A. L. Tapley, Bearsted	998	10	0
H. Chapman, Lenham	979	8	4
J. Ellis & Co.	971	10	0
HOLLINGBOURNE RURAL DISTRICT COUNCIL (accepted)	967	5	0

Section 30.—Hollingbourne.

E. B. Chittenden	1,871	15	0
W. Lambert	1,810	2	6
L. Tassell, Ulcombe	1,758	0	0
Hollingbourne Rural District Council	1,683	0	0
Kent Road Co.	1,655	10	0
Tuff & Miskin	1,617	10	0
J. ELLIS & Co. (accepted)	1,578	5	0

Section 31.—Hollingbourne.

Kent Road Co.	555	0	0
E. B. Chittenden	542	15	0
Bensted & Lake	515	0	0
N. Marley	513	0	0
Hollingbourne Rural District Council	494	0	0
Tuff & Miskin	493	0	0
H. Chapman	483	16	8
J. ELLIS & Co. (accepted)	477	11	8

Section 32.—Faversham.

W. Clark, Ospringe	902	11	8
Kent Road Co.	816	5	0
Tuff & Miskin	737	10	0
FAVERSHAM RURAL DISTRICT COUNCIL (accepted)	686	13	4

MAIDSTONE—continued.*Section 33.—Faversham.*

Kent Road Co.	£1,533	0	0
Tuff & Miskin	1,424	0	0
FAVERSHAM RURAL DISTRICT COUNCIL (accepted)	1,261	6	8

Section 34.—West Ashford.

W. Lambert	1,250	5	0
Kent Road Co.	1,097	17	6
E. B. Chittenden	1,014	5	10
J. Ellis & Co.	985	7	6
Tuff & Miskin	969	1	8
W. & G. Arnold	960	3	4
H. Chapman	939	10	0
WEST ASHFORD RURAL DISTRICT COUNCIL (accepted)	905	5	0

Section 35.—West Ashford.

W. Lambert	1,385	13	9
E. B. Chittenden	1,310	9	2
J. Ellis & Co.	1,231	18	4
Kent Road Co.	1,224	15	0
West Ashford Rural District Council	1,141	5	10
TUFF & MISKIN (accepted)	1,133	7	6

Section 36.—East Ashford.

W. & G. Arnold	1,434	8	10
Kent Road Co.	1,274	14	6
Tuff & Miskin	1,245	0	0
EAST ASHFORD RURAL DISTRICT COUNCIL (accepted)	1,181	2	2

Section 37.—East Ashford.

W. & G. Arnold	772	15	0
Kent Road Co.	688	2	6
Tuff & Miskin	636	12	6
EAST ASHFORD RURAL DISTRICT COUNCIL (accepted)	595	7	6

Section 38.—East Ashford.

W. & G. Arnold	726	5	0
Kent Road Co.	640	7	6
Tuff & Miskin	593	7	6
EAST ASHFORD RURAL DISTRICT COUNCIL (accepted)	572	7	6

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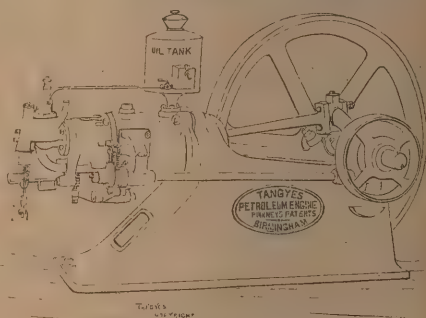
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For Rebuilding the Coach and Bell Inn. Mr. A. T. G. WOODS, Architect.			
Dowsing & Davis	£2,155	0	0
Rogers & Robson	2,105	0	0
Hammond & Son	2,065	0	0

SOUTHALL.

For Constructing Two New Settling Tanks, Filtering Tanks, Tumbling Bay, &c., at the Sewage Works, Wyke Green, Isleworth, for the Southall-Norwood Urban District Council. Mr. THOMAS NEWELL, Engineer, Southall. Quantities by Messrs. YOUNG & BROWN, 7 Southampton Street, Bloomsbury Square, W.C.			
B. E. Nightingale, London	£1,073	0	0
T. Adams, Wood Green	1,049	0	0
Wilkinson Bros., Finsbury Park	963	0	0
J. R. Hunt, Hayward's Heath	936	0	0
G. Pierce, Brentford	918	12	2
S. Kavanagh, Surbiton	909	0	0
M. O. Kitteringham, Enfield	820	0	0
W. BROWN, Southall (accepted)	788	10	0
Engineer's estimate	875	0	0

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For Building Christ Church Infants' School. Messrs. JOHN KIRK & SONS, Architects, Dewsbury.			
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R. Oldroyd, Ossett, mason.			
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T. Brear, Dewsbury, slater.			
R. W. Clegg, Ossett, plasterer.			
H. Sanderson, Ossett, painter.			

WATFORD.

For Sewering and Making Rosslyn Road. Messrs. HUMBERT, SON & FLINT, Surveyors, Watford and London.			
E. Rogers & Co., London	£740	0	0
T. Adams, Wood Green	656	0	0
W. J. Griffin, Northwood	588	0	0
F. Dupont, Watford	570	0	0
G. R. Mann, Edgware	537	0	0
G. Blizzard, Chorley Wood	525	0	0
W. JUDGE, Watford (accepted)	515	0	0

WATFORD—continued.

For Levelling, Sewering and Making Acme and Leavesden Roads. Messrs. HUMBERT, SON & FLINT, Surveyors, Watford, and Lincoln's Inn, London.			
Clifford & Gough, Watford	£566	0	0
G. Pitkin, Bushey	554	0	0
W. J. Griffin, Northwood	550	0	0
F. Dupont, Watford	545	0	0
G. Mann, Edgware	530	0	0
G. Blizzard, Chorley Wood	495	0	0
W. JUDGE, Watford (accepted)	475	0	0

SPRING NOVELTIES.

WITH the return of spring comes the display in our shop-windows of those products of the factories, both English and foreign, which have for many months been engaging the close attention and thought of artist, manufacturer and workman, and it is with no little interest that we pass from window to window in our chief thoroughfares to note the direction in which these efforts have been directed. We are glad to see that the English designer more than holds his own, and that, while the foreigner is satisfied to repeat and repeat what he has done for many a year, our own manufacturer is bringing to the front that freshness which makes us feel that we are not merely living, but growing. Among these new productions wall-papers keep very much to the front, and it is to such houses as Jeffrey & Co., the well-known paper-stainers, of 64 Essex Road, Islington, that we look to show us the latest phase of thought in this direction, and withal to give us that which will beautify our homes at a small cost. We lately had the opportunity of visiting their factory, and were much interested in finding that they had added a very spacious showroom, where they had a grand display of such wall-papers as we have been referring to, and when we say that the designers of these include such well-known names as W. Crane, Lewis F. Day, Heywood Sumner and Stephen Webb, all members of the Arts and Crafts Exhibition Society, it is but saying that their showroom becomes an exhibition in itself and that it is well worth a visit. We noticed that many of the wall-papers from these artists were quite simple in character and thus come within the range of all buyers, and this remark more especially refers to W. Crane's "Teasle" and "Lily Rose," Heywood Sumner's "Fig and Olive" staircase

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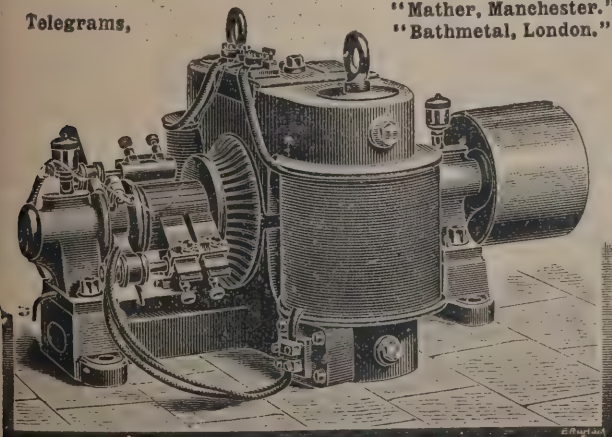
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paper, and also to S. Heywood's "Giant Hemlock" and S. Manson's "Ispahan." The friezes by Stephen Webb which are embossed in high relief should be particularly noticed, for not only are they embossed in leather paper, but Messrs. Jeffrey & Co. have also produced them in embossed copper, and in this form they make beautiful panels above a high wood dado or for introducing as panels in a frieze. The show-room is also rich in the finest wall-papers which are produced; embossed leather papers, lacquered golds and flocks, including the latest novelty in this direction, viz. the "real silk" flocks, which have all the value of silk hangings. But we notice that one part of the room is entirely devoted to their machine-printed papers, which, if we mistake not, were being printed immediately under the floor on which we stood. Such papers, although made in such large quantities that they become quite inexpensive, are of such high order that they lose nothing in effect by being exhibited in close proximity to those which are printed by the more laborious and therefore more permanent process of block printing.

THE BUILDING EXHIBITION.

THE Building Exhibition duly opened on Monday morning, this week. It is satisfactory to be able to state that the evidence of success was visible from the first day. The exhibits are not only attractive, but have sustained the examination of experts. As far as we have been able to ascertain, the visitors to the Agricultural Hall have expressed satisfaction with the show, and we have no doubt that many orders were booked by the exhibitors, and they deserve encouragement for producing so much excellent work. In our issue of *The Architect* of the 22nd we gave particulars of several notable exhibits, and among them those of Ellis, Partridge & Co., Stanley Bros., S. & E. Collier, H. J. & C. Major, John Grundy, Gibbs Bros., L. V. Riley & Co., the Incandescent Gas Light Co., Limited, the Kauri Timber Co., Charles Erith & Co., Robert Adams, John Tann, Arthur W. Adams, the Vitreous Enamelled Glass and Tile Co., Herman & Co., &c.

Somerset Trading Co., Limited.

The Somerset Trading Co., Limited, of Bridgwater, at Stand No. 164, Row F, have a small shed erected and roofed with their improved plain tiles (a specialty with this firm), with barges, hips and valleys. These tiles are manufactured by a patented process under heavy pressure, making them non-porous; they are free from kiln-cracks, tough and of a pleasing colour. Size, $10\frac{1}{2}$ inches by $6\frac{1}{2}$ inches, and if laid to 4-inch gauge 550 cover a square. They also show other roofing tiles of their manufacture, namely, an improved triple angular tile having several advantages over the old pattern; they can be used with battens to different gauges in straight courses or with break-joints; an interlocking double Roman-square shouldered to break-joint; their patent Holdfast double Romans, which cannot be blown off a roof, all being locked together; the ordinary double Roman and triple tiles; Poolet's patent bonding roll, and Phillips's patent Lockjaw tiles; superior machine-made ridge tiles, beaded and ornamental, of various patterns; also, made by a patented process, a variety of finials, moulded, front and string-course bricks with returns, &c.

Frederick Jones & Co.

Messrs. Frederick Jones & Co., of Perren Street, Kentish Town, as usual, have a thoroughly practical exhibit of their well-known silicate cotton specialties for fire-proofing and sound-proofing purposes, for which they have obtained numerous medals and diplomas during the past twenty years. This firm also has an effective display of fibrous plaster slabs, as well as ornamental ceilings, cornices, &c., a branch of their business in which they are now obviously able to compete with the leading houses in the trade. The various fire and sound proofing methods introduced by Messrs. Jones & Co. are well illustrated at their stand by models. The power of silicate cotton to stop the transmission of sound is demonstrated by a wooden box lined with silicate cotton in which an alarm clock is placed—no sound whatever being heard the moment the lid is shut. This firm's patent "combination slabs," i.e. plaster slabs padded on one side with silicate cotton, are especially deserving of attention as a most effectual mode of rendering floors, walls and partitions totally fire and sound proof by one process, and obviating the use of the old-fashioned

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sound-boarding and lath and plaster. The same patent system is also applied to casings, ornamental or plain, for iron columns, girders, &c. When the disastrous effects of the recent frost are painfully fresh in the minds of householders, it may be remarked that silicate cotton applied to pipes and cisterns is a preventive against the effects of frost. Messrs. Jones & Co. have some excellent methods of protecting pipes and cisterns. Their "strips" are so made as to wind spirally round pipes of any diameter, and they will not fail to commend themselves for their cheapness and simplicity.

W. Gooding.

The patent interchangeable rubber stair-treads shown are admirably adapted for railway stations, railway and other carriages, tramcars, omnibuses, footbridges, public buildings, hotels, warehouses, factories, hospitals, schools, theatres, music halls, Turkish and public baths, ships, yachts, aisles of churches, pulpit stairs, office stairs, landings, restaurants, public houses, entrances to shops, private houses, &c. In every case stair-cases for public use get unequal wear, but these patent rubber treads hold their own for years against wear and tear. The rubber treads, speaking from memory, are nearly 2 inches square, and can easily be replaced if worn. According to circumstances the wear and tear may be either central or at the sides. This system gives a safe foothold and is very slight in appearance. It is also inexpensive, the cost of replacing worn rubbers being small and no labour involved.

Ashmore, Benson, Pease & Co., Limited.

This exhibit is of great interest to architects and builders. The principal feature of the exhibit, as we saw it, was the demonstration of the uses of a tubular system for building purposes, for tubular walling, tubular flooring, tubular columns, &c. Pease's patent system of interlocked tubing of thin metal sheeting, it is named. The advantages claimed for the system are too numerous to mention, but among them it may be stated that for walling it is compact, strong and fireproof, without rivets or visible joints, and presents a smooth metal surface. It can be plastered or tiled, is self-supporting over a large span, and useful for ventilating purposes. It may be filled with various materials, and is a strong wall when not filled. For flooring and as columns similar merits are claimed in the way of strength, fire-resisting qualities, &c. This exhibit should be inspected.

Simplex Window Company, Limited.

This firm have received many valuable testimonials in regard to the value of their "Simplex" window-sash fittings, which no doubt may be claimed as the cheapest and simplest means of raising, lowering and fastening a window-sash in the market. One great advantage is that the sash can be cleaned without risk to life.

Marpedo Compound Company.

What is styled "Marpedo" is exhibited by the above company, and should be inspected. It is shown as "the perfect sanitary washable paint," varnishable without size. Of course it is a substitute for oil-paints and processes of distemper, and has great covering powers, as may be expected in all substitutes for oil-paints. Sundry details as described to us have enabled us to recommend "Marpedo" for practical use. Space will not allow of giving any explanations at length. The "Marpedo" is a washable paint. Samples of it are shown, but nearly every shade of tint and colour may be obtained.

Shanks & Co.

Messrs. Shanks & Co., of Barrhead, Glasgow, and 46 Cannon Street, London, E.C., have as usual a high-class exhibit—an exhibit, it may be said, surpassing the usual degree of interest. In sanitary appliances the firm never rest in devising improvements, and the good work shown one year is bettered in the next year. Baths, lavatories, closets, &c., are shown. In baths, a solid porcelain bath, a *fin-de-siècle* parallel, extra large, and large taper, also a modern taper, modern, and new cheap independent spray. In lavatories, new modern, Imperial and other lavatories, plain and decorated; a new tubal lavatory, with modern waste; range (school), fireclay; range, "Instantan," fireclay; range, "Unus," solid fireclay with marble divisions, automatic tank, &c., complete; folding enclosed urinal, self-acting. In closets, the new Barrhead syphonic, 2 gallons, and same 3 gallons; the new Severn, 3 gallons, shown in action; Imperial combined with syphon cistern, in action. The appliances now shown are characterised by efficiency with great economy as to cost. One or two new closets are shown with lifting mahogany seats, which are quite good enough in appearance, while the price is within the means of a cottager. The closet is a new syphon closet, the one having a flush of 2 gallons and the other of 3 gallons. There is a large water surface. There is a water-seal of 8½ inches, and the closet has a single trap. This latter closet Messrs.

THE NEW REFUSE CART.

SALBERG'S AUTOMATIC SANITARY APPARATUS CAN BE ADAPTED TO

ANY EXISTING DUST CARTS.

REFUSE ENTIRELY HIDDEN. BAD SMELLS PREVENTED. NO CLOUDS OF DUST.
ALL REFUSE IS IMMEDIATELY AUTOMATICALLY DISINFECTED.

"Its simplicity and efficacy excite wonder."—*Morning Advertiser.*

"Commends itself at once as a simple and indeed perfect remedy for the everyday danger of open Dust Carts."—*Daily News.*



SALBERG'S SANITARY BINS.

All Refuse placed in these Bins is
AUTOMATICALLY DISINFECTED.

DISINFECTANT REQUIRES RENEWING ONLY ONCE IN SIX MONTHS.

SOLE PROPRIETORS AND PATENTEES—

F. W. DECKER & CO.,

23 GARLICK HILL, CANNON STREET, LONDON, E.C.

(NEAR MANSION HOUSE STATION)



Shanks & Co. may be justly proud of, for we doubt that at the price a better flushing closet can be found in the market.

Yates, Haywood & Co.

A large space has been taken in the Hall by this firm for the display of their beautiful marble and wood chimneypieces, iron mantel registers, tiled register stoves, fenders, tiled hearths, &c. A feature of the exhibit is their patent "Quadrant" kitchener, which is to be seen in action. It has a lifting fire arrangement of an excellent kind, without rack or catch to get out of order. In addition, it can be used as an open or closed fire; it will burn anthracite coal, and also in the consumption of fuel is very economical.

The Granitic Paint Company.

The samples shown at this stand are well worth attention. The company obtained a silver medal at the Health Exhibition, 1884. The granitic paint has been under trial for thirty-four years and has stood the test successfully. It is adapted for painting of every description, either internal or external; for the finest decorative purposes, or as a preservative for coarse and rough materials. It possesses great fineness, covering properties and durability, has a highly-finished appearance and dries very hard, on which account it is specially suitable to all horticultural purposes. It does not blister, neither heat, moisture, sea air, nor frost, having any effect on it, and is, therefore, particularly suited for tropical or cold countries. It will preserve wood, iron, &c., from rust and decay, and will make joints in ironwork equal to red lead. Some specimens of decorative painting on canvas are shown. These were painted in 1883, and when lately removed the canvas was found quite discoloured by damp, though the painted face is as good as when first done.

The Self-Lock Roofing Tile Company.

A model building, occupying a space of about 16 feet by 17 feet, covered in self-lock roofing tiles in three sizes, viz. 6-inch, 9-inch and 12-inch. These tiles are suitable for mansions, churches, board schools, dwelling-houses, factories, warehouses, farm-houses and public buildings. They are constructed with a special machine, with cement and sand in certain proportions, unskilled labour only being required in their manufacture. The machine can be seen at work in the exhibition. It will be seen that these tiles embrace every advantage of strength, durability, lightness, application, treatment, and cheapness, the cost being about one-third of any

other roofing material now in use, in addition to which the woodwork required in constructing the roof would be 50 per cent. less than that required for the Broseley or other tiles. A guarantee would be given that a roof constructed in accordance with the instructions given by the Self-Lock Roofing Tile Company would be rain and storm proof. They can be used in any climate, and have for years been universally used in America, Canada, and Europe. The tiles can be used for a roof of ordinary pitch, or as low a pitch as one-seventh, and they can also be hung perpendicularly for walls. The usual colours kept in stock are red, blue, or cement colour, but they can be manufactured in any other colours which may be required. It is the intention of the company to sell the machines and grant licenses for the manufacture of the tiles in various parts. We have referred before to these tiles and can only say in conclusion that now that we have seen them fixed we feel convinced that our previous remarks with reference to them were fully justified. The exhibit at the Hall is one of the best in the exhibition. Full particulars of these arrangements can be obtained at the exhibition, or at the offices of the company, 47 Victoria Street, Westminster.

C. D. Phillips.

We refer to Phillips's patent Lockjaw tiles in another paragraph, as manufactured and exhibited by the Somerset Trading Co.

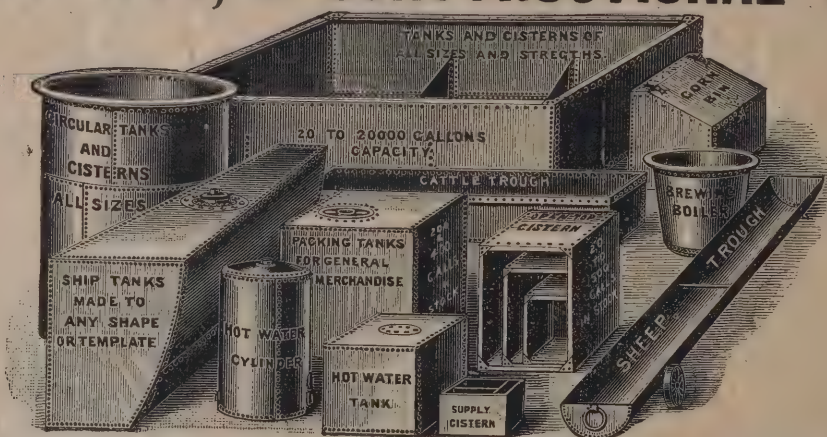
The Anthydor Compound General Paint Company, Limited.

The "Anthydor" is a sanitary paint, being a substitute for oil paint and distemper. It is non-poisonous, odourless, damp-proof and durable, and will not crack or blister through heat or rub off or decompose. The paint has been used in painting all the woodwork of the model building erected by the Self-lock Roofing Tile Company. It can be used either for inside or outside work, and is applicable on either brick or plaster walls, wood or ironwork, and it can be varnished if required without size, when a surface equal to the best enamel is obtained. The compound simply needs the addition of tepid water and is ready for use, when it is cheaper than oil paint by 60 per cent, as 1 cwt. will cover 1,200 super yards. It can be had in any colour and all the newest art shades, and will not fade. It is unsurpassed for either interior or exterior decorations, for either plain colouring or artistic treatment, the colours being intermixable and drying with a perfectly flat and uniform surface. It dries very rapidly, and several coats can be applied in the space

JOSEPH ASH & SON,

MANUFACTURERS OF TANKS, CISTERNS, & CONSTRUCTIONAL IRONWORK.

SANITARY
PANS.



DUST
BINS.

GENERAL GALVANIZERS.

Rea Street South, BIRMINGHAM.
TELEPHONE NO. 474. TELEGRAMS, "TANKS, BIRMINGHAM."

Electrical Novelty

TO ARCHITECTS, SURVEYORS, AND BUILDERS.

Call, or send for Representative to explain the NEW ELECTRIC CHAMELEON SIGN
for FASCIAS, LANTERNS, LAMPS, and HOUSE SIGNS.

SOLE MAKERS—E. L. BERRY, HARRISON & CO.,
Electric Light Engineers, LYRIC CHAMBERS, WHITCOMB STREET, W.C.

of a few hours, and in fact a room can be inhabited an hour afterwards.

The Eagle Range and Foundry Company.

An interesting variety of cooking ranges are shown, and some in operation, at the stand of this company. A special new range will attract the attention of many. It is exhibited in two kinds. A valuable feature is the application of a safety-valve with double action, fusible plug and spring, which, if anything can do so, will secure immunity from the boiler explosions which have been too frequent this winter. The dampers are worked by an extremely ingenious method by rod and handle. The handle shows on an enamel plate whether the damper is set to "fast," "medium," "slow" or "closed," and each oven has its separate damper rod. The ovens are furnished with a glass door in addition to the usual metal door, and the process of the cooking can be inspected without altering the temperature of the oven. A regulator outside shows the exact temperature of the oven. This registering instrument only costs a few shillings, being independent of quick-silver for its action.

W. A. Smith.

Mr. W. A. Smith, of the Midland Machinery Works, Northampton, exhibits an improved horizontal brick, pipe and tile making machine, price 21*l*. What is called a No. 4 machine is provided with many important improvements, and will make solid, perforated or tubular bricks and pipes, either round, egg-shaped or octagonal, from 1 inch to 12 inches diameter when burnt; plain, corrugated, Roman, pan, garden and ridge tiles of various patterns. The cutting-off table is arranged for either bricks, pipes or tiles, and can be easily adjusted to cut off various lengths; double racks and pinions are fitted to this machine, and a second wheel is also supplied free of charge to alter the speed, so that the machine can be worked by either a man or a lad, as may be more convenient. It will produce 6,500 pipes 2 inches internal diameter per day of ten hours, and other descriptions of goods in proportion. The power is applied in the most convenient part of the machine for economical and effective working. Mr. Smith is also maker of Nos. 1, 2 and 3 sizes-similar type machines, at prices ranging from 12*l*. He also exhibits a very compact set of improved clay-crushing rollers for steam or water power, which may be used for crushing marl, stony or rough coarse clays, where it is necessary to reduce them to a fine state previous to their being made into bricks, pipes or tiles either by hand or by machine.

ILLUSTRATIONS.

CORRIDOR, GOSFORD HOUSE, LONGNIDDRY, N.B.

NORTH-EASTERN STATION HOTEL, ENTRANCE HALL.

ENTRY OF ALEXANDER THE GREAT INTO BABYLON.

He also exhibits an improved cutting-off table, portable railway wrought-iron brick-truck on springs, large quantity of dies of all shapes and an assortment of accessories for brickyards and building trades, such as machinery oils, wire, lifting, push and pull screw-jacks, waste, packing, &c. Also an iron table circular saw-bench, which will carry a saw up to 36 inches, the table being 5 feet by 2 feet 8 inches. This saw-bench is of a very massive and heavy description, and is fitted with fast and loose pulleys, striking gear, &c.

Messrs. Freeman Bros.

Messrs. Freeman Bros., 99 York Road, Battersea, patentees and sole manufacturers of the patent "grip-joint" connections for securely joining lead pipes to earthenware, exhibit their patent grip-joint connections, their patent adjustable pedestal water-closet "Turritt," patent junctions for connecting lead soil-pipes, washes, anti-syphon pipes, &c., to iron pipes; the "Triple Alliance," a combination of the three foregoing; "Desideratum" pedestal closets, specially made copper cylinders and boilers for domestic hot-water work, drain-cleansing and chimney-sweeping machines and appurtenances.

Opalite Glazed Brick Co.

The National Opalite Glazed Brick and Tile Syndicate, Limited, of 142 Charing Cross Road, London, W., and 26 Pall Mall, Manchester, are exhibiting some very beautiful specimens of glazed bricks and tiling on a totally new principle. By their letters patent they bring into the market a new material, known as "Opalite," which is manufactured from the finest opal, and by means of a compound cement which they specially make they unite the "Opalite Tablets" to any ordinary brick, and to brick and stud partition walls. The bricks can be handled and applied in the same manner as is usually done with the ordinary glazed bricks. "Opalite" has but to become more generally known to insure its due appreciation from those concerned in the building and equipment of

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22 & 23 SOHO SQUARE, LONDON. W.

P. WAHLMAN'S JOINERY CO., LIMITED,
GEFLE, SWEDEN. (ESTABLISHED 1876.)

Manufacturers of SWEDISH WOODEN HOUSES and VILLAS.

WARM, CHEAP,

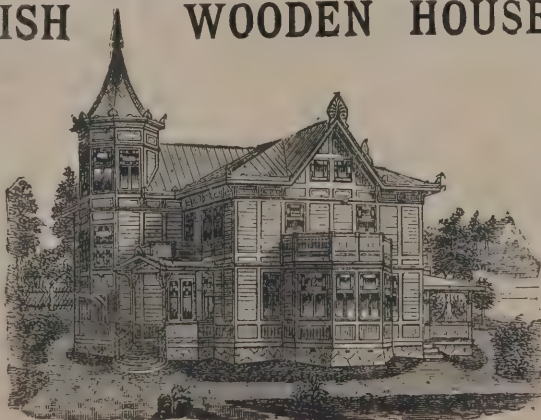
AND OF THE

BEST MATERIAL.

LOWEST ESTIMATES

GIVEN FOR

ANY SIZE AND DESCRIPTION.



Excellent Shooting and
Fishing Pavilions.

AGENTS:

C. J. EKMAN & CO.,
24-25 FENCHURCH STREET,
LONDON, E.C.

hotels, clubs, cafés, hydropathic establishments, restaurants and other public buildings. It will also be found most suitable for the embellishment of the interiors of confectioners' shops, dairies, bakehouses, corridors, bathrooms, lavatories, kitchens, larders and other domestic offices; in fact, wherever permanent decoration, combined with beauty in design, durability and cleanliness, are concerned. Among the many special advantages claimed for this new material is its great superiority over the ordinary tile and glazed brick of the present day, for whereas work constructed of these last-mentioned materials fails in its decorative appearance no less than in its durability when used for sanitary purposes, "Opalite," on the other hand, as applied by the Syndicate's process, is ever fresh and new in its appearance, charming in colours and most durable. When we add to this the fact that it can be faced to new or old walls alike by any ordinary bricklayer or plasterer with the same success, while its price is less than ordinary tiling, we feel assured that "Opalite," when brought fully before the public, will be generally adopted, and thereby revolutionise this branch of the decorative building trade. "Opalite" should be found invaluable as a reflecting agent where borrowed light is a necessity, giving as it does a brilliantly polished surface, and surpassing in many respects the reflectors now in common use.

James Adams.

Mr. James Adams, Stand No. 139, Row E, inventor of the original pneumatic check and spring for the floor, exhibits his latest improvements, which are worthy of special attention. One is a neat back spring for doors, which can be readily charged against boisterous winds. This should interest licensed victuallers, who have doors in exposed positions. Another, silent-closing door springs, which he has named the "City," contains advantages which have long been required. Among his other exhibits are the single and double action pneumatic check springs well-known as the "Slave" patent, and the shallow well, adjustable, double-action spring hinge; also a very neat sash-fastener, which defies the burglar's knife, and will lock the window open for ventilation. Architects and users of door springs will not regret paying a visit to this stand.

Tangyes, Limited.

Show gas-engines at work on the "Otto" principle (Pinkney's patents); also an engine worked by oil; also a selection of lifting screw and hydraulic jacks, rope and chain

blocks, pumps and other builders' tackle. The petroleum (or "oil") engine is specially suitable for farm-servants, whose duty is not supposed to consist necessarily in experience of mechanical processes. No special oil is actually required. It is easily managed by any person, and no question of insurance has arisen during its use.

King & Son.

The exhibition would scarcely seem complete without one saw the patent honeycomb wine bin of Messrs. King & Son, of Stow Works, Weedon, on view. It consists of a honeycomb of terra-cotta tubes stacked against cellar walls, circular interiorly to fit the bottle, and several-sided exteriorly, which enables them to be stacked to any height with absolute firmness. These receptacles being of terra-cotta, syringing them with water in hot weather would keep the wines very cool.

R. W. Hitchins.

Shows Hitchins' new patent machine-made fibrous slabs, fire-proof slabs, sound-proof slabs, damp-proof slabs, pugging slabs, &c.; patent non-conducting compo for covering boilers, hot flues, steam chests, steam and water pipes, and all other heated surfaces, refrigerators, electric leads, &c.; patent stair coverings for renewing worn stairs, steps, &c., for prevention of slipping, deadening of sound, &c.

Turpin's Parquet Floor Joinery and Wood-carving Company, Limited.

This company still keeps to the front in their excellent works for wood parquetry, both in material and design, and they also have a happy knack in skilfully arranging harmonious combinations of different coloured woods.

Blackman Ventilating Company, Limited.

Two peculiarly interesting exhibits are shown for heating and ventilating purposes. The use of one is for general heating and ventilating of a house throughout; the other is for warming and ventilating separate rooms. Any convenient spot in the basement will serve for the apparatus designed for the whole house. As a combined system of warming and ventilation it is admirable, complete control over the temperature being afforded. Shortly we hope to forget the extremely cold weather, but it often happens in the summer months that the conditions are entirely reversed, and any appliance that will secure a pure atmosphere of cool air is desired, and arrangements are included where necessary for purifying the air before admission to the building. From inspection of the method by

VENTILATION! HEATING!

CHING'S New Patent Silent Mica Valve Ventilator.

MAKERS OF ALL KINDS OF VENTILATORS.

HEATING. Steam, High or Hot Water, Low Pressure.

COMYN CHING & CO., Castle Street, Long Acre, London, W.C.

No. 26.



HALLIDAY'S CLAPTON LIGHTS.

Simple, Powerful, Economical. Reflection and no Complication.

OPEN TOP, AS SHOWN, OR VENTILATING. PLAIN OR ORNAMENTAL.

Much used in Places of Worship, Lecture Halls, Board Schools, Shops, Large Offices, Markets, &c. Suitable for wherever a Very Powerful, Well Diffused, Soft, Economical, and Easily Managed Gas Light is desirable. Made in Five Sizes.

HONoured WITH SUNDRY IMITATIONS.

Seven years from Invention up to April 1890 over 11,300 sent out. But Up to the end of 1893, over 23,000 sent out.

A PERPLEXED GAS INSPECTOR.

"There has been so great a reduction in our consumption of gas at Speke Hall, Battersea, since we had your CLAPTON LIGHTS, that the Gas Company declared our meter must be out of order. They have had it examined, and can find nothing wrong."

R. H., London, September, 1893.

The Gas Light also at this Hall is said to be over twice what it was before.

J. C. HALLIDAY, INVENTOR AND MANUFACTURER,

12 GRAINGER STREET, NEWCASTLE-ON-TYNE.

A LIST of ART PLATES published in "THE ARCHITECT" will be forwarded on application to P. A. GILBERT WOOD, Publisher, 175 Strand.

which these machines play their part in warming and ventilation, and also from inspection of the working drawings, the system must be most satisfactory.

Charles Gay Roberts.

The very useful patent rain-water apparatus is shown at the stand of Mr. Charles Gay Roberts, of Haslemere, Surrey. The apparatus is well known for its extreme utility, especially in country parts, by its procuring a store of pure water, during showers and rains, from roofs of buildings, the ingenious part of the invention being a simple contrivance which sends to the waste all water until the roofs have been thoroughly cleansed of all dirt, soot, dust, &c.

Minton's, Limited.

Show a model structure displaying the excellent arrangements in wall-tiling, &c. Figured panels nicely designed are shown—dados, wall enrichments, &c. Inside the little structure is quite a museum of samples of tile-work, up to the best standard always maintained by this firm.

Joseph Arnold.

At his stand Mr. Arnold invites the attention of waterworks engineers, local boards, sanitary and urban authorities, corporations, &c., to his "Special Filter Sand," being, it is stated, pure silicate, even grain (coarse or fine), free from all impurities, requiring no washing or other preparation before using. It has been supplied to the principal water companies, sewage works, &c., in London and the provinces. Mr. Arnold says it is highly recommended by analysts and engineers for water and sewage filtration. This sand can be had in large or small quantities. Splendid samples are shown, and the system could not be too highly recommended.

Plastic Marble Company.

Among some of the advantages claimed for the patent plastic marble are the following:—That when finished it is part and parcel of the wall, and cannot warp, bulge, or in any way become detached from it; no screws, dowels, &c., required; that it has a hard impenetrable surface, and is specially useful for hospitals, &c., as it does not harbour disease germs; that it is from one-third to one-tenth the price of coloured marble, and when finished experts are unable to distinguish the difference; that there is no risk of breakage or damage in transit from works, as it is made and fixed up on the spot in its plastic state, therefore all risks are avoided; that for covering iron

columns it far surpasses anything else ever yet invented, and can be applied in houses already erected or in course of erection; also for covering walls, dados, skirtings, &c., and for pedestals, panels, chimney-pieces, table-tops, &c.

The Anti-Freezing Air-Valve Company.

A simple but most useful system is shown which has secured the unqualified approval of the New River, West Middlesex, and other water companies throughout the kingdom. This valve being screwed on to a base in the cistern, it is portable, and can be removed from one cistern to another. It is actuated by a bell wire, with catch attached. By pulling down the catch the wire acts upon a lever at the top of the valve; then by turning on the tap any quantity of water can be obtained. Directly the catch is released the valve falls into its seat, the water runs out of the pipes, being replaced by air, which comes through the T-piece as shown on the top of the valve casing, which is packed. By the application of this system the following, amongst many other advantages, will be obtained:—Frozen pipes become an impossibility, as the pipes will always be empty (if the taps are left open), and therefore they cannot burst; if by an almost impossible conjunction of circumstances water did remain in the pipes, they then froze and the pipes burst, still, as the valve in the cistern must be down in its seat, and no more water can come from the cistern, the only trouble would be about a pint of water contained in the pipes would come into the house, instead of the whole contents of the cistern; the valve being at about 2 inches from the bottom of the cistern a pure supply of water can always be obtained without disturbing the sediment at the bottom of the cistern; except in the very severest of all weathers, when the water in the cistern becomes a solid block of ice, there will always be a supply of water from the cistern; the use of this valve absolutely prevents waste by leakage; it is especially advantageous for use in stables and places where cattle are kept.

The Cheerful Fuel-Saver Company

Are exhibiting an entirely new form of economiser, which appears to possess all the necessary qualities for efficacy. By its use the heat, of which so large a proportion usually ascends the chimney, is thrown forward into the room, complete combustion is effected, and a bright cheerful fire produced. It obviates the use of fire-bricks and sides, which it effectually replaces, and the fuel is very largely economised.



SPRINKLER, Closed.

ALL
MILLS, WAREHOUSES, THEATRES AND PUBLIC BUILDINGS
CAN BE RENDERED ABSOLUTELY FIREPROOF BY ADOPTING

THE GRINNELL SPRINKLER

THE ONLY SPRINKLER WITH A RECORD.

Has Extinguished 2,000 Fires with an Average Loss of £50,
Protecting Property to the Value of £120,000,000.

Unlike all other Sprinklers, the GRINNELL is constructed entirely without Springs, Screws, Hinges, and other Mechanical make-shifts, so liable to derangement.

IT IS THE LEADING FIRE APPLIANCE OF THE DAY.

DOWSON, TAYLOR & CO., LTD. LONDON: 14 Victoria St., S.W.

MANCHESTER: Blackfriars Bridge. And at GLASGOW and PARIS.

HARDYS' PATENT

No. 15,811.

For Prices and further Particulars apply to the

SOLE PATENTEES—

MESSRS. H. & J. HARDY,

ALBANY WORKSHOPS,

SWANAGE, DORSETSHIRE.

No. 2.—AUTOMATIC SELF-LOCKING ACTION.



No. 3.—THE SELF-HELP FASTENER.

A large number already in present use giving full satisfaction. Unrivalled. you require them for single or for double casements.

COMBINED STAYS AND FASTENERS FOR CASEMENTS AND FANLIGHTS.

WE beg to call your special attention to our Patent Combined Stay and Fastener, which, from its great advantages and easy mode of use, can well claim a superiority over the common kinds. You will notice that this Fastener has no complex system of working, is easy to fix, and, whether the casement is open or shut, does not project into the room, but hangs down the centre of the sash free from curtain or blind. The advantage of this Patent Fastener is that, being fixed in the centre of the sash, it affords protection against sudden gusts of wind when open, and keeps the sash safely closed when shut, as it acts as a fastener for the casement as well as a stay. Each of the three kinds of Fasteners affords the same advantages in all respects, as, though varying in shape, size, and price, are only different ideas of the same method. These Casement Fasteners can be used both for wood or iron, for single or double casements. The special pattern is used for fanlights to open outwards, and all can be used both for right or left hand. We can supply these Fasteners in any number of links, according to the extent the casement is required to be opened. We may also note that the Fasteners are well made and finished, can be had both in brass and iron, and are, therefore, well suited for any kind of residence. Quotations and further information will be given on application. Also testimonials. Please state in ordering whether



Stay and Fastener shown in Action.

Cases for Binding the Architect.—Price Two Shillings. Office: 175 Strand, London, W.C.

Joseph Lewis.

In reference to the particulars furnished us of this exhibit, published in *The Architect* of March 22, Mr. Lewis writes to make the following correction. He says:—Lines 12 and 13, as far as "&c.," are foreign to the coupling which is being described; they should follow the word "purpose" on line 16 as a distinct and complete sentence.

The exhibitors are quite to be congratulated for their, no doubt, hard labour in contributing to a fine show.

Unavoidably, and in some cases by request, notices of several exhibitors are deferred till next week; but we would recommend that visits should be paid to the exhibits, and among these exhibits, which we trust to refer to next week, we may specially mention those of W. H. Harling (mathematical instruments); Joseph Williamson & Co., of Wellingborough (improved ranges, &c.); G. Shrewsbury (bath-heaters, gas-boilers and portable hot-water apparatus); John Line & Son (artistic wall-papers, &c.); Henry Bassant (parquet flooring); the Bristol Pennant Stone Firms, Limited (well known for their monumental work); T. Freeman, of Phoenix Street, N.W.; the Stourbridge Fire Brick Company; the N. A. P. window; the paragon bolt and various exhibits of machinery, &c.

TRADE NOTES.

THE Borough Hospital, Plymouth, is being warmed and ventilated by means of Shorlands' patent Manchester stoves, with descending smoke flues, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

THE monthly meeting of the London and Provincial Builders' Foremen's Association will be held to-morrow, the 30th inst., at 7.30 P.M. A paper will be read by Mr. Ackerman on "Present-day Apprenticeship."

MR. T. FREEMAN, of 200 and 202 Phoenix Street, N.W., informs us that he no longer does business with Messrs. P. & S. Wood, of West Bromwich, but supplies blue Staffordshire goods of his own make or selection from his stores at St. Pancras Station.

WE understand that Mr. Arthur Rutty has secured the contract from the London County Council to scarify the Victoria Embankment with his improved scarifier to a depth of 8 inches, and his machines will be working there for the next few weeks, so a good opportunity will be afforded of inspecting

them at work, as drawn by traction engine or ordinary steam roller.

A STAINED-GLASS memorial window has been erected in Slebech Church, South Wales. The subject is *Peace, be Still*. It was presented by Sir Charles Philipps, Bart., and Lady Philipps, of Picton Castle, and was executed by Messrs. Alex. Gibbs & Co., of 10 Bloomsbury Street, London, W.C.

VARIETIES.

MR. H. M. HOWE, who is to receive the Bessemer Medal from the Iron and Steel Institute, is the third American selected for the distinction.

MANY of our readers will be glad to know that a European edition of the excellent American *Engineering Magazine*, from which we have given occasional extracts, is published by Mr. George Tucker, 1, 2 and 3 Salisbury Court, Fleet Street, E.C. It is well deserving of acquisition.

MR. SQUAREY has awarded the sum of 7,132*l.* to the Dorking Charity Trustees as the amount to be paid by the Tunbridge Wells Corporation for about fifty acres of land required for sewage utilisation purposes. Originally the claim was about 11,600*l.*

THE Meisenbach Company, Limited, offer 20*l.* in prizes for the three best displayed specimens of an advertisement of their work. It will be confined to printers.

THE QUESTION OF BETTERMENT.

AT the annual meeting of the Association of Municipal Corporations, the president, Sir A. Rollit, M.P., in the course of his address referred to recent action concerning the question of "Betterment." He said that a committee of the Association had been appointed to discuss that difficult question, and had prepared and presented two reports—a majority report in favour of betterment, and a minority report accepting the principle of betterment, but pointing out certain modifications that ought to be observed with regard to its application. That principle was that public improvements effected by the community ought to be available for the benefit of the community, and not primarily, as in the past, for the benefit of individuals; though, on the other hand, the rights

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of individuals ought to be protected. He did not hesitate to say that, owing to the preference given in the past to individuals rather than to the community and to the cost and difficulty of assessing compensation in the case of public improvements, those improvements had been greatly retarded, and that as to railways and other works a heavy public burden and debt had been caused by the high charges that had been incurred with regard to such improvements. Then there was the question of worsement—the injustice of requiring payment for betterment and not recognising compensation for worsement. Ultimately the Council took what he thought was an impartial and wise course in recognising the arguments of both reports and postponing their reception and adoption until more experience had been obtained with regard to the working of the principle of betterment in the various localities, and until it had been ascertained whether it was not possible to so amend existing statutes dealing with the question of compensation for improvements—the Land Clauses Acts, for instance—as to materially minimise the necessity for introducing any new principle by widening the scope of these existing Acts so as to provide both for betterment and worsement. There was no doubt that hitherto compensation had been far in excess of what just requirements rendered necessary. In juries and arbitrations they had to deal with tribunals that in many cases were marked by an unfortunate degree of uncertainty, and the cost of these proceedings was outrageously disproportionate to the claims involved. Provision should be made on one hand that where public authorities were doing work for the public benefit, the burden should not be wholly cast upon the public, while, on the other hand, private rights, wherever they were invaded, should be protected. He hoped some means of settling the question might be speedily found, so that public improvements should be no longer postponed, and that they might no longer see that a measure embodying the principle should be accepted when proposed by the Corporation of Manchester, but should be rejected when proposed by the London County Council. He believed much would result from a careful inquiry into the experience of the various localities with respect to this question. He had great faith in local action. Sir Albert then referred to the great extension in the powers of local authorities which had taken place in the last few years, and expressed the opinion that a still further extension would be witnessed in the immediate future, though he was sorry to say that he had noticed in Parliament some signs of jealousy of these local authorities.

WATERPROOFING BRICKS.

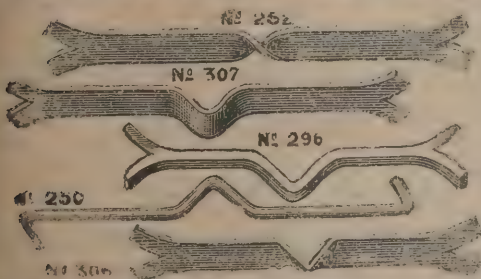
At the recent meeting of the Australian Association for the Advancement of Science Professor Liversidge read a paper on the "Waterproofing of Bricks and Sandstones with Oils." These experiments were made with the view of ascertaining the length of time that bricks and sandstone are rendered waterproof or protected by oiling. The oils used were the three commonest and most readily obtainable for such purposes, namely, linseed oil, boiled linseed and the crude mineral oil known as "blue oil" used for preserving timber. The weatherings were made upon a flat portion of the laboratory roof fairly exposed to the sun and weather. Good sound machine made bricks were experimented on. The amount of oil and water taken up by the sandstone was very much less than that absorbed by the bricks, although the area of the sandstone cubes was much greater than that exposed by the bricks. Equal amounts of the raw and boiled oils were absorbed; the blue oil, however, was taken up in much greater quantity by both bricks and sandstone, but by the end of twelve months the whole of the 13½ ounces of blue oil had apparently evaporated away, and the brick had returned to its original weight, but those treated with raw and boiled oils remained unchanged. After the second oiling in November, 1890, and exposure for nearly four years and two months, they had practically retained all their oil, inasmuch as they had not lost weight and were also practically impervious to water. It was noticeable that the sandstone cubes treated with raw and boiled oils returned to their original weights, but do not appear to have lost the beneficial effects of the oils, being practically impervious to water.

A second paper by Professor Liversidge treated of the porosity of plasters and cements. An elaborate series of experiments was conducted to test the porosity of various plasters and cements. The trials were in all cases made upon slabs prepared by a skilled plasterer, 6 inches square by ½ inch thick, and finished off on one surface in the usual way for walls, the other surface being as left by the board on which the plaster was worked. The slabs consisted of No. 1, ordinary plaster; No. 2, Keene's cement; No. 3, a mixture of half Portland cement and half sand; No. 4, Portland cement. The Professor summed up his conclusions as follows:—From the experiments Keene's cement appears to be the best, on the whole, for indoor work; but it is not adapted for outdoor use unless painted, since it is to a certain extent soluble in water. It takes up less water, less organic matter, as represented by the glue, than others, and practically no dust. Further, it is

John Heath's Pens.

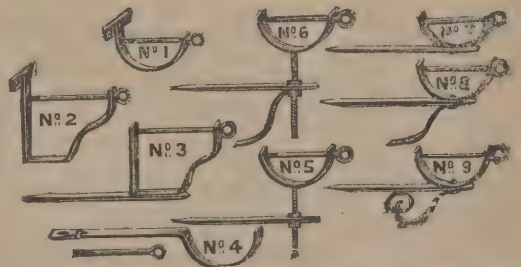
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PROOFS of this illustration, which appeared in "The Architect" on June 6, 1888 (now out of print), can be obtained on application to the Publisher, price Sixpence each, post free; on roller, Ninepence.

more resistant to the action of crystallising sodium sulphate; but Portland cement, if painted, would be even superior to it on account of its greater hardness and durability.

THE ALBERT HALL LAND.

THE board of management of the Royal Commission for the Exhibition of 1851 have caused the following letter to be addressed to the Official Receiver in companies' liquidation, with reference to portions of the Commissioners' estate formerly let to Mr. George Newman and Mr. Steel:—

18 Victoria Street, Westminster: March 21, 1895.

Sir,—I am directed by the board of management of Her Majesty's Commissioners for the Exhibition of 1851 to acknowledge the receipt of your letter of the 16th inst., in which, by direction of the judge, you forwarded for the information of the Commissioners copies of two statements made by Mr. Steel with reference to certain building agreements granted by the Commissioners in respect of land behind the Albert Hall and in Queen's Gate, and you intimated that the judge considers the circumstances under which the agreements were granted should be at once inquired into by the Commissioners.

The board desire, on the part of the Commissioners, to convey to the judge their thanks for the trouble he has taken in causing the papers to be forwarded to them.

The board of management had previously had their attention drawn to some remarks made by Lord Halsbury in delivering judgment in the Court of Appeal on the 14th instant on the hearing of an application made in the matter of George Newman & Company, Limited.

The board, after several preliminary meetings, held a special meeting on the 20th instant to investigate both the subjects referred to above. They have thoroughly examined the minutes and proceedings of the Commissioners and the correspondence which passed with the Commissioners and through their office. They have obtained from the solicitor and the surveyor of the Commissioners reports on the part which those gentlemen took in the transactions; they have had those gentlemen before them and have examined them. They have also examined their permanent officials.

The board are not themselves able to do more than this. They cannot summon before them the person who, according to the remarks of Lord Halsbury, has alleged or insinuated that, in order to obtain from the Commissioners what is called

the Albert Hall land, it was necessary to bribe different persons, nor the persons alleged to be connected with him, nor Mr. Steel, who in the papers forwarded by you refers to certain transactions with the surveyor and the solicitor of the Commissioners.

The suggestion, if any, contained in these statements of Mr. Steel seems to be that two parcels of land leased to Mr. Newman and Mr. Steel were given, "through private influence" exerted on the surveyor, on lower terms than the market value, and that they were then sold by them for large sums to other persons.

The Commissioners, having had very large experience in leasing land both to Government and to private individuals from the year 1857 to the present time, are satisfied that the plots of land leased to Mr. Newman and Mr. Steel were let at the proper market value in 1889.

Except a small piece of land sold by Mr. Steel to a Mr. Walker, under special circumstances, at an enhanced price of about 10 per cent.; and another piece sold by the Commissioners since resuming possession of it, at an enhanced price of 5 per cent., all the land has come back into the hands of the Commissioners by the failure of the conditions of the building agreements, and although tenders have been invited to let the land the Commissioners have as yet been unable to get the land leased on terms equal to those which they obtained from Mr. Newman and Mr. Steel.

So far as the board of management have been able to inquire into the circumstances they are satisfied that their officers had no knowledge of or participation whatever in the transactions which Mr. Sarl (the original applicant for the land), Mr. Newman and Mr. Steel appear to have had in selling their contracts for large sums, and they have passed a resolution to that effect, which I append.

But they hope the inquiry will not rest here, and they offer to give every assistance in their power to yourself or to the judge at whose instance you have written, not only by production of their minutes and records, but also by tendering the evidence of their officers, and if desired of the Commissioners themselves, to enable you to obtain the fullest information as to these transactions. The Commissioners will also be ready to be represented by counsel at this further inquiry should this be desired.—I am, sir, your obedient servant,

ARTHUR ELLIS, Major-General, Secretary.

To S. Wheeler, Esq., Department of the Official Receiver in Companies Liquidation, 33 Carey Street, Lincoln's Inn.

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Copy of Resolution of the Board of Management,
March 20, 1895.

It was moved by Lord Thring, seconded by Mr. Childers, and resolved as follows:—

"The board of management have had before them the letter from the Official Receiver and the judgment of Lord Halsbury relating to building agreements made by the Commissioners with George Newman and T. J. Steel, and have examined their paid officers in regard to the transactions as disclosed in the evidence before the Court of Appeal and in the depositions forwarded to the Commissioners by the Official Receiver.

"The board are thoroughly satisfied that their officers acted with perfect integrity and for the interests of the Royal Commission, and that they had no knowledge of, or connection direct or indirect with, the transactions for the sale of the original building contract of the Commissioners for the sum of 16,000*l.* or 26,000*l.*, referred to in the evidence."

GLASGOW INSTITUTE OF MEASURERS.

A MEETING of the council of the Institute was held on Monday afternoon, Mr. J. H. Ramsey, president, in the chair. The Secretary submitted communications from the Associations of Master Masons and Master Brickbuilders regarding schedules prepared by Mr. W. H. Dinsmore, a member of this Institute, for tenements in Kirk Street, Calton, proposed to be erected by the City Improvement Trust, and North Kelvinside School, for the School Board of Maryhill, complaining that these schedules had not been prepared in accordance with the "Glasgow Mode of Measurement for Masonwork, 1885," and the "Glasgow Mode of Measurement for Brickwork, 1894." The schedule for tenements, Kirk Street, having been examined, it was found that a serious departure from the standard mode of measurement had been made in its preparation, but a letter had been received from Mr. Dinsmore intimating his intention hereafter to measure his work in accordance with the modes authorised by this Institute and the other Associations concerned.

With regard to the schedule for the school at Kelvinside the council were gratified to learn from the Secretary of

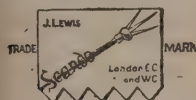
the Master Masons' Association that at a meeting of representatives of the Maryhill School Board and the Master Masons' Association with the architect and Mr. Dinsmore, the matters complained of had been adjusted in accordance with the standard modes of measurement. In view of the assurance given by Mr. Dinsmore in the letter referred to, the council deemed it unnecessary to take any further action in the matter.

NEW ASSEMBLY ROOMS FOR BIRMINGHAM.

It has often been said, says the *Birmingham Daily Post*, that although Birmingham is abundantly provided with public buildings which are an ornament to the city, it is very badly off for habitations of a reasonable size, which not only afford facilities for meetings and entertainments, but can be utilised with comfort and effect on the occasion of more festive gatherings of a public or private character. The Masonic Hall and the Exchange Rooms satisfy requirements to a certain extent, and the Edgbaston Assembly Rooms were erected to meet a more fashionable demand; but what is really necessary, in the opinion of most people, is a building in a central situation which will combine all the advantages to be found in the establishments mentioned. And it is in order to secure this desideratum that steps are being taken by Messrs. Henry & James Draysey to erect at the corner of Hurst Street and Inge Street a pile of buildings to be known as the City Assembly Rooms. Hurst Street is scarcely a locality in which one would look for a prominent public building, but it certainly possesses the merit of being central and easy of access from all parts of the city.

Plans of the new buildings have been prepared by Messrs. Essex, Nicol & Goodman, architects, Newhall Street, and from these it is evident that the City Assembly Rooms will contain the largest ballroom in Birmingham. The block is to have a frontage of 56 feet 6 inches to Hurst Street and 156 feet to Inge Street, and the total height will be 43 feet. The building itself will be of an ornate description, designed in the Spanish Renaissance style, and erected of red brick and buff terra-cotta. The principal entrance in Hurst Street, which is to be sheltered by a glass verandah overhanging the pavement, will be surmounted by an octagonal tower 100 feet high, and terminating with a lantern and Moresque dome. Facing the

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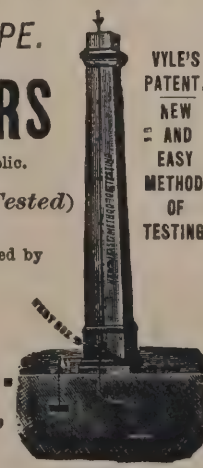
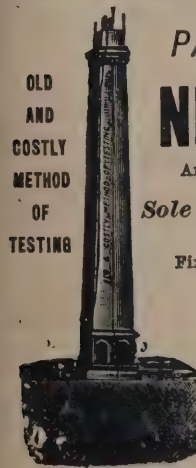
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street there are to be three lock-up shops with basement warehouses, the former being ornamented with terra-cotta arches. The elevation towards Inge Street is to be carried out in the same style, but of a plainer description, the height of the main building in the thoroughfare being 58 feet. The principal entrance in Hurst Street will lead into a vestibule, and then a large hall, 28 feet by 25 feet. From this apartment a staircase is to give access to the ballroom and drawing-rooms on the first floor. The spacious ballroom, with an ornamental open-timbered roof, is to be 75 feet long, 41 feet wide and 28 feet high. At one end will be a stage, with accommodation for theatrical and vocal artistes. There are to be two drawing-rooms, one running parallel with the ballroom and the other overlooking the street. The former apartment will be 41 feet by 24 feet, and the latter, lighted by terra-cotta windows, and separated from the ballroom by a promenade surrounding the staircase, is to be 54 feet by 25 feet. Under the ballroom on the ground floor, and exactly the same size in length and width, will be a room 16 feet high, which can be made available as a supper-room on the occasion of a ball, or it can be used for banquets, bazaars, public meetings, auctions, &c. By the side of this room, and consequently underneath the drawing-room, will be an apartment of smaller dimensions, affording adequate facilities for the holding of private or semi-public parties. In the rear of the supper-room the culinary department has been completely arranged. A second entrance is provided from Inge Street, and this will have the advantage of enabling the lessee to let the ground-floor rooms independently of the ballroom suite above. The cloak-room accommodation and the general accessories have been carefully supervised and the structural arrangements have been so contrived that two entertainments can proceed concurrently without interference with each other. According to the plans every attention has been paid to the all-important subject of the safety of the audiences. In addition to the ordinary staircases and entrances emergency exits have been provided in the principal rooms, a consideration which should inspire confidence in the management. One great feature of the scheme is the fact that the building will be capable of accommodating large or small parties. The whole of the rooms may be engaged, and 400 or 500 persons can comfortably be accommodated at a dance and supper, or if the party is a small one of say about one hundred persons, one of the drawing-rooms, which has a gallery for the musicians and ample space for a refreshment buffet, can be secured

as a ballroom. In any case, however, absolute privacy is insured, because the structure is so designed that the rooms engaged may be easily isolated from the other portions of the building. A fireproof floor is to be laid down over the lock-up shops and in the culinary department, and the whole of the premises will be heated and ventilated in the most approved manner; all the modern improvements will be adopted in the construction and fitting up of the assembly rooms. They will, moreover, be illuminated by electricity, and the arc lamp which it is proposed to place in the lantern will be a prominent feature of the tower. The internal decoration of the building will be in harmony with the architectural treatment of the exterior, and executed in Parian cement. The ballroom is to be made especially attractive, with its ornamental pilasters and proscenium front, the general scheme of colour being cream and gold. The total cost of the erection of the building and the furnishing and fitting of the rooms, &c., will amount to upwards of 11,000*l.* The contract for the building is to be placed in a day or two, and the work, which will be commenced forthwith, is expected to be completed in the autumn.

THE QUANTITIES QUESTION IN GLASGOW.

A MEETING of the Glasgow Town Council was held on March 22, when the subject of the schedules of quantities for labourers' dwellings which were rejected by the builders was introduced.

Mr. Nelson asked how many tenders were received for the brick and stonework of a block of labourers' dwellings in Kirk Street, Carlton.

Bailie Chisholm said one tender was received and passed by the committee. He understood from Mr. Bowers that another came in too late to be received.

Mr. Nelson said he understood that when tenders were sent out for this contract, the measurer departed from the usual course of measuring buildings, and went back to the old use and wont in existence in Glasgow three years ago. This was the first instance during the last three years in which the Improvement Trust had made any departure from the method adopted by architects, measurers and contractors in Glasgow. Seeing that there was only one tender, he thought it would be right for the sub-committee to take the subject back. He did not think the Corporation wanted to get 13 inches to the foot, nor



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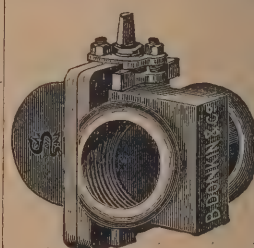
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that they should get only 11 inches to the foot. It would be unfair for the Corporation to seek to get a cheap job at the cost of a contractor. Before the measurements were adopted by the measurers, architects and contractors in Glasgow, almost every job of importance had to be sent to arbitrators. To avoid this, and in order that measurers and parties employing them, and contractors, might know exactly what was wanted, this scheme was adopted three years ago. He would be very sorry that the Corporation should depart from it without some good reason being assigned.

Mr. Donald Hamilton corroborated all Mr. Nelson's statements. The code of measurement had been adopted generally, and he did not see why the Corporation should depart from that which was so well recognised.

Mr. Robert Anderson said as one interested in contracting he had had a considerable deal to do with the formulating of the Glasgow code of measurement. Previously to its adoption every measurer was a law unto himself as to how he would measure and what he would exclude or include. It was to avoid this confusion that the code was drawn up. He thought that the committee or the engineer should be able to show very strong reasons before it was agreed to depart from the recognised practice. The fact that all the schedules for brick-building and masonry had been returned showed the sense of injustice under which the brick-builders and masons lay.

Mr. Steele said there was a difference of opinion as to the new code of measurement. There were quite a number of measurers who did not act under it. The reason why it was proposed to make an alteration was that the committee desired to see how far they could go in the direction of supplying dwellings for the working classes at a cheap rate.

A Member: At the expense of the contractors.

Mr. Steele: No.

The Member: At whose expense then?

Mr. Steele, continuing, said he thought it was beneath the dignity of the Building Exchange to make a noise against a small thing like that.

Mr. Robert Anderson stated that the code of measurement was in operation long before the Building Exchange came into operation.

Mr. Steele replied that he was quite aware of this. What he wanted to make plain was the fact that the code of measurement was not adopted by all the measurers. The mode of measurement adopted was stated at the top of each schedule, so that the officers knew the position of matters.

Mr. Robert Anderson said he was quite prepared to prove the fact. The committee were anxious to have the houses opened as soon as possible.

Mr. Battersby asked what difference the new method would make upon the rents of the proposed houses.

Mr. Shearer, apart from the dispute between the measurers and the Corporation, asked whether it was in the interest of the ratepayers that the Corporation should accept an offer without knowing whether it was in excess of what the amount ought to be. On that ground alone he thought it reasonable that the matter should be sent back for further consideration.

Mr. D. M. Stevenson held that when an offerer tendered in accordance with the conditions that had been laid down, and was in all respects a proper contractor, they ought to give him the preference if he was the cheapest. He did not think they should allow outsiders to alter their conditions after they had been laid down.

Mr. King asked if they were going to throw overboard a contractor who offered according to their conditions for the sake of others who might boycott them at any time.

Mr. Martin said that he had only learned that day that there was only one offer.

Mr. J. R. Paton urged that the minute should be taken back. He thought the Council sought to do everything honestly and honourably. If this work was done it must be paid for; and if the new mode was for the sake of getting it done cheaper, it must be at the expense of the contractors.

Mr. Campbell said that the Improvement Trust was taking upon itself to create a novelty, and to interfere with use and wont upon a very important matter affecting the interests of the community at large.

Mr. Willock said that had the representation come from an employees' association, instead of an employers' association, it would not have been considered.

Mr. Nelson said the saving that would be effected by the new method amounted to only 16*l.* 10*s.*

The Lord Provost said he understood that the schedules had been issued entirely on Mr. McDonald's responsibility, and not on the responsibility of any member of the committee.

Bailie Chisholm thanked the Lord Provost for making plain the position of the Improvement Trust Committee in this matter. The committee had not the remotest responsibility for it, and were in the utmost ignorance of the fact that Mr. McDonald had issued the specifications in the form he had done. Bailie Chisholm proceeded to explain that as a result



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of a conference between the health committee and the Improvement Trust, Mr. M'Donald was instructed to prepare plans for houses on a little piece of ground belonging to the Trust in Kirk Street, Carlton, and which they thought would be suitable for experimental tenements. Mr. M'Donald was instructed to produce the very best class of cheap houses, and with these instructions he thought on this method. Mr. M'Donald took the whole responsibility on himself. The conditions were plainly stated at the top of the specification. The one offer that had been received was less than the amount that Mr. M'Donald had anticipated, and it was therefore plain that they were not suffering because they had been boycotted by the other contractors. Mr. M'Donald was in London on official business, and was consequently not able to be present; but he had written a letter explaining the matter, and repudiating the statements that had been made by the Building Exchange committee. Bailie Chisholm concluded by stating that the matter involved was a very trivial experiment. If it succeeded they would be encouraged to do something on a larger scale. They would be able to compare the results of the old methods with those of the new, and do that which in their experience seemed best.

Mr. Campbell, in the light of the clear statement of the case by Bailie Chisholm, appealed to Mr. Nelson to withdraw his amendment. Personally he was quite satisfied.

Mr. Nelson declined to withdraw.

On a division the minutes were adopted by 49 to 11.

THE WEATHERING OF BUILDING STONE.

(Concluded from last week.)

THE action of oxygen as a weathering agent is important in respect to a few minerals only. Certain sulphides, especially the brassy yellow mineral iron pyrites, are changed by oxygen in the presence of moisture into sulphates and finally into oxides. Granites, marbles and other crystalline rocks containing these minerals may be weakened by their weathering out, and are stained an ugly brown by the hydrous oxide formed, so as to be quite disfigured. This change is less important in the sandstones, though even then the change of colours may be disagreeable. Many stones used in the Parliament Buildings at Ottawa illustrate this, the dark brown smear having some-time run down on to the blocks below. Stones rich in magnetite,

such as diabase, sometimes used as black granite, may be acted on in a different way. The mineral magnetite consists of the sesquioxide of iron combined with the monoxide. The latter portion may weather into hydrous sesquioxide, giving brown stains, and sometimes causing the rock to crumble. A similar effect, though less important, has been observed in some massive rocks containing large amounts of silicates rich in iron, hornblende or augite.

Water charged with carbonic acid is a very efficient weathering agent and has some action on most minerals, except quartz. In the granite of the Thousand Islands large blocks of quartzite are sometimes found, and as a rule the quartzite projects sharply an inch or so above the granite, showing the amount of weathering and degradation since the time some thousands of years ago when all was planed smooth by glaciers.

In the case of granite and other massive crystalline rocks this weathering consists in the change of the felspar into clayey substances and of the mica and hornblende into impure clay, oxides of iron, &c. The quartz grains are loosened in this way and are washed off by rain action, leaving fresh surfaces exposed. Without the help of frost it is probable that this variety of weathering would go on very slowly. Granite monuments in our cemeteries seem but little affected even after standing a number of years, though they gradually lose their polish and grow rough.

Limestones are more easily attacked. If pure they are slowly dissolved, but keep a tolerably smooth surface. If impure, as they generally are, the particles of sand and clay are insoluble and form a crust on the surface. With this the soot of city atmospheres combines to change the original colour into a dingy black. Limestones with large fossils soon become unsightly on dressed surfaces from the projection of the fossils. Marbles or crystalline limestones are very readily acted on. A study of marble tombstones in our cemeteries shows that even a few years' exposure removes the polish, except on parts that are protected. Every marble slab which I have examined, bearing a date of twenty years or more ago, has completely lost its polish on all exposed parts, has turned grey in colour and is so friable that one can easily rub off particles with the finger. It is quite evident that marble is entirely unsuited for outdoor use in the climate of Toronto.

Sandstones differ greatly among themselves in their liability to weather, hard quartzitic ones being almost unattacked, while porous, loose-textured sandstones crumble sometimes very rapidly. These differences depend chiefly on the character



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and amount of the cement which holds the particles together. A clayey cement is the worst, since it readily absorbs moisture and is crumbled by the action of frost. Such sandstones are seductively easy to work, so that builders are tempted to use them for carvings, but often the storms of a single winter will round the edges and spoil the sharpness of such carvings, particularly on exposed corners of buildings.

A calcareous or lime cement, though better than clay, is comparatively easily dissolved by rain water charged with carbonic acid, and still more easily by water containing traces of sulphurous or sulphuric acid, such as may frequently be found in the air of cities. Carbonate of iron is another, though rarer cement, which is easily soluble. The red anhydrous oxide of iron resists solution very well, the brown hydrous is less resistant. The most permanent cement of all is a silicious one, which is practically unaffected by rain charged with an ordinary solvent; but unluckily such sandstones are so hard to work, and usually of such poor colours, that builders rarely employ them.

A rather fine-grained grey sandstone frequently used in our cemeteries has turned darker grey, but resists weathering often admirably. Horizontal slabs fifty years old are not at all friable and still retain their inscriptions, though somewhat encrusted with dirt and lichens. A yellowish sandstone has not stood as well, and after thirty-five years in one instance has weathered so as to be quite illegible.

The presence of clay spots in sandstone is most injurious to the appearance, since they weather out and leave ugly holes, sometimes not standing even a single winter. The filling of the holes with powdered sandstone and shellac renders the stone presentable, but only for a short time. Still worse is the presence of clayey layers between the laminae either of sandstone or limestone. The clay rapidly weathers out, spoiling the dressed face of the stone and in time weakening the whole wall.

The hardening of certain limestones and sandstones after quarrying is an interesting effect of the action of the air, though not properly included under weathering. It appears to be due to the drying-out of the quarry water with which the stone was soaked. As it dries out, all the substances which it held in solution, such as lime and silica, are deposited, hardening the surface of the block. If once this hardened skin is removed, however, no amount of wetting with pure water will renew it.

Thus far we have considered the action of the weather in decomposing and dissolving part or all of the constituents of a

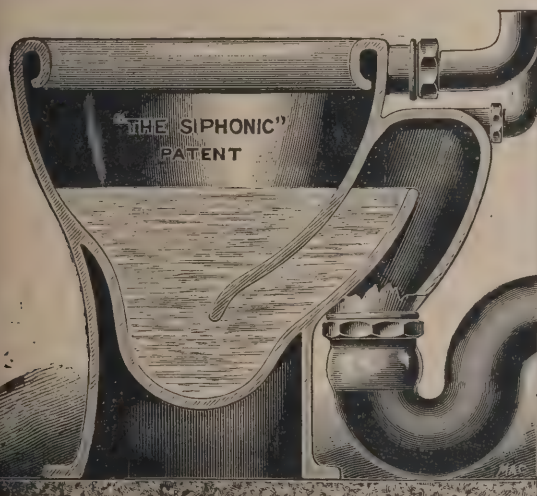
building stone, injuring its strength and durability; but there is another action of some importance to the architect as an artist, that is, the slow change of colour which most varieties of stone undergo after taking their place in a building. This may be called the mellowing touch of time as contrasted with his gnawing tooth, and from the artistic side an architect's work, like a rich wine, may ripen and improve with years.

Most of these colour changes are the result of slow oxidation. Some dark grey or bluish limestones, like those of Kingston, contain bituminous matter from the multitude of fossil organisms that died to form these beds of rock. This colour is slowly lost by oxidation, and the surface of the stone gradually reaches the true colour of the limestone, a pale grey, sometimes even suggesting marble. As a general rule such changes of colour are due to oxidation of iron compounds from the monoxide, which is green or black as a rule, to the sesquioxide, which is yellow or brown or red. The general effect then is to change the colour from cool greenish greys to warmer yellows or browns. An old marble statue, cold white in the beginning, becomes yellowed like old ivory with the lapse of time; but this change may be due partly to the action of dust and soot in cities. Many whitish or grey limestones yellow in a somewhat similar way. Grey or greenish sandstones generally take on a yellow or brown tone in time. In many cases this change of colour is a distinct improvement, especially where stones of different colours which do not quite harmonise have been used together.

Of course in cities burning much soft coal, colour is of no importance, since all colours are presently shrouded in an impartial pall of sooty grey or dingy black.

In towns burning mostly hard coal, like our own Toronto, with its usually clear skies and clean atmosphere, the colour scheme and the changes which time will give rise to should be carefully considered, more so than they are at present.

In choosing a building stone which has not been thoroughly tested by use one may very easily make mistakes. The colour, the texture, the power to resist crushing strain, as the stone comes from the quarry, may all be greatly modified by weathering. The amount of moisture which the stone will absorb, the chemical constitution and the mineral composition, as shown under the microscope, all afford data by which to judge of its lasting qualities; but perhaps the best test of all is to examine the neighbourhood of the quarry and see what effect weathering has had upon loose blocks or exposed ledges of similar stone. In any case, architects in choosing stone for



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LIGHTHOUSE ILLUMINANTS.

A MEETING of the Shipmasters' Society was held on the 19th inst. at the London Chamber of Commerce, when a paper was read by Mr. John R. Wigham on "Lighthouse Illuminants." He alluded to the origin of the use of gas for lighthouses, remarking that it was first employed at the Bailey Lighthouse, near Dublin, in 1865. Up to that time there were no means by which a lighthouse-keeper could increase the power of his light in thick weather. It occurred to him (Mr. Wigham) that such a plan would be of much value to mariners, and the burner which he constructed was used in all the lighthouses in which his gas system was adopted. The burner had six powers, which might be added according to the state of the weather. A light-keeper could thus almost instantaneously increase his light in thick weather, and when the necessity had passed again reduce his light to its ordinary power. Mineral oil was the illuminant now used in most lighthouses. Following the example of the gas-burner, the larger sizes of the oil lamps were provided with a means by which the light in thick weather could be increased. The lecturer afterwards referred to the electric light, which, he said, he had not found useful in penetrating fogs, and he quoted the testimony of mariners to this effect. He exhibited a model of what he called the "giant lens," which was made by Barbier & Co., of Paris, and which he described as by far the most important advance that had been made in lighthouse lerticular apparatus since the time of Fresnel. The most recent improvement which he had suggested in lighthouse illumination was what he had called the "continuous pulsating light," by which, he said, all the power of the lenses of revolving dioptric apparatus could be secured to the mariner continuously. At present the light from such apparatus was intermittent, but under the new arrangement the light would be permanent, and would also present a peculiar pulsating appearance, which could not possibly be mistaken for any other light. In addition to all the present known appliances for strengthening the power of lighthouse illuminants in foggy weather, he advocated the placing outside on the balcony of every lighthouse and lightship of flaring apparatus of the photogene type, so as to illuminate the fog, and thus

enable mariners to see the effect of the light when they could not see the direct beam of the lighthouse. In the discussion which followed Admiral Colomb alluded to certain experiments which he had made some years ago to determine what effect the size of the light had with regard to its intensity. These experiments were, however, very incomplete; but the new gas—acetylene—promised a great field for use in lighthouses in the system described by the lecturer.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 5161. Edwin Verity and Benjamin Banks, for "Improvements in Sliding Ventilators."
- 5171. Thomas William Twyford, for "Improvements in or additions to water-closets or water-closet basins."
- 5274. Samuel Stevens Hellyer, for "Improvements in and connected with lavatory basins and the like."
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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

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There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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NOTICE.

Next Friday being Good Friday, THE ARCHITECT will be published on Thursday. All Advertisements intended for this Number must reach the Office not later than 3 p.m. on Wednesday, April 10.

TENDERS, ETC.

* * As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

COMPETITIONS OPEN.

ABERGAVERNNEY.—April 11.—The Managers of the Abergavenny Intermediate School for Girls invite Designs for School to accommodate 60 Girls. Mr. F. Baker Gabb, Clerk, Abergavenny.

BRIGG.—April 19.—Designs are invited for Scheme for Sewerage and Sewage Disposal. Mr. G. S. Sowter, Urban District Council Offices, Brigg, Lincolnshire.

KIRKCALDY.—May 1.—Plans are invited for proposed Infectious Diseases Hospital. Town Clerk, Kirkcaldy.

LLANELLY.—May 15.—Elevations and Plans are invited for proposed School. Mr. Fred. Nelson Powell, Clerk to the Managers of the Llanelly Intermediate and Technical Schools, Llanelly.

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ABERDEEN.—April 9.—For Building Dwelling-house and Offices. Messrs. Jenkins & Marr, Architects, 16 Bridge Street, Aberdeen.

ABERTILLERY.—April 15.—For Building Schools. Mr. Geo. Rosser, Architect, Victoria Buildings, Abercarn.

ACCRINGTON.—April 9.—For Constructing Gasholder Tank. Mr. A. H. Aitken, Gas Board Offices, St. James's Street, Accrington.

BARNSELY.—April 11.—For Building Sixteen Houses. Messrs. Wade & Turner, Architects, 10 Pitt Street, Barnsley.

BELFAST.—April 11.—For Constructing Main Conduit. Mr. Richard Hamilton, Waterworks Office, Royal Avenue, Belfast.

BELPER.—April 20.—For Alterations and Additions to Lock-up. Mr. J. S. Storey, County Surveyor, Market Place, Derby.

BRADFORD.—April 10.—For Enlarging Chapel. Messrs. Walker & Collinson, Architects, 227 Swan Arcade, Bradford.

BRAINTREE.—April 18.—For Erection of Casual Wards, Board and Committee Rooms, &c. Mr. Frank Whitmore, Chelmsford.

BRAMHOPE.—For Building Church and Schools. Mr. W. S. Morley, Architect, 269 Swan Arcade, Bradford.

BRISTOL.—April 6.—For Laying Cast-iron Socket Pipes. Messrs. T. & C. Hawksley, 30 Great George Street, Westminster.

BUILTH.—April 24.—For Constructing Reservoir, Filter-bed, &c. Mr. K. L. Bamford, Widemarsh Street, Hereford.

CARDIFF.—April 5.—For the Reconstruction of Gaslight Company's Offices and Showrooms. Mr. Henry Morley, Gas Offices, Bute Terrace, Cardiff.

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CARLISLE.—April 10.—For Constructing Brick Tank. Mr. J. Hepworth, Gas and Water Offices, Carlisle.

CARLISLE.—April 10.—For Building Gymnasium. Mr. Geo. Dale Oliver, Architect, Carlisle.

CAVERSHAM.—April 19.—For Constructing Drainage Works. Mr. N. Lailey, 16 Great George Street, Westminster.

CITY OF LONDON.—April 9.—For Paving with Australian Hard Wood a Portion of the Carriageway of Upper Thames Street. Mr. H. Montague Bates, Sewers Office, Guildhall, E.C.

DARENTH.—April 17.—For the Erection of a Board School for 220 Children, with Boundary Wall or Fence. Mr. W. J. Judge, Horn's Cross Stone, Greenhithe, Kent.

DENTON.—April 8.—For Building House and Chapel. Mr. C. H. Newton, District Council Office, Denton, Lancs.

DEPTFORD.—For Trial Boring for Water. Mr. Thomas Dinwiddy, Architect, Greenwich, S.E.

DINGWALL.—April 22.—For Repairing Roads. Mr. A. G. Joass, Surveyor, Dingwall, N.B.

DUBLIN.—April 15.—For Building Railway-station Offices, Waiting-rooms, &c. Mr. W. H. Mills, Amiens Street Terminus, Dublin.

ECCLES.—April 11.—For Building Brick Panel Wall. Mr. A. C. Turley, Borough Surveyor, Eccles, Lancs.

EDMONTON.—April 9.—For the Supply and Delivering of 50,000 Blue Bricks. Mr. G. Eedes Eachus, Town Hall, Lower Edmonton.

EGHAM.—April 10.—For Building Technical Institute. Mr. W. Menzies, Englefield Green, Surrey.

FULHAM.—April 10.—For Making-up and Paving Shotten-dane Road. Mr. Chas. Botterill, Town Hall, Walham Green.

GOSFORTH.—April 23.—For Extending Asylum. Mr. John W. Dyson, Architect, 18 Grainger Street, Newcastle-on-Tyne.

GREAT YARMOUTH.—April 10.—For Building Engine-house and Latrines. Mr. J. W. Cockrill, Town Hall, Great Yarmouth.

GREAT YARMOUTH.—April 12.—For Building Water Tower. Mr. D. Palmer, 38 Hall Quay, Great Yarmouth.

HEATON NORRIS.—For Building Thirty-six Houses. Mr. C. Greenhalgh, Reddish, near Stockport.

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HORSHAM.—April 10.—For Supplying Socket Pipes, &c. Mr. W. H. Sadler, Clerk to the Urban District Council, Horsham.

INCHBROOK.—April 8.—For Building Infants' School. Mr. M. H. Medland, Architect, Gloucester.

KETTERING.—April 22.—For Constructing Service Reservoir. Mr. T. Hennell, 6 Delahay Street, Westminster.

LEEDS.—April 13.—For Supplying and Erecting Six Purifiers. Mr. R. Smith, New Wortley Gasworks, Leeds.

LITTLE LOCH CRAIGNISH.—April 16.—For Constructing Pier. Mr. G. Woulfe Brenan, Engineer, Oban.

LONDON.—April 11.—For Construction of Pipe Sewers in the Lowther Arcade and Bull Inn Court, Strand. Mr. Chas. Mason, C.E., Town Hall, Charing Cross, S.W.

LONDON.—April 17.—For Supplying Aberdeen Granite Cubes. Mr. W. H. Atkins, Board of Works Office, Bank-side, S.E.

LONDON.—April 23.—For Erection of a Timber Shelter in Clissold Park and Two in North Woolwich Gardens. Mr. H. De la Hooke, London County Council, Spring Gardens.

LURGAN.—April 18.—For Building Business Premises. Mr. Henry Hobart, Architect, Dromore, Co. Down.

MACCLESFIELD.—April 6.—For Rebuilding Mills. Engineer, Gasworks, Macclesfield.

MANCHESTER.—April 15.—For the Supply of 500 Tons of Bessemer Steel Tram Rails, Fishplates, &c. Mr. William Henry Talbot, Town Hall, Manchester.

MANCHESTER.—April 18.—For Alterations and Additions to Horse Hospital. The Engineer, Manchester, Sheffield and Lincolnshire Railway Company, London Road Station, Manchester.

MANCHESTER.—For Supplying Granite Setts. Chief Clerk, Highways Office, Town Hall, Manchester.

MARTHOLME.—April 6.—For Building Boundary Wall. Messrs. Brierley & Holt, 10 Richmond Terrace, Blackburn.

MELTON.—April 6.—For Providing and Sinking Two Cast-iron Cylinders at Asylum Waterworks. Messrs. George &

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MIRFIELD.—April 19.—For Building Two Detached Houses and Eight Cottages. Mr. Reuben Castle, Architect, Westgate, Cleckheaton.

MORLEY.—April 13.—For Building School. Messrs. Holtom & Fox, Architects, Dewsbury.

MORLEY.—April 13.—For Pulling-down and Rebuilding Three Houses and Shops. Mr. T. A. Buttery, Architect, Queen Street, Morley, Yorks.

NAVIGATION.—April 6.—For Building Two Houses. Mr. W. Davies, 1 West Street, Navigation, Wales.

NEWCASTLE-ON-TYNE.—April 23.—For the Erection of the Superstructure of the Extension of the City Asylum. Mr. John W. Dyson, 18 Granger Street, Newcastle-on-Tyne.

PENISTONE.—April 10.—For Additions to Infirmary. Mr. G. A. Wilde, Architect, Bank Street, Sheffield.

PENRITH.—April 15.—For Constructing Waterworks. Mr. C. N. Arnison, Rural District Council Offices, St. Andrew's Place, Penrith.

PORTSMOUTH.—April 17.—For Making Roads. Mr. A. Hellard, Town Hall, Portsmouth.

READING.—April 6.—For Repairing Bridges. Mr. Joseph Morris, 156 Friar Street, Reading.

ROCHESTER.—April 17.—For Making-up Roads. Mr. William Banks, Guildhall, Rochester.

RUABON.—April 12.—For Building Court-house. Mr. R. Lloyd Williams, County Surveyor, Denbigh.

SENGHEUTH.—April 13.—For Building Hotel. Mr. E. H. Burton, Architect, 15 Queen Street, Cardiff.

SOUTHGATE.—April 19.—For the Supply and Delivery of 1,500 Tons (more or less) of Hand-broken Granite, the carting thereof from the railway stations to various points in the district, Glazed Fireclay Pipes, Pipes with Special Watertight Joints, Portland Cement, Iron Castings, &c. Mr. W. M. Ellenor, Council Offices, Palmer's Green, N.

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STEEPLE CLAYDON.—April 23.—For Building Schools, &c. Messrs. George Bennett & Sons, Surveyors, Buckingham.

ST. LUKE'S.—April 10.—For Construction of a Sewer and Laying-out and Paving and Kerbing a New Street and Laying of Tar-paving in Recreation Ground. Mr. G. Whitehead Preston, Vestry Clerk, Vestry Hall, City Road, E.C.

STOCKPORT.—April 22.—For Constructing Brick Sewers, Cast-iron Culverts, &c. Mr. A. M. Fowler, 1 St. Peter's Square, Manchester.

THORNHILL.—April 16.—For Constructing Pipe Sewer. Mr. James C. Haller, Council Offices, Thornhill, Yorks.

TORQUAY.—April 8.—For Building Retort-house. Mr. R. Beynon, Engineer to the Gas Company, Vaughan Parade, Torquay.

TREDEGAR.—April 6.—For Alterations and Additions to Schools. Mr. C. Dauncey, School Board Offices, Castle Street, Tredegar, Mon.

UXBRIDGE.—April 8.—For Repairing and Decorating Cemetery Chapel & Lodge. Mr. Henry Bird, 1 Vine Street, Uxbridge.

WARRINGTON.—April 15.—For Supplying Granite Cubes, Chequered Tiles and Blue Bricks. Mr. T. Longdin, Town Hall, Warrington.

WHITTINGHAM.—April 11.—For Repairing Heating Apparatus, &c., County Asylum, Whittingham, Preston.

WIGAN.—For Building School, Shops, &c. Messrs. Heaton & Ralph, Architects, Wigan.

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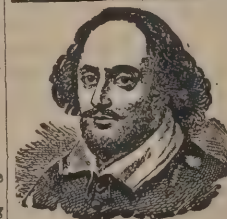
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H. B. Wilson, Canterbury	1,212	0	0
W. J. Adcock, Dover	1,170	0	0
L. Seager, Sittingbourne	1,137	0	0
R. Knock, Ashford	1,134	0	0
J. J. Hall, Dover	1,049	10	0
A. J. Brewster, Canterbury	1,049	0	0
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Paramor, Margate	1,250	0	0
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H. B. Wilson, Canterbury	1,212	0	0
W. J. Adcock, Dover	1,179	0	0
L. Seager, Sittingbourne	1,137	0	0
Knock, Ashford	1,134	0	0
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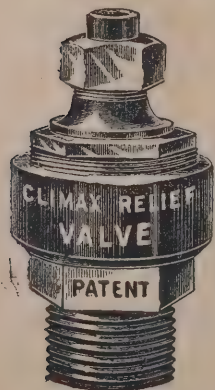
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W. J. Robertson	£487	16	6
J. L. Millar	438	2	8
Brown & Co.	459	10	0
G. Wright	484	14	3
Cowper & Henderson	420	10	1
Draper & Sons	404	17	6
Crawford & Son	403	8	3
J. C. Robson	393	9	5
T. Lumsden	375	0	0

HUCKNALL TORKARD.

For Laying Sewers and Making and Forming Streets (including Materials), for the Hucknall Torkard Urban District Council. Mr. WM. SWANN, Surveyor.			
J. Bradley	£1,001	6	0
J. Holme	830	0	0
J. & R. STAINFORTH, Beardall Street, Hucknall Torkard (accepted)	740	0	0
Tomlinson	739	0	0

KING'S LYNN.

For New Steam Laundry, Stables, &c., at Gaywood, King's Lynn, for Messrs. G. G. Barrett & Co. Mr. JOHN R. FAYERS, Surveyor, Market Place, King's Lynn			
Bead & Wildbur	£1,079	7	0
R. W. Fayers	1,002	4	0
W. H. Brown	990	0	0
COLLINS & BARBER, Downham Market (accepted)	892	0	0

LEWISHAM.

For Factory Gates and Alterations at Silk Mills, for Messrs. Stanton. Mr. T. DINWIDDY, Architect.			
WOOD (accepted)	£450	0	0

LIVERPOOL.

For Erection of Central Fire Station and Police Buildings in Hatton Garden			
PATTERSON & SON (accepted)	£30,770	0	0
For Construction of Covered Service Reservoir at Breeze Hill.			
HOLME & KING (accepted)	£16,661	7	7

MOUNTAIN ASH.

For Levelling and Channelling Dover Street, Mountain Ash, for the Urban District Council.			
Willans Bros.	£133	8	0
E. Davies	122	5	11
J. JOHNS, Mountain Ash (accepted)	105	8	11
Barnes, Chaplin & Co.	102	3	7

NANTWICH.

For Erection of Laundry and Boiler-house at Workhouse. Mr. J. A. DAVENPORT, Architect.			
D. Johnson, Crewe	£1,710	0	0
Samuel Manley, Aston	1,625	0	0
A. & J. Hulse, Winsford	1,560	0	0
John Harding, Nantwich	1,445	0	0
John Matthews, Nantwich	1,433	0	0
THOS. GRESTY, Willaston	1,430	0	0

NOTTINGHAM.

For Building Store, Warehouse, Offices and Stabling, Canal Street, Nottingham, for Messrs. Fellows, Morton & Clayton, Limited. Mr. W. DYMCK PRATT, Architect, Long Row, Nottingham.			
T. T. Wilcock	£6,117	6	0
T. Fish & Sons	6,056	0	0
E. Hind	5,707	0	0
J. Dickinson	5,598	0	0
J. W. Woodsend	5,550	0	0
A. B. Clarke	5,456	0	0
J. Oscroft	5,300	0	0
J. Wheatley	5,224	0	0
E. Wood	5,212	1	2
F. Messom	5,120	0	0
F. Evans	5,094	0	0
Dennett & Williamson	5,025	0	0
GILBERT & GABBITASS, Nottingham (accepted)	4,992	0	0

ONGAR.

For Alterations and Additions to the Workhouse.			
H. Farrow, Chelmsford	£152	10	0
F. Noble, Ongar	148	7	1
H. BARLOW, Ongar (accepted)	143	1	6

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112 lbs. per bushel. Slow setting; test 1,000 lbs. to 1 1/2 inch; seven days. Fineness, 2,500 meshes to square inch, with less than 10 per cent. residuum. Over 10,000 tons supplied to Cardiff and Hereford Water Works.

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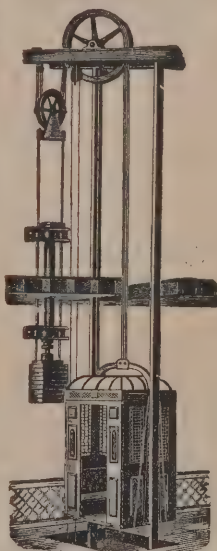
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REDRUTH.

For Alterations and Additions to Schools, for the Redruth School Board. Mr. SAMPSON HILL, Architect.

Trewirgie.

HODGE & HEAD, Redruth (accepted) . . . £576 10 0

East End.

A. NICHOLLS & SON, Redruth (accepted) . . . 225 0 0

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MOYLE & MITCHELL, Chacewater (accepted) . . . 416 17 0

WALMER.

For Alterations to the Union Club. Mr. T. DINWIDDY, Architect.

Denne & Son . . . £165 10 0

Wise . . . 160 0 0

COTTEW (accepted) . . . 155 10 0

THE BUILDING EXHIBITION.

IN this number we resume our notices of the principal stalls in the Building Exhibition, which amply represent the industries connected with construction in this country.

The National Accident-Prevention Safety-Window Company showed the National Accident-Prevention safety-windows, which deservedly took a gold medal at the Manchester exhibition of 1894. This system of safety-windows seems the perfection of simplicity, owing to the absence of any more mechanical arrangements than are found in ordinary windows that slide up and down. But for safety purposes while cleaning they open inwards; a metal rod or stay is then applied, keeping the sash at a convenient angle, and removed as soon as the cleaning is effected. One rod will serve for every window and sash in the house, and may then be relegated to the housemaid's sanctum for brooms and other treasures used for carrying out the service of the house. It is a simple process to apply this system to any existing windows. The adoption of this system is now very universal, and it is stated that in one month 10,000 were adopted. The matter of convenience is very important, but what is most important is that safety is secured for the cleaners of windows.

William Hayward & Sons.

This exhibit was in its special department second to none. This firm are manufacturers of wrought-iron entrance gates, palisading, grilles, &c. The designer of the work shown is to

be congratulated on his very ornamental treatment of wrought-iron. Ornamental ironwork is not successful in many cases, because the element of success depends on simplicity, which is not easily achieved. Any amount of elaboration will not give artistic effect to ironwork, such as was seen in the samples shown by William Hayward & Sons at their stand in the Hall. To be elaborate in ornament is comparatively easy to the majority. To gain the highest artistic effects by simplicity is not at all easy, and only a minority succeed. The articles shown included beautifully designed and executed entrance-gates, double or central gates, single gates, grilles for doorways, &c. The effect of the palisading was well shown as fixed on sections of dwarf walling in brickwork and stone coping. These specialties above referred to include several new designs, shown, we believe, for the first time. There are different styles of architecture, and Messrs. Hayward & Sons' designs differ in style accordingly, so as to show what is in harmony with any particular design.

Walter Gibbs.

Mr. Walter Gibbs had a grand assortment of glass decoration. His patent process of amber-staining is claimed to be the best and latest improvement in glass-work, and that it has brought the art of French embossing and brilliant cutting to its highest perfection. It is a harmonious combination of white and gold decoration designed and developed to be principally adaptable for hotels, public buildings, mansions and domestic purposes generally, with equal effect. He had also some beautiful specimens of handpainted mirrors painted on the back of glass, which give them a most brilliant effect; also some specimens of engraved mirrors. His other exhibits consisted of samples of writing for brewers' tablets, fascias, &c., embossed, shaded embossing (double and treble), plain and ornamental lead-glazing in variety. The work seen at this stand was worthy of being shown at any exhibition.

Freeman Bros.

Freeman Bros., of York Road, Battersea, showed samples of their now well-known "grip-joint" lead connections for joining closet-traps and other earthenware nozzles to lead soil and other pipes. These joints have already been subjected to three years' practical tests, and are found to be most thoroughly reliable. By the use, in conjunction with them, of the screwed earthenware nipple which the firm supply at a very nominal price, any pedestal or other closet that is in stock can be used with the "grip-joints." They also showed their patent adjust-

BRICK RUBBISH, EXCAVATION MATERIAL,
SPENT LIME, ROAD SWEEPINGS, &c., &c.

FLOWER & EVERETT,

69 KING WILLIAM STREET, E.C.

At the NEAREST SHOOT to London Bridge.

BARGES PLACED ALONGSIDE ON SHORT NOTICE FOR LOADING
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Owners' Barges brought to the Shoot will be unloaded with
prompt despatch on low terms.

CONTRACTORS FOR EVERY KIND OF DREDGING BY STEAM AND HAND.

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Estimates submitted for Complete Installations. Large Staff of Competent Workmen under experienced supervision

GASFITTERS AND HOT-WATER ENGINEERS.

ESTIMATES GIVEN FOR EVERY DESCRIPTION OF GAS LIGHTING AND HOT-WATER APPLIANCES.

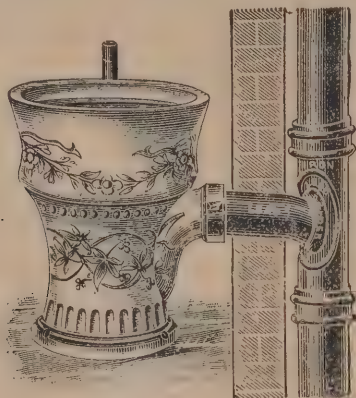
ELECTRIC BELL AND SPEAKING-TUBE FITTERS.

Gasfitting Manufacturers, Chandeliers, Brackets, Hall Lights, &c.

SHOWROOMS AND MANUFACTORY:—

55 and 56 HIGH HOLBORN, LONDON.

able pedestal closets, which, though made on the latest approved lines sectionally, are also so designed as to be adaptable for use under the very frequent awkward conditions that pertain to closet-fixing; for instance, in event of the position of the outside soil pipe making it desirable that the outgo from closet-trap should be even at right angles relatively to the basin inlet, compliance with this stringent and most usual requirement is perfectly possible by using this closet; and consequently, even though but one of the type is kept in stock, the plumber is ready for any exigency as to fitness for position. Their latest sanitary specialty, viz lead-lined cast-iron junction-pieces, to afford facilities for making connections between lead branch soil pipes, sink wastes, anti-siphon pipes, and the like, and cast-iron outer pipes, in a mechanical and thoroughly workmanlike manner,



will further be found a most economical arrangement, in comparison to the use of brass ferrules, thimbles, &c. A combination of these specialties was well represented by the firm's "Triple Alliance," a block of which we display with this notice. Altogether the exhibit had much to commend it, and our readers will do well to write for price list.

Also were shown, for Messrs. William Hepton & Son, of Hunslet Lane, Leeds, their special registered corrugated copper cylinders for domestic hot-water purposes, which are constructed with a view to securing cheapness with efficiency. It is well known in the trade that the system of loading cylinders only reduces the price per lb., but the cost of such a cylinder is greater

than that charged for corrugated cylinders, which are sold at so much each and guaranteed to stand a definite pressure; by specifying you save money and secure a pure cylinder to stand pressure required. The cylinders are well finished, with bright polished tops, and fitted with cap and lining unions, with iron thread, which greatly facilitate fixing. This firm also exhibit some seamless corrugated copper cylinders, which are exceedingly well made, the bodies being one piece of copper without any join, and from appearance should command a ready sale. Their London representative, Mr. W. E. Morris, informs us that these cylinders are gradually finding favour with the trade, and that the prices compare favourably with galvanised iron cylinders, costing but a trifle more; but copper cylinders have several points in their favour, principally, that they hold the heat much better, do not discolour the water, last from fifteen to twenty years, and are of value when taken out.

Potter & Co., Limited.

Messrs. Potter & Co., Limited, of Victoria Street, showed their fireproof floor construction, a combination of steel and concrete lintels and beams. The "A" floor, a section of which was shown, weighed 24 lbs. per foot super, and is up to loading with 450 lbs. super per foot without injury. Floor "B," a section of which was also shown, was similar, with the exception that it is without ceiling. Their "C" floor, which can be executed as quickly as wood floor, also being quite dry, is ready for immediate use, and the ceiling affords considerable scope for artistic treatment, and the weight is only 16 lbs. per foot super. Floor "D" is of the lightest possible description for a fire-resisting floor, is similar to floor "C," but the ceiling is omitted, and it is not sound-proof. The weight is 13 lbs. per foot super, but the floor-slabs have stood a test up to 10 cwt. per foot super. A feature of this system is that it is very inexpensive.

Candy & Co., Limited,

of South Devon (London office, Queen Victoria Street), showed a fine collection in various specimens of sanitary stone-ware, white and coloured glazed bricks, salt glazed bricks, facing and engineering bricks, architectural terra-cotta, granite vitrified paving bricks, &c., a feature of their productions being that they are acid-proof, in addition to the numerous other merits.

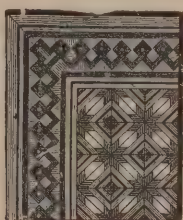
Moule's Patent Earth Closet Company, Limited.

This company showed their system, which is used in so many districts all over the country. The sanitary principle which

PARQUET FLOORINGS

One inch and $\frac{1}{2}$ -inch thick.

Immense Stock always ready for Laying.



Turpin's Patent 5-16 inch thick.
Laid in Patent Composition on Concrete, Stone, and Deal Floors. (See section.)



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MARBLE MOSAIC PAVEMENTS

Executed in all Styles.

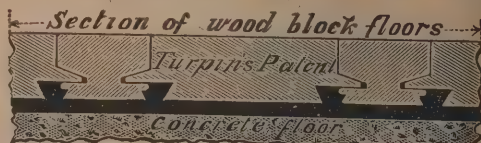
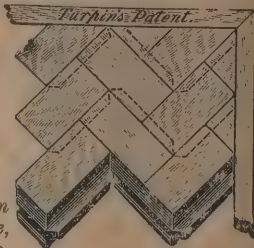
OAK BLOCK FLOORINGS

One inch thick, from 4/10 $\frac{1}{2}$ per yard super.

Also in Pitch Pine, Teak, Deal, &c.

JOINERY.

TURPIN'S PATENT INTER-LOCKING SYSTEM for Laying Block Floors on Concrete, Stone, and Deal Floors.



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Cast-iron Columns, Stanchions, Girders, Window Sashes, Sewer Ironwork, Railway Plant, Ornamental Columns and Brackets for Railway Stations, Cast-iron Tanks, and every description of Castings for the use of Engineers, Builders and Contractors. Estimates gladly furnished on application.

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Telegrams, "IRON, WELLINGBORO."

characterises the Moule's closet is the same, but a great variety was shown in the mode of application to so numerous requirements. To mention a few, ranges of closets for schools, workhouses and the like were provided and the models shown. There were portable closets according to different needs, and they were also shown fitted up in high-class style for the use of cottages, farms, &c.

The Sanitary Bath Company, Limited,

of 12 Miller Street, Camden Town, showed in some five or six baths handsome examples of well-finished work in their patent steel-clad copper and patent enamelled steel baths and fittings, which are already known in the market.

H. & A. Hooydonk

showed samples of the beautiful decorations in Hooydonk's patent Dakoria as applied for mantelpieces, wall-panels, dados, friezes, pilasters, &c. At night the stand was illuminated by electric light furnished by Mr. F. Hooydonk, electrical engineer.

The Fireproof Construction Co.

Most excellent samples were shown as demonstrations of the value of this company's hygienic fireproof partitions, specimens being on view showing its principle. The hygienic fireproof cement is, in addition, a cement to be recommended. There are many advantages in the hygienic construction, some of them being the following:—The partitions are in themselves less than one-fifth the weight of $4\frac{1}{2}$ brickwork, but the interlacing binding procured by their system of clamping renders them perfectly self-supporting from wall to wall, so that if necessary any portion of the wall may be cut out, which is done simply by sawing, for doorways, &c., without in the least degree weakening the partition. This property also avoids the necessity of using an iron joist to carry the wall, as the work can be built straight on to the wood floor. The absence of any woodwork in this structure should be a recommendation for its adoption, as the inconvenience of cracked walls and dry rot are thus entirely obviated, as also the open space which in a lath-and-plaster partitioning makes such a grand receptacle for vermin and dirt. The partitions are also sound-resisting, and have been used in musical cubicles to stop the noise of piano practice with great success. The same methods of construction as are applicable to the walls of buildings are also used for the fireproofing of wooden joist floors.

Joseph Kaye & Sons, Limited,

were well represented at their stand by their ingenious and useful appliances, which we have so often referred to. Mr. Kaye has distinguished himself in invention, and had a good exhibit of his locks and bolts. Kaye's patent automatic wedge-lock for broughams, as adopted by Lord Suffolk for H.R.H. the Prince of Wales's broughams, and highly approved of, was shown. This lock wedges the door fast by easy closing, and so saves banging the doors to. The handles plainly indicate the door fast or not fast, which is of importance. Kaye's patent automatic wedge-lock is adopted in other forms by railway companies for all kinds of doors on carriages to prevent rattling, and with the patent automatic safety catch it is the greatest safety, with inside handles, and will be a great saving of carriage doors, and require no attention of guards or porters. It will be greatly to the advantage of all railway companies and the travelling public to adopt them on all kinds of carriage doors, as no one can get out of a train only purposely. They also have made above 25,000 of another lock for the Great Northern Railway, besides other railways, which has great security and lasting qualities, some of which have been in use nine years and are still perfect.

John F. Simmance,

of Hatton Garden and St. John Street Road, E.C., showed his patent exit valve system of ventilation, as adopted on the White Star line of steamers, H.M. torpedo-boats, &c., adapted for drain (foot) ventilation, and other purposes, insuring the proper direction of currents of air. It is well contrived for the purpose, to be as independent of currents of air and draughts as any system can be. Since its first introduction it seems to have further improved and simplified, with the result that prices are quoted at very cheap rates, and great attention appears to have been given to a sound construction of the valves. Drain-aerating inlet valves were also shown, carried out on the same effective principles.

David Kirkaldy & Son.

The stand showed what may be termed a "museum," and of one of the most interesting kind in the practical demonstration of the effects of testing materials used for building purposes. Extra interest was added from the accepted reputation of this firm everywhere as the most reliable of experts. The margin of safety stresses, both thrusting and bending, is well



ART PLATES FROM "THE ARCHITECT."

Awarded Gold Medals, International Health Exhibition and Architectural and Building Trades Exhibition (1889).



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THE TOILERS OF THE DEEP. Two Tinted Ink Photographs. Size, Eighteen and a Half Inches by Thirteen and a Half Inches. Price Two Shillings. Free by post, carefully packed inside patent roller, Two Shillings and Three Pence.

JOHN SELL COTMAN'S PICTURES, lately on Exhibition at the Burlington Fine Arts Club. The Plates are uniform in size Twenty-one Inches by Fifteen Inches. The Titles are as follows:—1. Rouen from Mount St. Catherine. 2. Breaking the Clod. 3. View in North Wales. 4. Norman Arches. 5. Byland Abbey. 6. Norwich, from the Cromer Road. 7. Dewy Eve. 8. Mousehold Heath. 9. Cader Idris. 10. Castle Eden Dean, Durham. 11. Bamborough Castle. 12. The Interior of Norwich Cathedral. 13. Mountain Pass in the Tyrol. 14. Postwick Grove.

The price of the Set is Twelve Shillings and Six Pence; by post, carefully packed in patent roller, Thirteen Shillings. Kindly order early, as only a limited number of proof copies can be obtained.

May be obtained from all Newsagents, Booksellers, Messrs. W. H. SMITH & SON'S Bookstalls, or from the
Publisher, P. A. GILBERT WOOD, 175 Strand, London, W.C.

seen on inspection of the numerous examples that were shown in woodwork, ironwork, piping, &c.

Bristol Pennant Stone Quarries Company, Limited.

The specimens of various works executed in the Pennant stone were seen to advantage at the stand of the above-mentioned company. The stone has peculiarities that distinguish it from other kinds of stone. It has a distinctive (blueish) colour. It is valued from the west to the east of England in many districts for use as paving and curbing. Notwithstanding its hardness, it is worked up to a most perfect surface where required for monumental purposes, and neither the plain surfaces nor the sculptured enrichments seem affected by any number of years, though subject to stress of weather. For steps, paving, &c., it seems as durable as any other stone.

The Cannon Holloware Company.

Those concerned in the manufacture of the variety of appliances that were shown at the stand of the company, have persevered in spite of difficulties till they succeeded in manufacturing what may be called a perfect ware in the special line they show, which consists in sanitary goods lined with a beautiful surface of porcelain on metal. It might be called an enamelled surface rightly, but that description would not do proper justice, as it is a genuine lining of porcelain on metal, with a perfect roll edge. The process could be seen as applied to nearly every kind of article, from baths and lavatories to small bowls. These goods are already much in request by those who know them. There is no chance of pinholes which lead to oxidation and destruction, and no expense in painting them is requisite. The company may be congratulated on the immense variety of articles shown, manufactured under this process. We understand the process, though not very long introduced, has found general favour.

G. Shrewsbury,

of Station Road, Camberwell, showed various gas-baths, patent "Calda" bath-heaters, patent gas conservatory boilers and portable oil hot-water apparatus. The instantaneous heaters will provide a warm bath in ten minutes. To meet the wishes of many customers, Mr. Shrewsbury produced a new pattern patent "Calda," with flue-pipe and fitted with plain gas-burners made to swing for convenience in lighting. The original "Caldas," however, fitted with atmospheric gas-burners, can be safely used without a flue, being perfectly free from smoke or smell. They are still being extensively sold and can with confidence

be recommended, thousands of them being in use without inconvenience or danger resulting. There was also shown a new improved registered asbestos gas-fire, in different sizes, at very reasonable prices.

F. Nutt,

architectural carver, modeller and designer, of Gough Street, Gray's Inn Road, W.C., showed specimens of his excellent work. We should mention that he is prepared to execute any style of work connected with wood-carving, having had about fifteen years in a joinery factory, where he had charge of the department of wood-carving, and was entrusted to carry out all the plans and designs of architects.

Thomas C. Fawcett,

of Leeds (E. Breething, manager, Dunton Green, Sevenoaks) showed Breething & Fawcett's patent sand-faced power brick machine. The machine will make 12,000 to 15,000 (by double delivery), or 6,000 to 8,000 (by single delivery), perfect sand-faced bricks per day, free from sand flaws or air bubbles; in fact a perfect solid brick, either best facings or common clamp stocks, and as the bricks are moulded much stiffer than by hand they are not put out of shape by wheeling to hacks or drying floor, and one-third the usual drying ground is saved. It will mould any clay that can be moulded by hand, either light loam or the strongest clay. It is fitted with patent automatic sander, and effects a great saving in sand and labour. No wires are used, and the power to drive is little more than to drive an ordinary pugmill. The pugmill can be made to work either horizontal or vertical.

The Paragon Bolt Syndicate, Limited.

This company had on view the excellent "Paragon" bolt, the convenience, merits and advantages of which are known to all who have employed it. It will not, however, be out of place to enumerate some of the advantages, for as compared with ordinary bolts it possesses much greater strength, cost for cost, and exceeding neatness, no beading to be cut away for socket. It shoots smoothly and requires no force, the dropping of door does not affect working of bolt. It has no springs, and is practically everlasting. The upper bolt on door can be fixed within easy reach, not of necessity at the top of door as with other bolts. The "Paragon" bolts are excellently made and finished, well suited for use on the highest class of work for doors, casements, cabinet work, &c. The flanges and tubes of the bolts are made to take the holes bored by the standard

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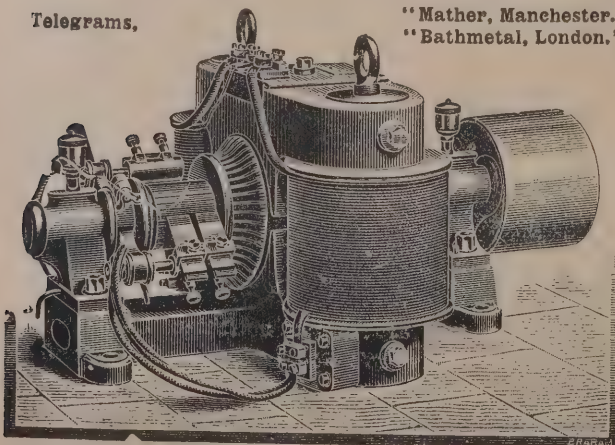
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sizes of centrebits and twist drills, the larger one being bored first. We can hardly better praise the "Paragon" bolts than by saying we advise all to try them. The "Pulopn" catch is another of their patents, and though only just introduced has been greatly approved of already. The special advantages claimed for it are as follows:—Ease in fixing, practically no wood to be cut away, no projection on door, entirely automatic, closing of second door effectively locks the first, doors though firmly closed require simple but definite pull to open, reaching up to the top bolt entirely done away with, cheap and durable, saves time, temper and thumbnails. These catches are strongly made and well finished, and in their various forms can be used in any position on doors, either for keeping them closed or holding them open.

W. H. Harling.

The display at this stand was unique. The exhibitor, Mr. W. H. Harling, mathematical, drawing and surveying instrument maker, of 47 Finsbury Pavement, London, E.C., had certainly a very fine exhibit. All the requisites for architectural and surveying work were shown—levels of various kinds, levelling staves and ranging poles, land chains and tapes. Drawing instruments, of which Mr. Harling has been the manufacturer for nearly half a century, have, as a result of such long experience, reached a state of great perfection, combined with moderate prices. The clinograph, a very useful instrument for drawing angles of any degree, tee and set squares, water-colours, and a few optical instruments help to fill up an exceedingly attractive case.

The Pickering Block and Hoist Company,

23 Mount Pleasant, Clerkenwell, was for all engaged or connected with building operations a most interesting and thoroughly practical exhibit of the excellent appliances and specialties of their firm. Among these were shown several types of hoists, and the utility of these for service on works in progress was amply demonstrated. A variety of patent pulley blocks of all sizes and types were to be seen, also a variety of cranes, winches, gin-blocks, lifting-jacks, wheels, chains, &c. The appliances could be shown in action; visitors kept those in management of the stand well employed in that respect. Some of Pickering's hoists should be mentioned by name as particularly useful, viz. the "Universal" friction hoist and the "Quick Sack Hoist," fitted with new duplex brake; the "Climax" self-sustaining warehouse hoist, &c. These hoists are inexpensive to fix as well as inexpensive in price.

The Plastic Marble Co., Limited,

showed admirable examples of the work they have produced. Beautiful chimney-pieces, pilasters, &c., were exhibited, and could not be distinguished from actual marble-work. The plastic marble is an artificial—in other words, a manufactured—material, but, as before implied, scarcely distinguishable from real marble. It can be applied for all uses where marble is employed, and, beyond that, for purposes where marble could not be used. Many will value it also as ironwork of any kind can be encased by it. From wall decoration to decorative table-tops is no doubt a long step, nevertheless these and the intermediate requirements are satisfactorily met by the use of plastic marble. Any reproduction of the best marble-work is possible.

Wood & Ivory, Limited,

of the Albion Blue Brick and Tile Works, West Bromwich, had on view their Staffordshire blue bricks, &c. Specimens of the South Staffordshire marl from which they are made were also shown. The blue brickwork is of the most enduring nature, and while so extensively used in all parts of this country, the demand for it abroad and in the colonies is very great. The order for the whole of the blue bricks required by Messrs. Morrison & Mason, Limited, for the contract for the Birmingham Waterworks has been placed with this firm.

D. Anderson & Son, Limited,

of Belfast and London, displayed their silicate cotton, or slag wool, for soundproofing and fireproofing buildings. Anderson's patent hair fabric, as a non-conductor for covering pipes, of the best kind. It can be easily fixed, the difficulties attending its fixing, which involved time and trouble, having been successfully overcome, and any person can easily fix it or again detach it. Besides the silicate cotton, which is used for all purposes where a perfect non-conducting material is needed, in addition to felts of different sorts, viz. what are termed roofing felts, sarking felt, foundation felt, patent inodorous felt, &c., there was a large show of vulcanised indiarubber goods for all purposes.

Shepwood Fireproof Structures.

At stand 113, the "Shepwood" system for fire and heat-resisting and ventilating structures was shown, viz. combined fire and heat-resisting floors and finished ceilings, and combined brick or tile and concrete partitions. For the floors arched tiles moulded in porous terra-cotta, or other suitable material,

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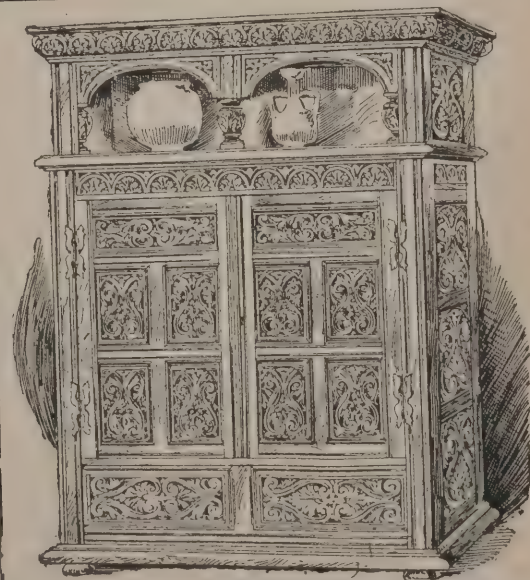
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Replica of an OLD ENGLISH Carved Oak Hall Press, 16th century, 5 feet wide, 7 feet 6 inches high.

ILLUSTRATIONS.

MUSIC.

NEW CO-OPERATIVE BRANCH STORES, PICTON STREET, LEEK.

ALMSHOUSES, FORD, BIDEFORD.

GREAT HALL AND STAIRCASE, GOSFORD HOUSE,
LONGNIDDRY, N.B.

are placed between rolled joists, spaced from 1 foot 6 inches to 3 feet or more apart, as required. The tiles are formed with skewbacks, and are so arranged that they can be placed in position after the rolled joists have been finally fixed. Concrete is run in between the skewbacks of the tiles and the rolled joists, encasing every part of the metal, including the under side of the lower flange, with a thick non-conducting layer, which is enclosed with terra-cotta or other suitable material. All main girders are completely encased in a similar manner. Concrete is filled in over the tiles in the usual way. The hollow spaces in the tiles run parallel with the joists, and ventilated air-spaces pass on either side of the joists for their whole length.

H. Hart,

of Commercial Road, E., had a large show of chimney-sweeping, drain-cleansing apparatus, &c., of which he is the manufacturer, being also an importer of malacca, rattan, bamboo and other canes. He has just completed the purchase of a large consignment of sweeps' long-jointed malaccas, and can offer a stouter and better quality cane than before at the same prices.

Thomas Potterton's

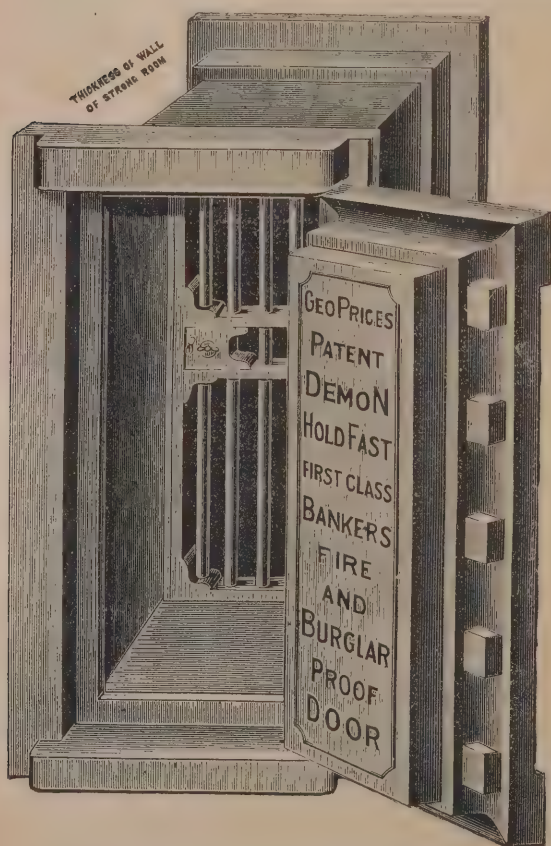
improved system of warming a house was found well worthy of attention by many persons. It is suitable for warming offices, hotels, restaurants, waiting-rooms, shops, warehouses, &c., or supplying hot water for dairies, manufacturing purposes, public baths, &c. Heat wasted from a kitchen fire is utilised, and Potterton's patent zigzag boiler can be fitted to any kitchen. The whole of a house can be warmed without having other fire in building except the kitchen fire, and no extra fuel for that is required. In cold weather a house can be kept warm all night. A special arrangement is provided by cistern, which will effectually prevent the pipes from freezing in cistern-room, and the radiators fixed about the house will have the same effect in other parts.

The Expanded Metal Company.

Conspicuously placed in the very centre of the Hall was the handsomely constructed pavilion of the Expanded Metal Company, in which the various qualities claimed by the company for their expanded metal lathing, &c., were effectually demonstrated. In it were to be seen *in situ* fireproof flooring, walls, cornice and column work, &c. It was surrounded by a balcony, also of expanded metal, the effect of which was excellent, and specimens of guards and fencing suitable for railways, farms, &c., were also shown. Since its original introduction to the building world as a lathing, this material has undergone many modifications and improvements, and now, in addition to its greatly increased value for building purposes, may be mentioned its suitability for fencing, gates, tree boxes, aviaries, lawn, horticultural and floricultural trellis-work, fowl runs, dog kennels, machinery, window and skylight guards, and for hundreds of purposes for which wire has heretofore been used. This company has purchased the patents and business of the British Metal Expansion Company, of West Hartlepool and London, and under the new process of manufacture can cut metal of any thickness up to a quarter of an inch.

The Andrews-Hawksley Patent Tread Company

showed in the Arcade their newly-introduced "Andrews patent reversible tread," which is made in three sections at prices ranging from 2s. to 2s. 9d. per foot super. The advantages claimed for this tread are safety, silence, strength, lightness and cheapness. In addition to ordinary stair treads, for which any of the sections may be employed according to the degree in which these qualities are required, this tread can be applied wherever a safe foothold is essential, such as for cellar flaps, covers for gas and water mains, hydrant covers, manhole covers for sewers, mats for public buildings, omnibuses, tramcars, railway carriages, passenger steamers, &c. The light section is specially suitable for small treads, such as tram and 'bus staircases, railway signal ladders, &c., where safety is essential and no great strength necessary. The tread being reversible is calculated to last four times as long as an ordinary tread. When the front blocks are worn (in about seven years), the tread can be turned round and the back blocks brought to the front. When these in turn are worn down (another seven years), the tread can be turned over and the other side worn in a similar manner, giving a total life of say thirty years.



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Beckett & Co.'s Old Bank, Leeds, and all Branches.

&c., &c.

H. Hermann, Limited.

Owing to its conspicuous position and artistic appearance, Messrs. Hermann's exhibit attracted a large share of attention to the beauty of the carving produced by this firm, and to which we referred in our issue of the 22nd ult. The exhibit took the form of a pavilion, the interior of which was cosily arranged with a richly carved mantel and overmantel, an equally elaborately carved and ingeniously contrived bookcase and writing-table combined, framed *bassi-relievi*, &c., and on the outside were tastefully disposed carved panels, ranging from the simplest designs to the most ornate, and suitable to all purposes to which this form of decoration can possibly be applied.

C. G. Picking & Co.

This firm showed a practical application of their patent twin arch interlocking fireproof flooring, for which they claim the maximum of strength with the minimum of weight and thickness. These desiderata have been secured by adapting to hollow tubular blocks the twin-arch design, combined with the employment in their manufacture of a material that is both strong and refractory. The lateral interlocking arrangement is a most important feature in the design and the additional strength and security thereby attained needs no demonstration. The sections are in 2-feet working lengths and so made as to completely encase the under flange of the supporting girders. This floor does not need the extraneous aid of concrete to give it strength, and there is consequently no temptation to economise weight by the employment in the concrete of a combustible material like coke breeze, as is sometimes the case. The double-arched blocks possess in themselves the requisite strength, and without the addition of concrete will carry a safe load of 5 cwt. per square foot. They need only the covering of fire-resisting grout, supplied with them, to form a homogeneous floor. The finished face may be of wood, tiles, stone, or cement. Such a floor does not exceed 6 inches in depth and the value of the saving in head room on each floor throughout a high building will be at once appreciated by all conversant with building construction. On the other hand, if for any special reason a heavier and thicker floor is required, there is no obstacle to such being constructed. The soffits of the tiles are provided with dovetailed ribs that give a substantial key for plastering. Plaster so fixed has remained intact under severe fire test. The same principle is adapted to walls, partitions, &c. Messrs. Picking & Co. are also showing their new patent conduit for electric light mains,

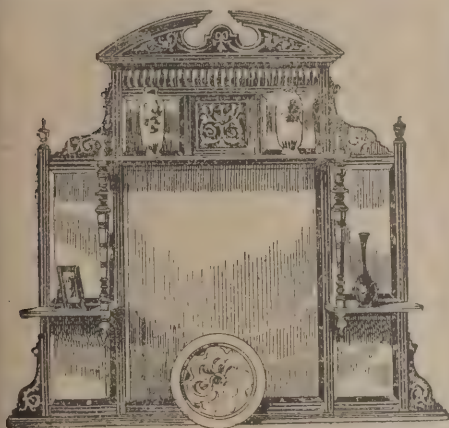
telephone and telegraph wires, &c, which has been designed to provide a simple, efficient and permanent underground casing for insulated cables, &c. It is made in hard burnt earthenware, and each length is coated internally and externally with bituminous matter (of which all joints are also made), which thoroughly combines with the earthenware, giving it a glass-like surface which will not peel off and cannot be removed. Among the advantages claimed for this conduit are its great strength, which will withstand a high crushing strain; that it is a non-conductor of electricity, is gas and water-tight, and thoroughly proof against any chemical action that may be set up by acids or gases found in the ground in which it is laid. The material of which the conduit is composed is not affected by any change of temperature; it neither expands nor contracts, joints therefore cannot be strained or broken. A most important point in connection with this system is that no condensation arises, as in stoneware or iron, and short circuiting from this or any other cause cannot occur. It is supplied in lengths of 3 feet of various sections and sizes, as may be required, and carrying from one to seven or any other number of cables. Each duct is intended to carry one cable or ribbon, and the internal edges of all the joints are well rounded, to prevent the main from chafing when being drawn in or out.

G. J. Farrow.

Conspicuously towering above all the other exhibits Mr. Farrow's improved portable iron scaffold attracted attention. The advantages claimed for these scaffolds are speed in erection, adaptability to the height of any room or building, movability in any direction upon castor-wheels, the tyres of which are of indiarubber, and they are carted, erected, taken down and removed without any trouble to the hirer. It is a portable fabric formed of iron tubes which fit into each other like the portions of an iron bedstead. The patentee informs us that a scaffold of this kind may be set up at about one-fourth of the cost of the old-fashioned sort, and as it may be built of any height up to 100 feet, it is admirably adapted for the cleaning or repairing of lofty roofs and ceilings, and especially so in cases where the cost and cumbrousness of the old system would be prohibitive or nearly so.

W. Parham.

Mr. Parham claims that his are the "best cheap green-houses ever offered," and judging by his exhibit, he is no doubt in a position to substantiate this not too modest claim,



HANDSOME INLAID ROSEWOOD OVERMANTEL,
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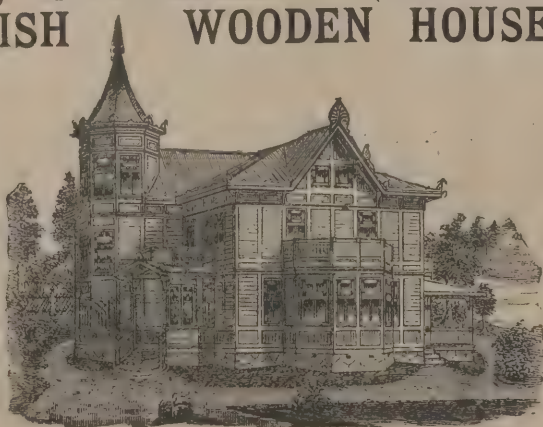
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for the houses shown were well designed and finished, and can be put up at a wonderfully small cost, the cheapest somewhere about fifty shillings. They are made of well-seasoned red deal, and include matchboard base, sash-door with rim lock and brass furniture, ventilating sashes with iron openers painted one coat in oil, 16-oz glass and materials for stages on each side. They are made up in sections, the ends and sides being complete, and only requiring to be screwed together at corners and the rafters laid on. Any handy-man can put one together in three or four hours.

W. A. Smith,

of Northampton, in his display of machinery and mechanical apparatus, showed a cross-cut pendulum saw, to take 24-inch saw; a planing machine, with rising and falling bed; set crushing rolls in frame, 3 feet long by 18 inches diameter; an iron circular saw-bench, to take 36-inch saw, fitted with one new 30-inch saw, fast and loose pulleys, and throwing-out gear; wrought-iron brick trucks; and an assortment of accessories for brickyards, &c.

Henry Bassant

had an unusually fine display of his parquet flooring. For a perfect floor combined with pleasing effects gained by arrangement of different woods, nothing better could be seen. The teak wood parquet flooring speaks for itself and needs no further recommendation.

E. S. Hindley,

of Bourton, Dorset, showed his steam-engines, horizontal and vertical, hoisting and winding engines, semi-portable and winding engines, high-speed engines, and also vertical boilers, Cornish boilers, multitubular boilers, colonial boilers, &c. Also the "Bourton" donkey feed pump and sawing machinery, circular saw bench and circular band saw machines.

Stourbridge Brick Company.

This company had a large display of their manufactures in fire-brick goods, and this line of work was admirably shown by them, nearly every variety for all purposes and all sizes being seen. Sanitary goods were also well represented, and among them excellent closets and appliances in connection. A small model railway truck was seen, loaded with the fire-clay from which the fire-clay goods are made. As a display of fire-brick wares, such a display could seldom be seen at any exhibition.

W. Osment & Co.,

of Clapton, had a particularly good exhibit of his productions in joinery and turnery. The improved machinery for producing the work patented by the firm is evidently successful, the work being so perfectly executed in the shortest possible time. It also spoke well for the articles displayed that little or no time has been given to "finishing them up," as is so often required to be added to machine-worked goods. Samples were shown in great variety—balusters, railing, newels, &c., most elegant specimens of woodwork, and to which we strongly invite the attention of architects, builders, &c., and the general public. Many new and excellent designs were shown as lately executed. The firm's registered system of subdivided panels worked from the solid wood, and so much superior to the usual run of this kind of work, was well shown. Messrs. Osment & Co.'s exhibit was one of the best we have seen for a long time.

Hall, Beddall & Co.

had a first-class exhibit from the point of view of a sanitarian, as they showed their patent sanitary dust-trap, which is adapted for fixing in either brick or iron shafts, where several floors or flats have access by means of openings for the purpose of emptying dust or refuse into a shoot. The defects, not only disagreeable, but also injurious to health, of the ordinary hopper arrangement are by this time well known, and these defects have been eliminated by the patent sanitary dust-trap of Messrs. Hall, Beddall & Co. However carelessly handled it cannot be opened to the shoot and the house at the same time, and the working is very simple. The system has already been largely adopted.

Samuel, Sons & Benjamin,

of Fenchurch Street, E.C., showed Gurney's low-pressure hot-water heaters and radiators. This system has been extensively used in Canada and the United States for over half a century, and having had many orders and inquiries from home, the Gurney Foundry Company, Limited, have established a depot in London. Canada has one advantage over home—that it is always well prepared to meet cold weather. Among the appliances are the Oxford hot-water heater, said to be the quickest in circulation of any low-pressure known—an assertion we are not inclined to controvert after seeing it in action. The Oxford double-crown hot-water heater, the Oxford quilted radiators, and other hot-water and steam radiators. Messrs. Palowkar & Sons have recently taken many important contracts in London.

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All the above remarks are Guaranteed, being the results of Practical Tests.

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IMMOVABLE ACME

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Yates, Haywood & Co.

Among the varied goods that comprised the exhibit of Messrs. Yates, Haywood & Co. were specially to be noted their new patent "Quadrant" kitchener, an article of substantial construction, made with exquisite finish, and having for its special feature a self-adjusting lifting-fire, which can be raised or lowered to any point with one hand. The movable parts do not come in contact with the fire, consequently there is no wedging or getting out of order. The range fire cheeks and back boiler can be taken out without disturbing any other part of the kitchener. This kitchener is made with over and under draught ovens, and can be made with enclosed iron flues, requiring no brickwork setting. They had also from their large warehouses and showrooms, 95 Upper Thames Street, samples of very highly finished baths, with rolled edges and mahogany capping; also a very considerable selection of wood mantels and over-mantels in oak, mahogany, and white wood, of artistic design and exquisite workmanship, filled with ornamental tile stoves with electro-bronze decorations; tile hearths, fenders, and fire brasses. A selection of very handsomely carved marble chimneys in Carrara marble have attracted a great deal of attention, the designs being Louis XIV. and of the Adam type. These, together with this firm's specialty in marble chimneys, viz. their Lavande Ecossais and gris rouge samples, comprise groups of marbles at once handsome in design and beautiful in colour. A specialty in cooking ranges—to supply a demand much increasing by the erection of artisans' dwellings in the Metropolis—is Yates, Haywood & Co.'s "Guinness" patented self-setter range. The oven of this range can be easily removed at will, exposing the whole internal construction of the range to view, and making it very easy to clean the flues, however much neglected, and to repair any part without taking the kitchener out of position.

Joseph Williamson & Co.,

Midland Foundry, Wellingborough, Stand 186, exhibited their "improved Graphic" self-setting, open and close, and lifting fire ranges, a 6-foot size of which is shown in action. This firm's ranges combine all the latest improvements of this "up-to-date" age. The lifting fire can be regulated to a depth of from 12 to 6 inches in one movement, and has the advantage of possessing vertical bars, not shaped, and has no slots or ratchets at sides or centres to get out of order, or to obstruct roasting in front. The lifting portion of these ranges consists of a

"cam," which is fixed in position under the bottom grate, and away from the action of the fire. A novel feature of these ranges is the patent rising table to the fire, which rises and falls, being always on the same level as the fire, and which can be detached instantly. This firm claims that this is the only range made with this useful table. These ranges require no brick flues, being self-setting, having enclosed cast-iron flues. The hot plate is extra deep and of thick metal. The ovens (the fronts of which are particularly bold and striking) are very large, and run back the entire depth of the hot plate—special provision has been made for their efficient ventilation by a simple arrangement of dampers. These ovens can be heated top and bottom at the same temperature by their special under draught, the flames from the fire passing completely round the oven. By the arrangement of the ashpans hopper the fire is convertible at will into slow or semi-slow combustion, thus effecting an enormous economy in the consumption of fuel. We understand that these ranges are made all sizes, and, although those shown have handsome tile coves and tile jamb mouldings, the prices can be considerably reduced by having iron coves. To architects and others who require a good-looking, well-finished, self-setting range, we would recommend them to apply to Messrs. Williamson & Co. for lists and prices. We understand that Mr. J. Yeomans, of Roehampton Lane, S.W., who is the London and country representative of this firm, and who has had many years of practical experience in the trade, has designed these "improved Graphic" ranges.

Ellis, Partridge & Co.

At Stand No. 7, Messrs. Ellis, Partridge & Co. (of Leicester and London) exhibited red-facing bricks and ornamental brickwork from their Redbank Works, Measham, and also their Woodville Works, Burton-on-Trent. Their exhibit surpassed their previous efforts in the excellence of the quality of the bricks, &c., shown, and in the great variety of designs, which numbered several hundred. During the past year the firm have put down new and improved machinery by which the manufacture has been brought as near perfection as possible, and the output considerably increased. No effort is spared to keep pace with the times. The Redbank works are now lighted by electricity. The firm claim, and apparently with good reason, that their moulded and ornamental bricks are unsurpassed for finish and clear, true lines, a point most essential where first-rate work is required. "Redbank" bricks are

THE COPAL VARNISH COMPANY, LTD.

MANUFACTURERS OF

PARIS WHITE JAPAN,

A pure white and inexpensive decoration for Bath and Bed-rooms, Restaurants, Hospitals, &c.

Full particulars will be sent on application.

PALMERSTON BUILDINGS, LONDON, E.C.



RANDALL'S ADAMANTINE ENAMEL,

The most effective preventative of Damp Walls.

FINEST VARNISHES

FOR HIGH-CLASS DECORATION.

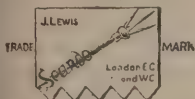
AND EGHAM, NEAR WINDSOR.

THE "ECLIPSE" PAINT REMOVER & CLEANSER.

The Best, Cheapest, and Most Effective in the World.

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WEATHERVANE, LONDON, "Lewis Link" (Patented) is the only Coupling made in a Single Piece for



LIGHTNING CONDUCTORS.

6 & 6 Great Winchester St., London, E.C. J. LEWIS.

PRIZE MEDAL, ELECTRICAL EXHIBITION, CRYSTAL PALACE, 1892.

J. G. WELLER, WIRE WORK MANUFACTURER,

50 DORSET STREET, BAKER STREET, W.

Garden Arches 7 ft., 4 ft., 1 ft., out of ground, made of Wrought-Iron Frame, Wired with 3 in. Diamond Work. Nuts and Bolts complete, 4s. 6d. All work galvanised after made. Established 1869. Netting, Pea Guards 8 ft. long 8s. 6d. per doz. Diamond Pea Guards made of hard wire with two stays, 4s. 6d. per doz. End pieces 1s. per doz. Carriage Paid on all orders for 10s. and upwards. Factory:—

KILBURN WIRE WORKS, 286 HIGH ROAD, KILBURN.

W. C. BRYANT, MARBLE MERCHANT,

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DEVILLERS & CO., LIMITED, ERQUELINNES, BELGIUM.

FOR ALL KINDS OF MARBLE WORK,

CHIMNEY-PIECES, WALL-LININGS, COLUMNS, STEPS, ETC.



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ROYAL

LETTERS PATENT.

Established A.D. 1774.

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NEW IMPERIAL PATENT

SUPERFINE FLAX LINE.

The above article is now being manufactured and sold in large quantities for Greenhouse Sashes, Public-house Shutters, and other heavy work. The Manufacturers would recommend it for its strength, and the large amount of wear in it, consequent on its peculiar manufacture.

AUSTIN'S IMPERIAL PATENT FLAX SASH AND BLIND LINES (two Prize Medals awarded). The Manufacturers of the above articles particularly wish to draw the attention of the trade to their Imperial Patent Flax Sash Lines, of which they are now making six qualities, all of which they can strongly recommend, as they have given unqualified satisfaction to the trade for now over One Hundred Years, and the Proprietors continue to give their personal attention to the manufacture of these goods.

They also invite the particular attention of the trade to their IMPERIAL PATENT BLIND LINES, which are very superior to anything yet offered.

They can be obtained of all Ropemakers, Ironmongers, Merchants, Factors and Wholesale Houses in town and country.

N.B.—Please note that all our goods, as advertised above, are labelled either inside or outside with our Trade Mark—The Anchor.

WOOLPITS, SURREY. FOR SIR HENRY DOULTON.

BY ERNEST GEORGE AND PETO.

PROOFS of this Illustration, which appeared in "The Architect" on June 6, 1885 (now out of print), can be obtained on application to the Publisher, price Sixpence each, post free; on roller, Ninepence.

thoroughly weather-resisting, and now widely used for public buildings not only in London, the Home Counties, and throughout the Midlands, but are even sent as far north as Yorkshire and Northumberland. The "Woodville" sand stocks are also very popular for the building of churches, country mansions and suburban villas, &c., being rich in colour and very similar to Fareham and other south country makes.

The Copal Varnish Company.

The well arranged stand of this company showed off to advantage the various excellent qualities of the paints, enamels and varnishes manufactured by them. Conspicuous among these were Randall's Paris White Japan, a pure white decoration for bath and bedrooms, hospital wards, &c. It is inexpensive, and can be supplied in any tint of colour. It has a magnificent gloss, but can be flatted if preferred. Randall's Paris White Japan evidently keeps its colour and brilliance very well, as a panel was exhibited which was prepared for the Kimberley exhibition, 1892 (where it obtained a gold medal); this is still in excellent condition. Randall's Adamantine Enamel, a most effective preventative against damp walls, is also very useful for putting on plastered walls and ceilings before painting or distempering. A large collection of varnished wood panels showed the fine brilliance and body of the varnishes made by this firm, and their excellent flowing capacity was also advantageously demonstrated. The special advantages possessed by the Copal Varnish Company's varnishes are their great brilliancy, durability and freedom from bloom.

M. Tibbitts,

of New Southgate, North London, is the inventor and patentee of the slow-combustion plate, or improved air-supply regulator for stoves, which can be applied to any register or other open stove and open kitchen ranges for economising fuel and obtaining more heat. Though only introduced during the last twelve months, it has given the greatest possible satisfaction to all who have tried it. It is applicable both to the ordinary register or open stove in sitting-rooms, for the purpose of saving the consumption of fuel and obtaining more heat, also to open kitchen ranges, for saving fuel, obtaining more heat for roasting, &c. It consists of an iron plate, the size of the bottom of the stove or range, with two doors running in slides and opened and shut by levers. The plate is fixed on the bottom of the stove or range right underneath by the aid of two small screws and nuts, which hold it up to the bottom. When the doors are

open (for lighting the fire or drawing it up) the levers or handles very slightly project out in front. When the doors are closed (to obtain slow combustion and draw out the heat) the levers or handles will be as far from one another as possible and hidden under the bottom bar of the grate.

Baird, Thompson & Co.

made an excellent display of their ventilating appliances, which we have so often drawn our readers' attention to. Also there was noticed their drain-test machine, than which nothing could be more perfect. The merits of the new turret ventilators were well shown by models. The exhibit did justice to Messrs. Baird, Thompson & Co., being a very good indication of their success as ventilating, heating, sanitary and consulting engineers.

Albion Clay Company, Limited,

gave a very interesting display of their goods. Several new departures have been made by this company in the way of excellent and improved sanitary appliances. We can only describe one at present, and it is their patent channel bend for manholes and inspection chambers. These bends have been designed to prevent the splashing which now takes place in the chambers. The improvement consists in arching over the lower or outlet end of the bend. A lip or bend is also formed in the upper wall of the channel bend, whereby the sewage in striking the same is deposited directly into the main channel instead of bending opposite. Another improvement consists of leaving on the socket end a portion of the pipe cut so as to be parallel with the brickwork, which the bend at present in use does not possess, and cutting away the brickwork is necessitated. A description of other novelties shown by this firm must for the present be deferred.

Callender's Bitumen Telegraph and Waterproof Company, Limited,

provided a show of their specialties, from the point of view of architects, contractors, &c., very useful. Also were shown their manufactures connected with insulation of electric wires, cables, &c. What they term the "pure bitumen damp course" is to be recommended, as it will stand results in use. We would describe it as a combination of canvas and of pure bitumen as obtained from the asphaltum lake in Trinidad. No damp course, to our knowledge, has proved altogether lasting if of hard and fast material. The best of constructed buildings after erection settle, and in that settlement, however small it

THE WELL-KNOWN FRIEZE, ENTITLED

"THE CORN FIELD."

- | | |
|------------------------------------|-------------|
| 1. Ploughing. | 3. Mowing. |
| 2. Harrowing. | 4. Carting. |
| 5. The Products of the Corn Field. | |

Length, Fourteen Feet Seven Inches by Fifteen Inches deep.

A SPLENDID EXAMPLE OF COLOUR-WORK IN PERMANENT INK PHOTO, BY
M. PAUL ALBERT BAUDOIN.

This magnificent Illustration was presented to the Subscribers to "The Architect" in 1886. A few Proofs were taken, which immediately became out of print.

OPINIONS OF THE PRESS.

"We are not surprised to hear that there has been a great demand for the beautiful reproductions of the well-known frieze by M. Paul Albert Baudoin, entitled 'The Corn Field.' The plates have been reproduced by subscription at half a guinea the set, and so great has been their success that a second edition is being issued."—THE LADY'S PICTORIAL.

"They are beautifully done in colours by the permanent ink photo process, and form a very artistic and pleasing set at the extremely moderate price of half a guinea."—THE STAGE.

"The well-known frieze entitled 'The Corn Field,' which is a splendid example of colour-work in permanent ink photo, by M. Paul Albert Baudoin, is to be reproduced by subscription of half a guinea a set. They are exceedingly artistic, and would grace the walls of any house."—THE GENTLEWOMAN.

AND NUMEROUS OTHERS.

In consequence of the almost daily demand for these Plates, they have been reproduced by Subscription at Half a Guinea the Set, and are now ready for issuing.

P. A. GILBERT WOOD, 175 STRAND, W.C.

May be had framed in Solid Oak Frames with Mounts, at Three Guineas the set of Five Plates.

may be, it disturbs any kind of damp courses that are rigid or even slightly rigid. Some play must be allowed while calculating that buildings are liable to settle. This difficulty is apparently exactly met by what we have termed a combination damp course of bitumen and canvas. The tests of experts corroborate our remarks.

R. Morris & Son.

Messrs. Morris & Son are to be congratulated on their fine show in glass work and decorations on glass. Their ability in design and execution were well shown. The display was what most will term a magnificent one, though many are well acquainted with the lovely effects that can be produced on glass. In addition to excellent fascia work and lettering, the samples of ornamental work represented landscape views, &c, floral work, bird and insect life, &c, of the most pleasing description.

H. F. Buchan & Co.

showed their improved sink and lavatories, traps, thimbles, &c., as approved and adopted by the County Council. One feature was their soil-pipe junction, with patent disconnecting metallic joint to fit any closet outlet. The exhibit was an interesting one, and we trust it received the attention it deserved.

Gray's Chalk Quarries Co., Limited.

The non-porous bricks were shown at the stand of this firm. Dwarf structures also exemplified the use of brickwork in practice. One claim is that this company are the only manufacturers of non-porous brickwork. A window opening had also been constructed to give visitors an opportunity of judging of its decorated effect, aided by combination of colour in brickwork.

T. Freeman

Mr. T. Freeman, of Phoenix Street, St. Pancras, exhibited at his Stand (No. 117A) a very choice collection of art tiles, glazed and vitreous, the product of works in which he is interested in the potteries.

At the same stand J. Fielding, of Beggar's Well Quarries, Alton (London offices and stores, 200 and 202 Phoenix Street, St. Pancras), showed samples of red sandstone in various forms. These quarries have the credit of producing some of the largest blocks obtainable in the kingdom, without faults or anything detrimental to durability or appearance. As an indication of the excellence of the stone, it has recently been

selected by Messrs. Giles, Gough & Trollope, of Craven Street, for the extensive asylum in process of erection at Cheddleton (about 50,000 cubic feet of the stone being prepared for the building). We are informed the following architects have adopted this stone in several churches and public buildings, viz.:—Sir Arthur Blomfield & Sons, the late Ewan Christian, and the late A. W. Pugin.

Also the Midland Glazed Brick Co., Limited (London offices and stores, 200 and 202 Phoenix Street, St. Pancras), exhibited a well-selected assortment of white and coloured glazed bricks. They appear to maintain the reputation of this company, who claim from the hardness of their glaze and strength of their clay an absolute immunity from the scaling and crazing which is too often seen in other bricks.

Morgan & Co.

Messrs. Morgan & Co. showed working models of Nowell's patent reversible sliding sash-window, and patent reversible French casement. Simplicity is the strong feature in these sashes, and the reversible fittings, which are durable and inexpensive, can be easily applied to all existing windows, and their adoption enables all cleaning, painting and glazing operations to be carried on from the inside of the room, thereby obviating the risk of accident.

James B. Petter

had a handsome display of various patterns of his patent Nautilus grate, which is a fire-brick lined, slow-combustion, smoke-consuming portable dog stove, in form resembling a nautilus shell or volute, and is an artistic, scientific, economical, cleanly and powerful fireplace. A delightful warmth is radiated directly from a bright and glowing open fire, and indirectly from its outer case, an equal temperature being maintained throughout the apartment. A register door, for sweeping, encloses the chimney immediately over the grate, thus obviating any waste of heat, and provision is made for regulating the draught to the greatest nicety, whereby the fuel consumption is claimed to be marvellously small. Another variety is the patent "Mail-Clad" stove, which has enormous heating capacity. The patent "Mermaid" boiler is also shown. This is so constructed that any incrustation arising within it falls to the bottom, away from the action of the fire. Its large capacity renders a hot-water cistern unnecessary in moderate sized households. The "Yeovil-Leamington" kitchen range with "Mermaid" boiler complete is also shown.

AGRICULTURAL
HALL.

L. V. RILEY & CO.,
SHIRLEY HOUSE,
10 THROGMORTON AVENUE, E.C.
ELECTRICAL ENGINEERS.
SPECIALTY OF
ARTISTIC HOUSE LIGHTING.
ART METAL WORK.

STALL 26.
ROW A.



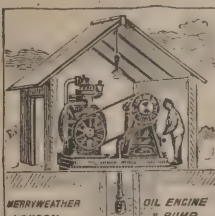
MERRYWEATHER'S

"WATER SUPPLY TO MANSIONS."

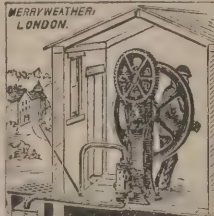
The "Times" says:—"A Practical Pamphlet."



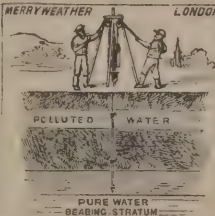
Horse, Donkey, and
Bullock Pump.



Oil-Engine Pump, $\frac{1}{2}$ per
hour per h.p.



Geared Manual Force
Pump.



Finding Water.
Wells Driven and Bored.

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MERRYWEATHER'S, 63 Long Acre,
64 GOLD MEDALS. London, W.C.

ESTABLISHED 202 YEARS.

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IS THE
BEST FOR ALL PURPOSES.

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Is a thorough Cure
for Damp Walls, and
is made
IN ALL COLOURS
and COLOURLESS.

A SILVER MEDAL was awarded at the
INTERNATIONAL HEALTH EXHIBI-
TION, 1884, for Excellence and Durability.

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Established 1860.

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THE LONDON GUARANTEE & ACCIDENT
COMPANY (Limited) issue Bonds as security on behalf of
Contractors or Builders for the due performance of Govern-
ment, Municipal, or other Contracts of every description at
moderate rates. Office, 61 Moorgate Street, London, E.C.
The Bonds of this Company are accepted by the several
Government Departments.

Architects, Builders, and Manufacturers
should all read top Advertisement on
page xiii.

Mr. Petter attaches great importance to his Sou'-Wester roof-plate, which is adjustable to all roofs, ship decks, &c., and consists of two castings, a plate having a dome on its upper service with a hole through same, and a nozzle with a flange around its bottom edge fitting on the dome and forming a ball-joint adjustable to any pitch of roof, ship's deck, &c. The plate is fastened to the rafter in the usual way and the nozzle then placed on the dome, being secured with the bolts through the holes arranged to take them. The lower or taper part of the nozzle receives the pipe from within the building, and the top or spigot end carries that used above the roof.

Martin, Earle & Co.

This firm, whose well-known cement factory at Rochester has recently undergone extensive alterations, while their plant has at the same time been greatly increased and improved, are now in a position to double their late output of Portland cement, tested briquettes of which they had on show. This cement, which has a high reputation for high burning and fine grinding, contains no Kentish ragstone, and is in fact guaranteed absolutely free from adulteration of any kind. Messrs. Martin, Earle & Co. have received from Messrs. Stanger & Blount a report on the strain-resisting qualities of their cement, with which they are justly so satisfied that they have had it reproduced in facsimile and will be glad to send a copy of it to anyone interested in such matters.

Linoleum Tile Company.

This company, whose exhibit occupied the same position as last year, displayed a varied collection of patterns, among which were several new ones. Among these were a rich design in Oriental style, of which the colouring is particularly good. Our readers are for the most part familiar with the advantages possessed by this system of solid inlaid floor covering; but for the information of those who are not, we may mention the following:—They are noiseless and pleasant to walk on, waterproof and warm to the feet, not slippery, and will neither buckle nor blister. The colours and pattern retain their brightness after years of wear, as they are solid, go right through to the backing, and consequently do not fade until the material itself is actually worn away. Any pattern can be renewed at a few days' notice, whereas the ordinary designs in linoleum, &c., can seldom be matched after once being laid down. When any special part becomes worn, or accidentally damaged,

it can immediately be replaced without disturbing the remainder of the floor-covering, thus effecting a great saving in renewals. The unavoidable waste of material which occurs in fitting awkward corners and other recesses, with coverings made from the piece, is entirely obviated by this system, as the linoleum tile is cut in sections varying in size. The tiles can be laid on wood, stone, or cement, and have the same artistic appearance as encaustic tiles, without being so expensive. Any variety of colours can be had in heraldic, æsthetic, grotesque, or other designs, and any pattern, crest, or monogram, can be made and delivered within a few days from date of order. The effect of these tiles is greatly enhanced if they are polished with beeswax after cleaning.

Edward Harris

showed three working model sash frames with reversible sashes, of admirable simplicity, arranged so that the glass on the outside can be cleaned inside of a room, and thus avoid the danger of ladders and sitting on sills of windows for the purpose. They are efficacious and inexpensive.

A novelty was shown by the Imperial Manufacturing Company in the way of a fire-lighter. Architects and builders have to furnish houses for the public to live in. Among other necessary fittings of the dwelling, fireplaces are provided, and this company has come to aid the public by helping them to more easily use what the builder has fixed in regard of fireplaces, &c. The fire-lighter has been tried by a number of persons during the past week; the cost is practically nil, and it has been so much appreciated that we are pleased to call our readers' attention to it.

The following are the results of the handicrafts competitions on March 30, the judges being Professor Banister Fletcher, Messrs. A. Baker, H. Dawson, B. F. Dicksee, F. Farrow, W. Grellie, F. Hooper, H. Leonard, J. S. Quilter, H. D. Searleswood, W. C. Street, and the hon. secs. H. Phillips Fletcher and T. Locke Worthington. *Bricklayer*: Bronze medals to T. H. Smith and John Burgoyne; certificate of merit to Frank Mills. *Carpenter*: Silver medal to W. Wyatt; bronze medal to A. S. Sewell; certificate of merit to S. Evans. *Joiner*: The work not considered of sufficient merit to award medals or prizes. *Mason*: Bronze medals to Francis Montague and Albert Sugg; certificate of merit to John Hawley. *Modelling in Clay*: Silver medal to C. Giddings; bronze medals to A. H. Borrondale; bronze medals to Robert Bussey and P. J. M. White. *Painter and Decorator*: Bronze medal to S. Moore. *Plasterer*:



Manufacturers of Wrought Metal Work, Architectural Carving and Joinery for Ecclesiastical Purposes, Domestic and Public Buildings, Lighting Appliances, &c.

Estimates given to Architects' own designs.
Work can be inspected during execution.

Showrooms:—79 Edmund Street, BIRMINGHAM; 43 Great Russell Street, LONDON, W.C.; Concert Street, Bold Street, LIVERPOOL.

WORKS:—Eagle Works, Hornsey, N.; Porchester Street, Birmingham.

THE SOUTHAMPTON STEAM JOINERY CO., BELVEDERE WORKS, SOUTHAMPTON.

London Office: 11 Clement's Inn, Strand, W.C. Estimates supplied.

Manufacturers of **JOINERY** suitable for all purposes, from the Cottage to the highest class of Mansion and Public Building.

IN HARD OR SOFT WOODS.

Church, Bank, Office, Shop, Ship, Yacht and other Fittings. School Seats and Desks. Chimneypieces. Horticultural Buildings, &c.

MOULDINGS. ELECTRIC LIGHT CABLE CASINGS AND COVERS.

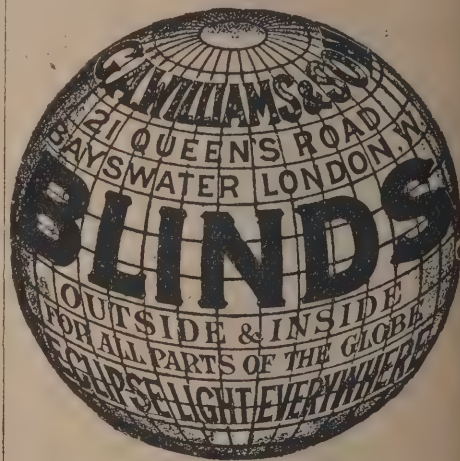
STEAM SAWING, PLANING, AND MOULDING MILLS.

Joinery and Fittings have been manufactured at these Works (which are the largest in the South of England) for some of the most important buildings in this Country and Abroad.

F. J. NOLF,
CHISWELL HOUSE, FINSBURY PAVEMENT, LONDON, E.C.
MARBLE MERCHANTS AND MANUFACTURERS.

Estimates given on receipt of Plans, &c., for all kinds of Marble and Granite Work. Chimney Pieces, Slips, Fenders, Wall Linings, Floors, Steps, Columns, Capitals, Bases, &c.

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ELECTRIC BELLS

And **TELEPHONES** erected in private Houses, Offices, Factories, &c., in Town or Country. Best workmanship and materials only.

All work supervised personally, and guaranteed for 12 months. Maintenance contracts entered into.

E. P. ALLAM & CO., 49 Finsbury Pavement, E.C.

ARCHITECTS, BUILDERS, and MANUFACTURERS should all read top Advertisement on page xiii.

Bronze medal to Alfred Brown; certificate of merit to W. T. Drew. *Plumber*: Silver medal to G. Crabbe; bronze medal to A. W. Walter; certificates of merit to W. J. G. Fraquair and W. Webb. *Tile-fixer*: Bronze medal to Henry Lambert.

(To be concluded.)

In conclusion we may say that the exhibition, which was closed yesterday by their Royal Highnesses the Duke and Duchess of Fife, has been a pronounced success, and the able managing director, Mr. Montgomery, and the Council of Architects are to be congratulated on the perfect way in which the work of the exhibition has been carried out. During the last week the musical arrangements have been under the supervision of Mr. Glenn Wesley, and have been a great success.

TRADE NOTES.

In the construction of the Friargate Board Schools, Scarborough, Mr. J. C. Petch, architect, great attention is given to the ventilation, for which the "Climax" latest improved invisible roof ventilators, supplied by Messrs. Cousland & Mackay, ventilating engineers, Glasgow, are being used.

A NEW turret clock at the Chorlton-cum-Hardy Conservative Club, Manchester, erected by public subscription by all shades of politics and denominations, was set going at four o'clock on Saturday last, the 30th inst, by Mr. Bingham, chairman of the Local Board. The clock shows the time upon three external illuminated dials, and strikes the hours upon a bell placed in the turret. The work has been executed by Messrs. W. Potts & Son, clock manufacturers, of Leeds and Newcastle-on-Tyne.

MR. J. ARNOLD, of St. Paul's Road, Camden Town, N.W., has recently shown us samples of a very fine clean sand which he is supplying for the North-Eastern Hospital, Homerton. Samples of this sand have been recently exhibited by him at the Building Trades Exhibition at the Agricultural Hall, and were very favourably spoken of by architects and builders.

THE Wimbledon Cemetery Chapels, Wimbledon, are being warmed and ventilated by means of Shorland's patent Manchester stoves, with descending smoke flues, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

VARIETIES.

AN excellent likeness of Mr. G. H. Rayner, F.S.P.A., the writer of our weekly article on patents, appears in the current number of *St. Paul's*.

WE have pleasure in directing our readers to the top advertisement upon page xiii. of this issue, referring to the newly-established "Exchange." It appears from a perusal of the prospectus to be an excellent institution, and from the very reasonable offer the proprietors make as a test to the utility of such an Exchange, we think it is worthy of careful attention.

MR. JNO. WOOLLEY, the railway contractor, died somewhat suddenly at his residence in Wrexham on Sunday. Among the railways in North Wales that he constructed were the extensions of the Wrexham, Mold and Connah's Quay line to the Hawarden Bridge over the Dee, and from the Exchange Station into the centre of Wrexham.

MR. JAMES WILKINS, the Bristol builder, died at Clifton on March 28. He erected the Children's Hospital, the Bristol Grammar School, St. Nathaniel's Church, and the additions to Christ Church, Clifton, and removed St. Werburgh's Church from the city and re-erected it on its present site near Mina Road. Mr. Wilkins was in his sixtieth year.

THE Rev. H. E. Hulton has offered 1,000*l.* towards the cost of restoring the ancient church of Little Leighs, Essex.

BUILDING AND BUILDERS.

THE Wesleyan Chapel, St. John's Square, Clerkenwell, is to be enlarged. At the meeting to make arrangements a sum of 3,500*l.* was promised.

A SCHOOL for the deaf and dumb and blind children of North Staffordshire is to be erected at the Mount, Penkull, from plans by Messrs. Scrivener & Sons.

THE Herts County Council have adopted the following resolution:—"That having regard to the requirements of the Government architect and to the economy that will result in the future working of the asylum, as well as in the proportionate cost of construction, it be a recommendation to the County Council that the asylum should, in the first instance, be constructed for the reception of 560 patients instead of 400, at an estimated additional cost of 15,000*l.*"

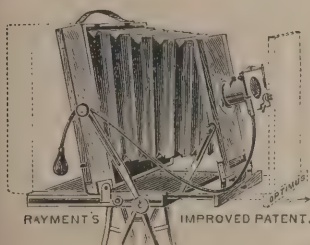
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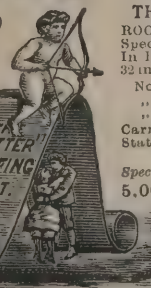


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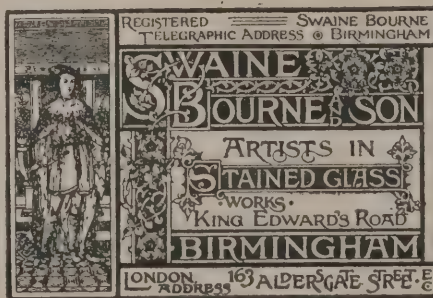
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tion, 1893; Awards
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tions, 1885 and 1886.



THE Boston School Board have secured sites for two schools, which are to be erected without delay.

AN inquiry has been held before Mr. Codrington, C.E., Local Government Board Inspector, in consequence of an application of the Cheshire County Council to borrow 80,000*l.* for the purpose of enlarging the Upton Asylum. Mr. J. L. Grayson, architect, Liverpool, and Mr. Stanhope Bull, the county surveyor, explained the plans. There was no opposition.

AN insanitary area of 77 acres, in Leeds, having 3,684 houses and shops, most of which will be taken down, is to be remodelled by the Corporation at an outlay for clearances of between 300,000*l.* and 400,000*l.*

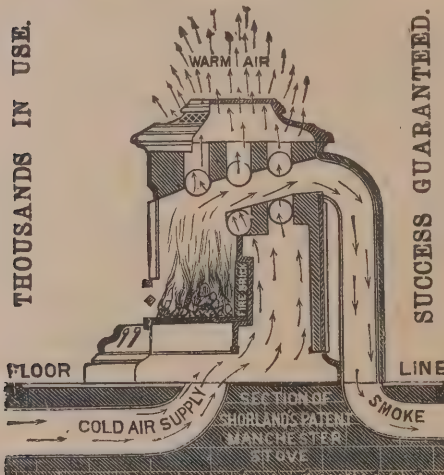
TRADE AND SOCIALISM.

ON Friday, March 29, Mr. John Harrison delivered an address in the Merchants' Hall, Edinburgh, to the members of the Edinburgh Chamber of Commerce and the Edinburgh Merchant Company, on "The dangers to the trade of this country from the spread of Socialism." He began by explaining that, speaking as he did to business men, he would confine himself to the position of antagonism which Socialism took up to business in its widest sense. To both the manufacturer and the merchant Socialism did not say, "You must conduct your business honourably and liberally." What it did say to them was that the day of the manufacturer and the merchant was past, that they must be wiped out and that henceforth the State must be the sole manufacturer and trader. These being the aims of Socialism, it naturally followed that it was forced to attempt to carry out its principles by acquiring political power, and so affecting legislation and changing the whole relations of Government to trade. Socialism, or as it was called to-day, Collectivism, aimed at revolution, not reform. It sought to put an end to individual freedom and individual action. In the words of Mr. Bradlaugh, "It denied private property and affirmed that society, organised as the State, should own all wealth, direct all labour and compel the equal distribution of all produce." Property was theft, and capitalists were thieves, and the State when it took possession of all capital would be carrying out only a great act of justice. They would see that this theory appealed only to the labourer who worked with his hands. It gloried him as the only real worker. It denied all moral worthiness to thrift or to him that created

capital by saving, and necessarily justified the man who consumed all he made. It was easy to show the nonsense of this doctrine, but it was dangerous nonsense if preached, as it regularly was, to masses like those of the East End of London, who had no capital and no likelihood of ever being in a position to acquire it. They had a monthly periodical published in Fountain Bridge, Edinburgh, which stated in its opening number that it "will advocate the public ownership and management of the land, the mines and all the means of production and distribution, such as railways, shipping, factories, workshops, &c.," and the means to attain this result would be by the working classes using their political power. That was an example of Socialist literature, and if they replied that it was stupid stuff, written by irresponsible scribblers, he asked their attention to the proceedings of the last trades congress at Norwich, which professed to speak for more than 1,100,000 of the working men of the country, and the President of which maintained that the only direction in which they could look for the solution of their industrial problems was that of Collectivism. The congress, as a whole, had certainly walked up to the precept of its President, and had reached its "grand climacteric" when it carried a resolution in favour of nationalising "the whole of the means of production, distribution and exchange." He asked them to look with him at this Collectivism, and understand the leading idea on which it was developing its attack on the present order of society. At present we acted on the doctrine of *laissez faire*, the doctrine, namely, that "every man, so long as he does not violate the laws of justice, is left perfectly free to pursue his own interests in his own way, and to bring both his industry and his capital into competition with any other man or order of men." It was a doctrine the application of which had resulted in a marvellous development of commerce, science and civilisation. It was a rule of the survival of the fittest which had led to the development of strong individual character. We bowed before the strife and competition arising out of individual action because we believed it to be the law of life, and the only way in which the world was kept from sinking back into barbarism. But Collectivism intended to put a stop to all individual action, and to this end compulsion was to be used, for the Collectivists were not such fools as to believe that the world as at present constituted could be altered by natural means. And so the disciples of Collectivism were to act as one man in attempting to seize the Government, and thus enforce their new system by Act of Parliament. The Collectivist could not find an

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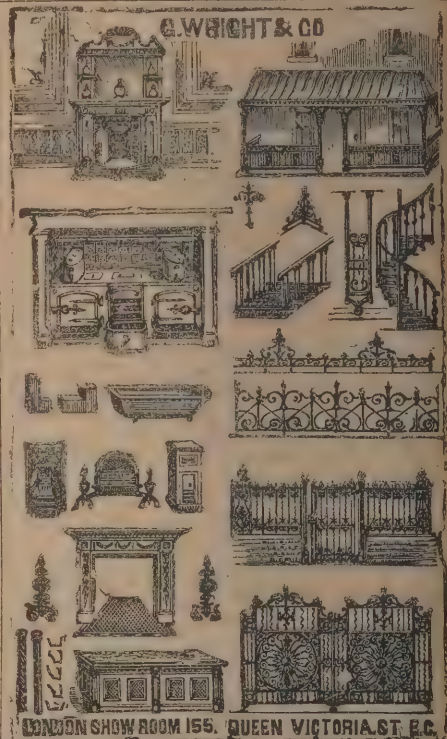
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English word to express his desires and so he borrowed a French one, and talked of the *solidarité* of the working classes, the plain English of which was that the working man was to give up all his individuality for the good of his class. And this *solidarité* once secured was to be kept up by legal compulsion, just as the discipline of the trade union was kept up by class compulsion—moral suasion enforced by bludgeons. Was not, he asked, the great Scottish coal strike an example of this kind of *solidarité*, which nothing but fear of violence kept up so long even as it lasted. Let them also consider the programme of the church militant of Collectivism—the Independent Labour Party—as laid down by Mr. Keir Hardie in the January number of the *Nineteenth Century*; and let them mark how individual action was to be abolished by law and the State was to supervise life and control it. There were seven items in the programme:—(1) Restriction by law of the working day to eight hours; (2) abolition of overtime, piecework and prohibition of child labour; (3) provision for the sick, disabled, aged, widows and orphans, the funds to be obtained by a tax upon unearned incomes; (4) free, unsectarian, primary, secondary and University education; (5) taxation to extinction of unearned incomes; (6) the substitution of arbitration for war and the consequent disarmament of nations. The believers in Collectivism were not, indeed, sufficiently numerous to put their principles into force, but ideas born of Collectivism were working like leaven, disturbing the relations between employers and employed, to the detriment of both; they were affecting legislation, and threatening to affect it even more in the future. Collectivism was straining the relation between the capitalist and his workmen by preaching the doctrine that capital was theft; and during times of strike the workmen were apt to forget prudence and common sense under the fatal counsels of the Socialist agitator. But the ideas born of Collectivism were already most seriously affecting business by the way in which they were influencing legislation, and through the fear which filled men's minds regarding the legislation of the future. Collectivism hoped for the time when the State would interfere in every relation of life. In this country, Socialists were steadily working to gain two ends through legislation—first, to give *solidarité*, as it was styled, to the working classes by legislative enactments regarding hours of labour; and, secondly, to throw on the State a host of duties now performed by men individually or through voluntary association. With regard to the first object, they would notice that all such proposals as those contained in the Eight Hours Bill for miners

were intended once and for all to kill out not only all individual freedom—that every trade union already denied to its members—but all freedom of corporate action to the various trades organisations. The Socialist party consistently rejected all proposals to allow “local option” among trade unions. A striking example was given of this determination of the Socialist leaders for *solidarité* during the discussions in Parliament in November 1893 of an amending Bill on the Employers’ Liability Act. On the Bill being introduced by the Government certain bodies of working men petitioned, through their unions, to be allowed to “contract out,” on the plea that they had with their employers arrangements in existence which gave them superior advantages to those they would gain under the Bill. The parliamentary committee of the Trade Congress raged at their insolence, and under the pressure brought to bear the House of Commons refused to permit “contracting out,” but the House of Lords gave ear to the petition and inserted a clause giving effect to the request. Whereupon the Government withdrew the Bill on the grounds that the measure was rendered distasteful to the trade unions by the permission to contract out. The House of Lords, in fact, went directly in the teeth of that new unionism which was the direct outcome of Collectivism. Nothing was so hateful to the Socialist leaders, because nothing was so detrimental to *solidarité* as independence on the part of working men, and they were specially to be reprobated who raised themselves above their class, or who had special advantages granted to them by employers. Working men under such conditions did not “come to heel” sufficiently abjectly when ordered to do so, and their independence was injurious to the *solidarité* of their class. It was not necessary, surely, to point out how fatal this doctrine which the trade union leaders preached would be to the country. In this country it had been out of the ranks of those who worked with their hands that most of the men had sprung who were the great organisers of labour and the great inventors of machines for the economy of labour. To talk of the capitalist class as if it were a close corporation was nonsense, and pernicious nonsense; the real leaders of the employers in this country at the present time are and always were born in the ranks of the employed; their power came from the intimate knowledge of material they acquired when working at the bench or the loom. The trade of the country would receive a fatal blow if it were not yearly recruited by strong men from the ranks. With regard to the second form of legislative interfer-



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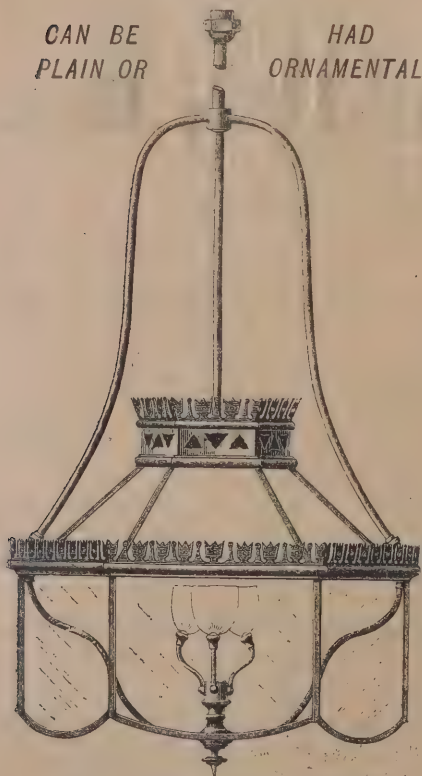
ence, which Socialists at present urged—the throwing on the Government of the country the duty of finding work for the unemployed, of providing for the sick and aged, and of making all education, up to the universities, free—it was not necessary to say much. Each proposal, and every branch of every such proposal, must be discussed on its merits. He would only point out that each act of the Government by which it undertook duties which men could perform for themselves tended to lessen that feeling of independence among the people which was fostered by self-help. The inroad of the State into the province of individual action should be watched with jealous eye. As a sample in a somewhat restricted scale of Collectivism at work, he asked them to consider the actions of the late London County Council. During the last three years the London County Council had been largely controlled by Socialism, and although the Collectivist leaders had not been able to advance very far, they had managed to put at least one of their theories into practice. Their great antipathy was competition and the system of contracts; instead, they proposed that the municipality should conduct its own work in its own workshops, and by means of its own workmen. The London County Council therefore nominated a works committee, which, in the beginning of 1893, took premises in Lambeth for workshops, on which 90,000*l.* were spent. The system pursued was simple, and singularly well fitted for squandering the money of the rate-payers. Say that the committee charged with the fire-engines wished a new station built, instead of advertising for tenders from builders, it applied to the works committee, which furnished an estimate of cost and proceeded with the work. But when the station was completed, and was found to cost 33 per cent. more than the estimate, no one was, of course, to blame, and the poor ratepayer had to "pay the piper." Some of the examples of Collectivist business were very amusing. Hammersmith Bridge required repainting, and in June 1893 the Council empowered the bridges committee to proceed with the work, which the works committee undertook to carry out by means of the corporation workmen for 1,000*l.* The same had been last done for 85*l.*, in 1888, under contract. The accounts for the painting were not presented until January 1895, when they were found to amount to 2,185*l.*—a rise of 150 per cent. on the cost of the work as last carried out. The result was the natural one, seeing that the only persons to be considered were the spenders, and the poor people who had to pay were put out of court

altogether. Another favourite project of the leaders in the County Council was the establishment of municipal bakeries, so that the Council might bake the bread for London, and the ultimate end was the supply of bread by rate, like water, bread and water being the two necessities of life. For this bold project the Council did not live long enough to take even the initial steps. Such were the aims of Socialism, which was exercising a wonderful power over the minds of men. He did not say that the influence of Socialism was altogether for evil, but striking, as it did, at the root of that sense of individuality and moral responsibility, he believed that in the main it was bad. Against the inroads of Collectivism it was their bounden duty as citizens to fight, if they desired the good of the country. But, while he despised the doctrines of Collectivism, he sympathised with the spirit of rebellion against the tremendous inequalities of life, which made Socialists of multitudes who could not understand its doctrines; but in all matters affecting the wealth of nations, the head was a much better guide than the heart, for they could not alter the fundamental principles of human nature, nor the laws which governed the creation and the distribution of wealth. There was a way, however, in which it behoved all who employed working men to combat Socialism—by liberal and honourable and friendly dealing with their workers. It was the old feeling that "wages is no inheritance" which made them Socialists. It was that feeling of rebellion against mere wages which was at the bottom of some of the social unrest. To him it had always seemed wise to recognise that that feeling was just, on the part of those workmen at least who really gave their lives to build up a business. If employers were wise, they had to discover some method of satisfying the working man's desire for some recognition of his real partnership in the concern. Some plan of profit-sharing, or perhaps of commission out of profits for length of service, which in many businesses would not be difficult to put in practice, would take away the ground from below the Collectivist agitators. In concluding, Mr. Harrison said that much as he appreciated the tremendous forces which were working to bring about some social experiment, he denied the likelihood of taking permanent hold on the masses of the country. Its principle was compulsion, and the people of this country had been freemen ever. But Collectivism would bring into being a tyranny to which trades unionism was mild, for the State would be "universal boss," and against the State officials there would be no appeal. Individual action, individual rights, individual conscience

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would be utterly suppressed, and blank uniformity would reign supreme. A great Scottish economist had stated with great clearness how completely the adoption of Collectivism would be fatal to all freedom:—"The real opposite of competition or liberty is compulsion or slavery, the authoritative assignment to each man of the work which he has to do. This is what genuine Socialism, what Collectivism proffers us. It means robbing man of his true self, of what gives to his soul and conduct dignity and worth."

STEAM-ENGINE ECONOMY.

At the ordinary meeting of the Institution of Civil Engineers, on March 19, 1895, the paper read was on "Steam-Engine Economy: Condensing Engines," by Mr. Henry Davey. It was said that the principles upon which the development of the steam-engine as regards economy of steam were founded had been understood in the time of James Watt, who had shown that gain might be expected to result from increased expansion, and had also explained that in order to obtain the full benefit of expansion the steam-cylinder must be maintained at a high temperature. Trevithick, Sims, Grose and others had perceived that increased expansion, and consequently increased economy, might result from the employment of higher pressures. As early as 1844 the Cornish engine had been, for the steam-pressure then practicable, a more efficient engine than any other subsequently produced. Some Cornish engines at that time produced 1 indicated horse-power per hour for a consumption of 19 lbs. of steam at a boiler pressure of 30 lbs. per square inch. Their efficiency was thus greater than that of modern triple-expansion engines giving 1 indicated horse-power per hour with 13 lbs. of steam at a pressure of 120 lbs. per square inch in the boiler. The triple-expansion engine was more economical because it was worked at a higher pressure and at a higher rate of expansion; but it did not utilise the pressure and expansion so efficiently as the Cornish engine had done. A period of sixty-seven years had been required for the development of the principles enumerated by Watt, Trevithick and Grose; and upwards of forty years for the reduction of the consumption of steam from 19 lbs. to 13 lbs. per indicated horse-power per hour, or, in other words, for the diminution of the coal bill by one-third. In these advances no new principle had been applied and no higher efficiency obtained.

The author had collected many examples of steam-engine trials in which the mean indicator-diagrams were available, and the total feed-water per indicated horse-power per hour was known. These he had submitted to analysis to localise the losses. The mean indicator-card of a given trial having been selected, a saturation-curve was delineated to represent an assumed standard for a jacketed engine, working with the steam-engine cycle, and with no losses. This figure having been completed, the losses which make up the difference between the actual and the standard diagram could be readily separated, and their relative importance ascertained. The "engine efficiency" was expressed as the ratio between the mean pressure of the indicator figure and that of the standard engine diagram. The diagrams being drawn to a scale convenient for the use of the planimeter, the area of the waste spaces could be measured and expressed as a percentage of the full area of the diagram. These waste spaces represented cylinder condensation, &c., including condensation in the jacket, clearances, compression influences being taken into account when they were considerable, and back-pressure. Having submitted a considerable number of examples of different types of engines to this method of analysis, the author showed that the economy of steam obtained by modern engines was simply due to increased pressure and increased expansion, and that the engine efficiency or the percentage of work obtained from steam of a given pressure and given rate of expansion, referred to the standard selected, was lower in modern engines than in the Cornish engine thirty or forty years ago. It was also seen that the loss in power arising simply from the cooling influence of the cylinder-walls was not, in jacketed engines at all events, so serious as was sometimes supposed. It was stated that the method gave practical results, and enabled defects in the steam distribution to be readily ascertained; also, that the engine efficiency obtainable from a given steam-distribution afforded a proper gauge of the value of that mode of distribution in point of possible economy. The average engine efficiencies, ratios of expansion and initial pressures for the examples given were:—

	Engine efficiency.	Lbs. of steam per I.H.P. per hour.	Rates of expansion	Initial pressure.
Cornish	73.0	21.0	3.65	33
Single cylinder	66.0	23.5	3.95	76
Compound	64.0	18.5	7.73	84
Triple-expansion	64.4	14.8	14.5	138

The best results in individual cases, fully detailed in appendices to the paper, were much higher.

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Wrought-Iron Work, Stained Cathedral Glass, and any other Interior Work.

ECONOMY IN LIGHTING.

A MEETING of the Manchester Association of Engineers was held on Saturday, when a paper on "The economical lighting of public and private buildings, workshops, &c.," was read by Mr. John West, ex-president of the Gas Institute. As the hotel is lighted with electricity the present meeting was held in one of the large rooms of the Central Board School, Deansgate, in order that the paper might be illustrated by experiments. There the Welsbach incandescent gas-burner, regenerator burners, argand and other burners were shown in operation, and remarkable illustrations were given of what is possible in the way of securing a brilliant gas-light. It was explained that the gas supplied throughout the United Kingdom varied in illuminating power from 12 to 28 candles. In many English provincial towns it ranged from 12 to 15 candles; in London it was 16 candles; in Manchester and other places near the canal fields it ranged from 15 to 20 candles; and in Scotland it ranged as high as 28 candles. But in far too many cases the consumer did not get full advantage of the lighting power of the gas. About thirteen years ago Mr. West obtained a large number of the burners in ordinary use in Manchester, and found that the loss of illuminating power by their use came in most cases to over 30 per cent. He feared, from observations he had since made, that that loss was still going on. The best kinds of the ordinary burners were to be had cheap, and in order that there might not be undue pressure of the gas as it issued from the burner, resulting in imperfect combustion and consequent waste of light, he recommended that in private houses a regulator should be attached to each burner, or that what are known as governor burners should be used. For lighting public and private buildings and workshops he strongly recommended the incandescent gas-burner, which, he stated, he was using at his own works, with the result that he obtained at half the former cost four times more light. Alike in public and private buildings, where general lighting was desired, he recommended that the chandelier or pendant should be placed in the centre of the building or room, as where brackets were used the walls absorbed a great quantity of the light. Comparing the cost of incandescent electric-lighting with the cost of incandescent gas-lighting, he stated that a 16-candle incandescent electric lamp in use 1,000 hours would absorb 60 units of electricity, which, at 6d. per Board of Trade unit, would come to 30s., whereas an incandescent gas-burner consuming 3 cubic feet of

gas per hour, or 3,000 cubic feet in 1,000 hours, and giving a light equal to that of 60 candles, or fully three times that of the electric light, would cost, with gas at Manchester at 2s. 3d. per 1,000 cubic feet, 6s. 9d.; at Maidstone, with gas at 2s. 4d. per 1,000, 7s.; and at Plymouth, with gas at 1s. 9d. per 1,000, 5s. 3d. He challenged the electricians to disprove those figures.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

5619. James Corp, for "Improvements in and relating to sliding windows."
 5622. Edward Vernon Harris, for "Improvements in window-sashes."
 5634. William Whiteley, jun., for "Improvements in fastenings for doors, windows and the like."
 5706. John McFeat, for "Improvements in apparatus for controlling the supply of hot and cold water to baths, lavatories and the like."
 5751. August Lübke and William Joseph Keating, for "Improvements in locks for sliding doors."
 5774. James Corp, for "Improvements relating to window-frames."
 5817. Thomas Whitehead, for "Improvements in extracting ventilators or chimney-tops."
 5820. William James Simmons, for "Improvements in sashes."
 5837. Bryan Edward Hodgson, for "A new or improved window-fastener."
 5981. Samuel Naylor, for "Improvements in and in connection with hot-water apparatus for houses."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & Co., Patent Agents, 37 Chancery Lane, London, W.C.

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SPECIAL NOTICE TO THE TRADE AND OTHERS.

[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

TENDERS, ETC.

*** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.*

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COMPETITIONS OPEN.

BRIGG.—April 19.—Designs are invited for Scheme for Sewerage and Sewage Disposal. Mr. G. S. Sowter, Urban District Council Offices, Brigg, Lincolnshire.

KIRKCALDY.—May 1.—Plans are invited for proposed Infectious Diseases Hospital. Town Clerk, Kirkcaldy.

LLANELLY.—May 15.—Elevations and Plans are invited for proposed School. Mr. Fred. Nelson Powell, Clerk to the Managers of the Llanelly Intermediate and Technical Schools, Llanelly.

CONTRACTS OPEN.

ABERTILLERY.—April 15.—For Building Schools. Mr. Geo. Rosser, Architect, Victoria Buildings, Abercarn.

BELPER.—April 20.—For Alterations and Additions to Lock-up. Mr. J. S. Storey, County Surveyor, Market Place, Derby.

BILSTON.—April 16.—For the Reconstruction of Baths. Mr. Wilson, C.E., Town Hall, Bilston.

BRAINTREE.—April 18.—For Erection of Casual Wards, Board and Committee Rooms, &c. Mr. Frank Whitmore, Chelmsford.

BUILTH.—April 24.—For Constructing Reservoir, Filter-bed, &c. Mr. R. L. Bamford, Widemarsh Street, Hereford.

CAMBRIDGE.—April 23.—For the Supply of Manhole and Ventilator Covers, Valves and Other Castings for Main Sewerage Works. Mr. John T. Wood, A.M.I.C.E., 3 Cook Street, Liverpool.

CAVERSHAM.—April 19.—For the Construction of Sewerage Works. Mr. Nicholson Lailey, F.G.S., 18 Great George Street, S.W.

CHELSEA.—April 23.—For Painting Outside Workhouse. Messrs. Lansdell & Harrison, 12 Compton Terrace, N.

CITY OF LONDON.—April 30.—For the Construction of Underground Conveniences in Circus Place, Finsbury, and Cannon Street. Mr. H. Montague Bates, Tenders Office, Guildhall.

DARENTH.—April 17.—For the Erection of a Board School for 220 Children, with Boundary Wall or Fence. Mr. W. J. Judge, Horn's Cross Stone, Greenhithe, Kent.

DINGWALL.—April 22.—For Repairing Roads. Mr. A. G. Joass, Surveyor, Dingwall, N.B.

DUBLIN.—April 15.—For Building Railway-station Offices, Waiting-rooms, &c. Mr. W. H. Mills, Amiens Street Terminus, Dublin.

GOSFORTH.—April 23.—For Extending Asylum. Mr. John W. Dyson, Architect, 18 Grainger Street, Newcastle-on-Tyne.

GREAT YARMOUTH.—April 12.—For Building Water Tower. Mr. D. Palmer, 38 Hall Quay, Great Yarmouth.

HENDON.—April 22.—For Excavating, Forming, Levelling, Metalling, Kerbing, Channelling, Tar-paving, Construction of Gullies, &c. Mr. S. S. Grinsley, The Burroughs, Hendon.

KETTERING.—April 22.—For Constructing Service Reservoir. Mr. T. Hennell, 6 Delahay Street, Westminster.

LEEDS.—April 13.—For Supplying and Erecting Six Purifiers. Mr. R. Smith, New Wortley Gasworks, Leeds.

LITTLE LOCH CRAIGNISH.—April 16.—For Constructing Pier. Mr. G. Woulfe Brennan, Engineer, Oban.

LONDON.—April 17.—For Supplying Aberdeen Granite Cubes. Mr. W. H. Atkins, Board of Works Office, Bank-side, S.E.

LONDON.—April 23.—For Erection of a Timber Shelter in Clissold Park and Two in North Woolwich Gardens. Mr. H. De la Hooke, London County Council, Spring Gardens.

LURGAN.—April 18.—For Building Business Premises. Mr. Henry Hobart, Architect, Dromore, Co. Down.

MANCHESTER.—April 15.—For the Supply of 500 Tons of Bessemer Steel Tram Rails, Fishplates, &c. Mr. William Henry Talbot, Town Hall, Manchester.

MANCHESTER.—April 18.—For Alterations and Additions to Horse Hospital. The Engineer, Manchester, Sheffield and Lincolnshire Railway Company, London Road Station, Manchester.

MERTHYR TYDFIL.—April 18.—For Building Thirty-two Houses. Mr. John Williams, Architect, Morgan Town, Merthyr Tydfil.

MIRFIELD.—April 19.—For Building Two Detached Houses and Eight Cottages. Mr. Reuben Castle, Architect, Westgate, Cleckheaton.

MORLEY.—April 13.—For Building School. Messrs. Holtom & Fox, Architects, Dewsbury.

MORLEY.—April 13.—For Pulling-down and Rebuilding Three Houses and Shops. Mr. T. A. Buttery, Architect, Queen Street, Morley, Yorks.

NEWCASTLE-ON-TYNE.—April 23.—For the Erection of the Superstructure of the Extension of the City Asylum. Mr. John W. Dyson, 18 Granger Street, Newcastle-on-Tyne.

PENRITH.—April 15.—For Constructing Waterworks. Mr. C. N. Arnison, Rural District Council Offices, St. Andrew's Place, Penrith.

PORTSMOUTH.—April 17.—For Making Roads. Mr. A. Hellard, Town Hall, Portsmouth.

ROCHESTER.—April 17.—For Making up Roads. Mr. William Banks, Guildhall, Rochester.

ROTHERHITHE.—April 20.—For the Erection of Staff Quarters. Mr. T. W. Aldwinckle, 1 Victoria Street, S.W.

RUABON.—April 12.—For Building Court-house. Mr. R. Lloyd Williams, County Surveyor, Denbigh.

SENGHEWTH.—April 13.—For Building Hotel. Mr. E. H. Burton, Architect, 15 Queen Street, Cardiff.

SOUTHGATE.—April 19.—For the Supply and Delivery of 1,500 Tons (more or less) of Hand-broken Granite, the carting thereof from the railway stations to various points in the district, Glazed Fireclay Pipes, Pipes with Special Watertight Joints, Portland Cement, Iron Castings, &c. Mr. W. M. Ellenor, Council Offices, Palmer's Green, N.

SOUTHWARK.—April 17.—For the Supply of 300 Tons Aberdeen Granite Cubes and 36,000 Jarrah Wood Blocks. Mr. W. H. Aikens, Board of Works Office, Emerson Street, S.E.

STEEPLE CLAYDON.—April 23.—For Building Schools, &c. Messrs. George Bennett & Sons, Surveyors, Buckingham.

STOCKPORT.—April 22.—For Constructing Brick Sewers, Cast-iron Culverts, &c. Mr. A. M. Fowler, 1 St. Peter's Square, Manchester.

THORNHILL.—April 16.—For Constructing Pipe Sewer. Mr. James C. Haller, Council Offices, Thornhill, Yorks.

TUNBRIDGE WELLS.—April 26.—For the Erection of a Post Office. Messrs. Lee & Sons, 35 Craven Street, W.C.

WARRINGTON.—April 15.—For Supplying Granite Cubes, Chequered Tiles and Blue Bricks. Mr. T. Longdin, Town Hall, Warrington.

WELLINGBOROUGH.—April 16.—For Supplying Granite. Mr. Willan Jackson, Workhouse, Wellingborough.

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WIMBLEDON.—April 23.—For the Erection of a Caretaker's Cottage. Mr. W. H. Whitfield, Broadway, Wimbledon.

TENDERS.

ABER.

For Building Four Shops and Dwelling-houses at Aber. Mr. CHARLES TAYLOR, Architect, 22 Duke Street, Cardiff.

D. C. Jones & Co., Gloucester	£2,189	0	0
Knox & Wells, Cardiff	2,156	0	0
J. C. Richards, Pontypridd	2,060	0	0
Cox & Bardo, Cardiff	2,051	0	0
D. Davies, Cardiff	2,035	0	0
T. Rossiter, Caerphilly	1,965	10	0
J. Thomas, Cardiff	1,834	0	0
Griffiths & Co. Pontypridd	1,674	15	11
T. Evans, Cardiff	1,558	0	0

ABERDEEN.

For New Underground Convenience, Castle Street, for the Town Council. Mr. GEO. T. LYNAM, Assistant Borough Surveyor.

Accepted Tenders.

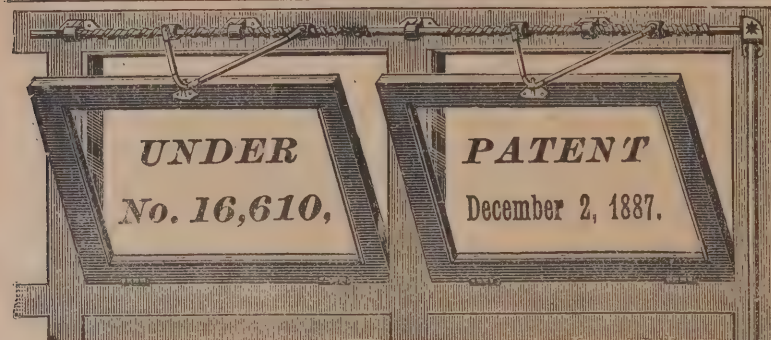
C. Gordon, mason	£684	6	0
J. Bannochie & Sons, plasterer	315	7	6
Reid & Porter, plumber	215	0	0
Leslie & Haig, carpenter	61	0	0

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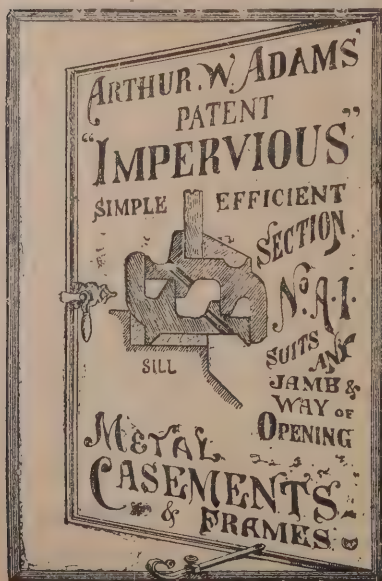
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Bartlett Bros., Witney	£2,425	0	0
Orchard & Son, Banbury	2,239	0	0
Goodchild, Reading	2,185	0	0
Wernham, Reading	2,100	0	0
Robinson, Wolvercote	2,063	0	0
Martin, Maidenhead	2,050	0	0
Buckle, Abingdon	2,035	0	0
GRANT, Banbury (accepted)	1,849	0	0
Wheeler, Abingdon	1,700	0	0

* Mr. Wheeler attached a condition in submitting his Tender.



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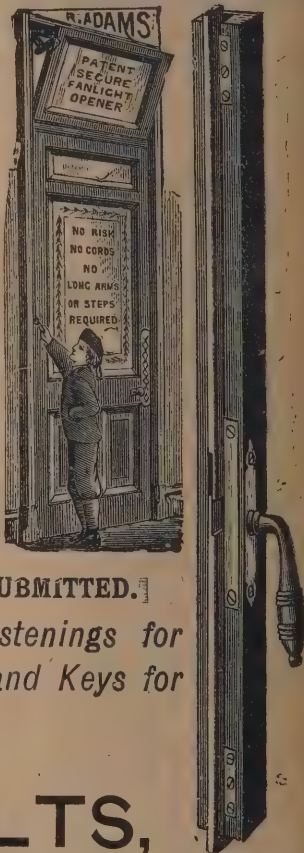
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Carter & Sons, Accrington, glazier and plumber	424	0	0
Evans & Co., Accrington, slater	97	5	0
J. W. Douthwaite, Accrington, plasterer	70	9	0
A. Wilson, Accrington, painter	52	18	9

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For Pair of Villa Residences, Richmond Street, for Mr. J. Farrow. Messrs. GEORGE & SON, Architects, Old Square, Ashton-under-Lyne. Quantities by the Architects.

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J. Gibson & Son, Dukinfield, bricklayer and excavator	£575	0	0
E. Kirkley, Ashton-under-Lyne, joiner	310	0	0
Garside, Barnes & Co., Stalybridge, mason	149	0	0
J. H. Coop, Ashton-under-Lyne, plumber and glazier	117	7	6
W. Mellor, Dukinfield, plasterer	69	0	0
R. Newton, Symondley, slater	57	0	0
T. Catlow, Ashton-under-Lyne, painter	17	10	0

BAKEWELL.

For Building Lady Manners School, Bakewell. Mr. E. MOREWOOD LONGSDON, Architect, Town Hall, Bakewell.

Mason, Slater and Plasterer.

W. & G. Toft, Youlgreave, Bakewell	£1,388	0	0
J. Bramwell, Bakewell	1,365	0	0
W. Knowles & Sons, Matlock	1,355	0	0
J. Vains, Darley Dale, Matlock	1,340	0	0
T. ALLSOP, Bakewell (accepted)	1,249	0	0

Joiner, Plumber and Painter.

C. F. GROOM, Bakewell (accepted)	634	0	0
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W. Walker, Wirksworth	2,094	0	0
W. L. T. Wildgoose, Matlock	1,970	0	0

BIRMINGHAM.

For Fencing St. Paul's Churchyard. HILL & SMITH, Dudley (accepted)800 0 0

BROTHERTON.

For New Schools, Master's House, &c., at Brotherton, for the Brotherton School Board. Mr. J. H. GREAVES, Architect, 38 Albion Street, Leeds.

G. Spur, Pontefract, excavator, bricklayer and mason	£1,200	0	0
Bakker & Jowitt, Pontefract, carpenter and joiner	674	12	0
G. Garbutt, Normanton, slater	161	5	2
J. Powell, South Milford, plumber and glazier	150	0	0
F. H. Marsden, Knottingley, plasterer	125	0	0
J. Powell, painter	45	0	0
Architect's estimate	2,350	0	0

BURTON-ON-TRENT.

For Alterations to the Chancel of Rangemore Church, Burton-on-Trent, for the Right Hon. Lord Burton. Messrs. NORTHCROFT, SON & NEIGHBOUR, Architects. Quantities by Messrs. G. F. BODLEY, A.R.A., and T. GARNER.

G. F. Smith & Sons	£2,670	0	0
Stephens, Bastow & Co., Limited	2,399	0	0
H. R. Franklin	2,226	0	0
RUDD & SON (accepted)	2,135	0	0

COGENHOE.

For Erection of Schools at Cogenhoe, for the Cogenhoe School Board. Mr. H. H. DYER, Architect, 1 Sheep Street, Northampton.

G. W. Souster, Northampton	£1,517	5	0
C. W. Abbott, Wellingborough	1,465	6	0
G. T. Fisher, Northampton	1,444	0	0
W. S. Sturgess & Son, Roade	1,399	0	0
H. Martin, Northampton	1,389	0	0
G. Branson & Son, Northampton	1,355	0	0
M. Clayton, Cogenhoe	1,350	0	0
E. D. Sharman, Semilong	1,320	0	0
A. P. Hawtin, Northampton	1,300	0	0
W. Throssel, Northampton	1,280	0	0
Wilford & Judkin, Northampton	1,252	0	0
F. Johnson & Son, Earl's Barton	1,247	0	0
W. T. Whitbread, Northampton	1,234	10	0
J. M. Parting, Northampton	1,234	10	0
N. Adams, Northampton	1,230	0	0
J. C. SHARMAN, Cogenhoe	1,174	15	0

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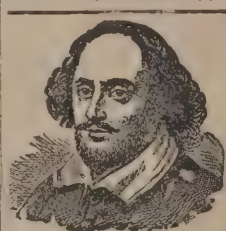
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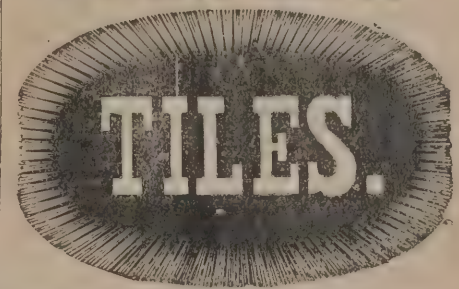
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CRAMLINGTON.

For Erection of a New Bakery, for the Cramlington Co-operative Society. Mr. J. G. CRONE, Architect, 50 Grainger Street, Newcastle.

Barrett & Co., Gateshead-on-Tyne	£785	0	0
A. Gray, Jun., Wideopen	743	13	0
D. Spence, Amble	743	0	0
C. Pattinson, Dudley	734	10	0
DIXON & SIMMONS, Cramlington (accepted)	697	1	0

CROSS.

For Alterations to The Cedars, Cross, near Axbridge. Mr. S. J. WILDE, Architect, Weston-super-Mare.

W. U. Dubin, Weston-super-Mare	£425	0	0
J. Ford & Sons, Cheddar, Somerset	283	0	0
LOVELL & SONS, Bristol (accepted)	229	0	0

DALMELLINGTON.

For Carrying-out Drainage Works.

Pearson, Kilmarnock	£1,300	0	0
G. Gibson, Dalmellington	1,285	15	1
A. GIBSON, Dalmellington (accepted)	1,285	11	5

DARTFORD.

For Laying Artificial Stone Paving, for the Urban District Council. Mr. W. HARSTON, Surveyor, High Street, Dartford.

Patent Victoria Stone Co.	£157	10	0
Imperial Stone Co.	136	4	0
J. Mowlem & Co.	131	4	3
Stuart's Granolithic Paving Co.	128	12	4
Jones's Annealed Concrete Co.	120	0	0
Patent Indurated Stone Co.	119	0	0
A. J. PHILLIPS & Co. (accepted)	114	7	6
Wilkinson & Co., Limited (paving only)	84	0	0

EDGWARE.

For Repairs to Bald Faced Stag, for Messrs. A. & C. Marshall, Edgware, Middlesex. Mr. GEORGE HORNBLOWER, A.R.I.B.A., Architect, 20 Fitzroy Street, W.

J. ALLEN & SONS (accepted)	153	10	0
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GODALMING.

For Cemetery Chapels and Lodge and other Works upon Land at Eashing Lane, Godalming, for the Godalming Burial Board. Messrs. WELMAN & STREET, Architects, Church Street, Godalming.

W. Smith, Farnborough	£3,150	0	0
Mitchell Bros., Guildford	3,147	0	0
T. F. Hall, Godalming	3,140	0	0
T. Kingerlee, Oxford	2,867	0	0
F. Milton, Witley	2,796	0	0
Peters & Son, Horsham	2,735	0	0
G. Horn, Godalming	2,644	0	0
HARRIS & SON, Woking (accepted)	2,625	0	0

GODSTONE.

For Contract A—Division I.: Pipe Sewers, Manholes, &c.; Division II.: Settling-tanks and Laying-out Filtration Area at Bletchingly, for the Godstone Rural District Council.

T. Adams, Wood Green, London	£1,798	10	9
J. Jackson, The Laurels, Plaistow	1,592	12	9
R. R. Facey, Wild Oak, Taunton	1,472	3	2
P. Peters, Horsham	1,438	4	8
E. Steer, East Grinstead	1,401	17	0
J. R. Hunt	1,351	0	0
G. Osenton, Westerham	1,209	18	2
W. Cunliffe, Cromwell Road, Kingston-on-Thames	1,103	0	0
T. BELL, Market Weighton (accepted)	1,040	7	4

GREYWELL.

For Erection of New Board School at Greywell, near Odiham, for the Greywell School Board. Mr. J. ALFRED EGGAR, Architect. Quantities by Architect.

E. Hellis, Odiham	£1,550	0	0
Poole & Son, Hartley Wintney	1,450	0	0
McC. E. Fitt, Reading	1,387	0	0
J. Kemp, Froyle	1,341	16	4
Liming Bros., Crookham	1,300	0	0
Musselwhite & Son, Basingstoke	1,295	0	0
Jenkins & Sons, Bournemouth	1,266	0	0
J. Cooper, Odiham	1,250	0	0
W. J. Chinchin, Bournemouth	1,200	0	0
J. Sims, Basingstoke	1,195	13	0
J. THUMWOOD, Basingstoke (accepted)	1,159	11	6

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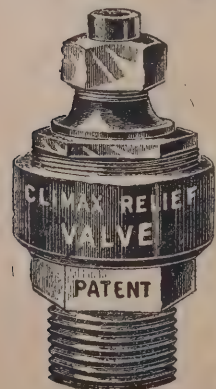
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GREENWICH.

For Works, Conington Road, Greenwich. Mr. T. DINWIDDY, F.S.I., Surveyor.
 Wood £608 0 0
 W. MILLS (*accepted*) 540 0 0

HALIFAX.

For Addition to Warehouse at Small Street Mills, for Messrs. Hollingrake & Clegg, Limited. Mr. ARTHUR G. DALZELL, Architect and Surveyor, Albany Chambers, 15 Commercial Street, Halifax.

Accepted Tenders.

H. Jenkinson, mason £121 10 0
 J. Halliday, joiner 85 0 0
 Rushworth & Firth, slater 33 10 0
 G. Priestley, plumber 21 6 0
 J. Berry, ironfounder 18 15 6
 Total £280 1 6

HARROGATE.

For Erection of School Building at Smithy Hill, for the Harrogate School Board. Mr. T. EDWARD MARSHALL, Architect, Princess Street, Harrogate.

Accepted Tenders.

M. Wilson, Leeds, excavator, mason and brickwork £8,200 0 0
 J. Deacon, Shipley, joiner 2,714 0 0
 J. Cook, Huddersfield, concrete 835 0 0
 T. Barraud, Leeds, plumber 799 0 0
 Rushworth, Harrogate, ironwork 558 2 0
 Blackburn & Davenport, slater 422 0 0
 Blackburn & Davenport, Halifax, plasterer 301 0 0
 J. Cook, asphalte 202 17 0
 H. E. Hutton, Shipley, painter 160 0 0

For Building Four Villas at York Place, Harrogate. Mr. W. H. BEAVERS, Architect, 25 Bond Street, Leeds.

Accepted Tenders.

Rhodes Bros., Shipley, mason, bricklayer, joiner and slater £3,861 0 0
 J. W. Moody, Shipley, plasterer and concreter 477 0 0
 G. Thompson, Leeds, plumber 385 0 0

HASTINGS.

For Underground Convenience near the Lifeboat-house, Hastings, for the Corporation. Mr. P. H. PALMER, Borough Engineer.

J. & P. Phillips, Hastings £604 10 0
 J. Geary, St. Leonards 544 0 0
 A. H. White, St. Leonards 519 0 0
 D. H. SNOW, Ore (*accepted*) 500 0 0

For Construction of Brick Main Sewer from Sewage-tank at Rock-a-Nore to the Bourne, Hastings. Mr. P. H. PALMER, Borough Engineer.

H. Roberts, West Bromwich £3,825 0 0
 G. Osenton, Westerham 3,779 0 0
 T. Adams, London 3,458 0 0
 H. Hill, Maidenhead 3,362 13 6
 A. Kellett, London 2,861 0 0
 Wilkinson Bros., London 2,800 0 0
 P. Jenkins, Hastings 2,790 0 0
 G. BELL, Tottenham Hale, London (*accepted*) 2,780 0 0

For Construction of Pipe Sewers, Man Shafts, Flushing Shafts, &c, in the Clive Vale District of Hastings. Mr. P. H. PALMER, Borough Engineer.

Wilkinson Bros., London £7,900 0 0
 Jenkins & Sons, Bournemouth 7,839 0 0
 H. Hill, Maidenhead 7,669 10 11
 P. Jenkins, Hastings 7,578 0 0
 T. Adam, London 7,557 0 0
 G. Osenton, Westerton 7,221 0 0
 A. Kellett, London 7,100 0 0
 W. H. Saunders, Bournemouth 6,490 0 0
 J. & P. Phillips, Hastings 6,090 0 0
 H. Roberts, West Bromwich 6,000 0 0
 G. Bell, London 5,890 0 0
 A. KING, Hollington (*accepted*) 5,500 0 0

HENDON.

For Verandah, Bay Window, &c, St. Swithins, Hendon, Middlesex, for Mr. W. R. Bousfield, Q.C., M.P. Mr. GEORGE HORNBLLOWER, A.R.I.B.A., Architect, 20 Fitzroy Street, W.

WILLIAM TONT (*accepted*) £330 0 0

For Repairs and Alterations to No. 6 Brent Villas (Cather Estate), Hendon, Middlesex. Mr. GEORGE HORNBLLOWER, A.R.I.B.A., Architect, 20 Fitzroy Street, W.

WILLIAM TONT (*accepted*) £203 17 3

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For New Roofing and Repairing a Block of Buildings containing Six Cottages, at Hanbury Wood End, Staffs, for the Trustees of the Orphans' Protection Lodge.

C. H. Cope, Rugeley	£280	17	8
Forbes & Chadwick, Burton-on-Trent	217	17	0
T. Dickenson, Burton-on-Trent	210	0	0
J. & J. W. Selby, Burton-on-Trent	198	0	0
J. H. Vernon, Burton-on-Trent	184	10	0

HUDDERSFIELD.

For Enlarging St. Andrew's Vicarage. Mr. W. WATSON, Architect, Wakefield.

M. BROOK (accepted)	£349	10	0
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LONDON.

For Internal Finishings, Panellings, &c., to No. 22 Old Queen Street, Westminster, for Mr. Leo Schuster. Mr. A. WILLIAM WEST, Architect, 44B Maddox Street, W. Quantities by Messrs. DUCK & BOUSFIELD, Billiter Square Buildings, E.C.

Turner, Lord & Co.	£1,411	7	6
Litchfield	1,154	14	7
Holland & Hannen	1,090	0	0

MADRON.

For Renovating, Alterations at and Additions to the Bible Christian Chapel Building, at Heamoor, Madron. Mr. J. WM. TROUNSON, Architect, 27 Clarence Street, Penzance.

J. Legg, Madron, Penzance	£249	10	0
J. Oliver, Gwinear, Hayle	228	0	0
J. Duston, Penzance	224	0	0
James & Nicholls, Penzance	217	0	0
Lavers & Roberts, Penzance	213	0	0

NEW DEER.

For Building Shop at New Deer, for Messrs. James Mackie & Co., Limited. Mr. JAMES DUNCAN, Architect, Turriff.

Milne & Crichton, New Deer, mason	£279	10	0
A. Murison, New Deer, carpenter	210	0	0
J. E. Pirie, Fyvie, slater	36	0	0
A. Craig, New Pittsligo, plasterer.	12	10	0
C. Duthie, Turriff, plumber.	14	10	0
J. D. Watson, Turriff, painter	7	10	0

NEWTOWN.

For New Factory, Newtown, Montgomeryshire, for Messrs. Pryce Jones, Limited (Contract No. 1). Mr. GEORGE HORNBLLOWER, A.R.I.B.A., Architect, 20 Fitzroy Street, W. Quantities by Architect.

Foster & Dicksee	£10,750	0	0
Treasure & Son	9,173	0	0
Aaron Watkin	8,847	19	10
E. DAVIES & SON (accepted)	8,750	0	0

NORMANTON.

For Enlarging the Normanton Common Board Schools. Mr. WILLIAM WATSON, Architect, Barstow Square, Wakefield.

J. BRAMHAM (accepted)	£654	10	0
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PONTYPRIDD.

For Building Chapel at Pontypridd, for the Wesleyan Trustees. Mr. ARTHUR O. EVANS, Architect, Pontypridd.

C. Cope, Tunstall	£6,226	0	0
Perkins, Parsons & Co., Cardiff	5,986	0	0
E. Williams, Pontypridd	5,945	0	0
W. Williams, Pontypridd	5,866	0	0
M. Julian, Pontypridd	5,744	0	0
D. C. Jones & Co., Gloucester	5,677	0	0
Williams & James, Pontypridd	5,599	3	9
A. J. Colbourne, Caerphilly	5,529	19	10
KNOX & WELLS, Cardiff (accepted)	5,189	0	0

SALISBURY.

For Steam Flour Mill, &c., at Waterloo, Salisbury, for Mr. H. J. Sutton, Wylie, Wilts. Mr. ALFRED C. BOTHAMS, Architect, 39 Castle Street, Salisbury. Quantities by the Architect.

Young, Salisbury	£1,967	0	0
Witt, Salisbury	1,920	0	0
Webb & Co., Salisbury	1,910	0	0
E. Hale, Salisbury	1,880	0	0
G. Harris, Salisbury	1,875	0	0
Vincent & Folland, Salisbury	1,809	0	0
Hayes, Bristol	1,749	0	0
Kellow & Smith, Salisbury	1,745	0	0
Wort & Way, Salisbury	1,705	0	0
H. J. KITE, Salisbury (accepted)	1,670	0	0

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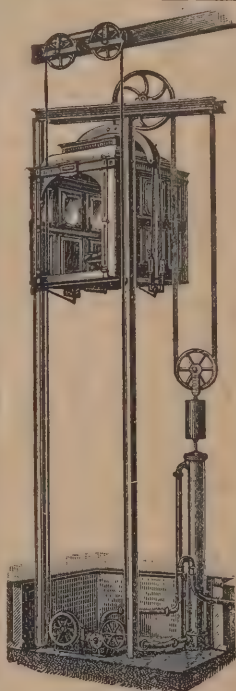
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W. C. Shaddock, Plymouth	£10,915	0	0
T. Shaddock, Plymouth	10,535	0	0
E. Duke, Plymouth	7,686	0	0
W. H. Perry, Exmouth	7,283	0	0
R. Toy, St. Ives	7,129	0	0
J. Shaddock, Plymouth	7,123	0	0
W. S. Thomas & Sons, Crowan	6,503	0	0
T. LANG & SONS, Liskeard (accepted)	6,026	0	0

TIBSHELF.

For Construction of Stoneware and Cast-iron Pipe Sewers and Sewage Purification Works in the Parish of Tibshelf, County Derby, for the Blackwell Rural District Council. Mr. HERBERT WALKER, A.M.I.C.E., Architect, Newcastle Chambers, Nottingham.

T. Smart, Nottingham	£2,220	0	0
J. Tomlinson, Derby	2,185	0	0
H. Vickers, Nottingham	2,174	0	0
J. H. Vickers, Nottingham	2,085	0	0
J. Lane, Stanley, near Mansfield	2,020	0	0
J. T. Price, Nottingham	1,950	0	0
H. Weldon, Birmingham	1,910	4	0
J. Holmes, Clay Cross, Chesterfield	1,909	15	5

WALLINGFORD.

For Stables and Entrance-gate (exclusive of Stable Fittings, Pavings, Drainage, &c.), Wallingford, Berkshire, for Mr. F. Sweetland. Mr. GEORGE HORNBLOWER, A.R.I.B.A., Architect, 20 Fitzroy Street, W. BRASHER & SONS (accepted) £737 9 0

WEST HAM.

For St. Matthew's Church and Parochial Hall, St. Matthew's Park, West Ham, for the Rev. R. Arnold Pelly. Mr. E. P. LOFTUS BROCK, F.S.A., Architect.

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F. G. Minter	4,000	0 0
W. Watson	4,000	0 0
S. J. Scott	3,917	0 0
J. Smith & Son	3,860	0 0
S. G. Parmenter	3,814	0 0
C. North (withdrawn)	3,550	0 0

VARIETIES.

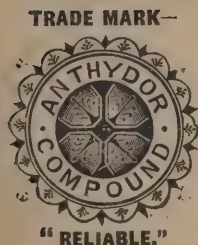
THE Buckingham Town Council, at their meeting held on the 1st inst., decided to adopt the recommendations of the committee and to instruct Mr. H. Bertram Nichols, C.E., of Birmingham, to prepare a pumping scheme of sewerage for the town on the lines laid down by him, and to submit the same within a fortnight to the Grand Junction Canal Company, so as to comply with the arrangement entered into by Mr. Higgins, Q.C., on behalf of the Council.

THE drainage of the eastern block of the Royal Courts of Justice is now being entirely reconstructed and replaced, and will take some months to finish. With the completion of this part of the building the whole of the drainage of the Law Courts will have undergone a thorough overhaul, and when finished all the latest sanitary appliances will have been provided for the various lavatories, &c. More direct access to the waiting-rooms for witnesses and others will shortly be provided by the construction of doors leading straight from the court corridor to these rooms. The first one to be opened out will be between Queen's Bench Court 9 and Probate Court 1, and will be cut through the stone wall of the court corridor.

ONE of the inspectors of the Local Government Board has held a series of inquiries into applications of the Manchester City Council to borrow sums amounting in the aggregate to more than 260,000l. Of this, 100,000l. was for the extension of the electric-light system in the city, 100,000l. for works of sewerage and sewage-disposal, 50,000l. (in excess of present borrowing powers) for the building of the technical school, and 10,000l. for the replacing of defective drains in the poorer parts of the city.

AT the meeting of the Airdrie Town Council it was announced that Mr. Alexander, of Airdrie House, offered to present the town with the Mill Field, as a public park for the town. The ground extends to nearly eight acres, and is in a central position.

AT the meeting of the Association of Birmingham Civil Engineer Students, held under the presidency of Mr. Robert Godfrey, Mr. H. C. Adams, hon. secretary, read a paper from Mr. H. H. Marsh on "The Relative Efficiency of Round, Flat and other forms of Tie Rods in Roofs." Mr. Marsh dealt with the three commonest forms of roof principals, namely, (1) with the tension principals composed of round rods; (2) with the



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tension principals composed of flat bars; and (3) with the tension principals composed of angle bars. Having given a detailed description of each of the three types and a comparison of their relative weights and cost, he said that in buildings where appearance was the chief consideration, as in public buildings, type 1 recommended itself; in cases where first cost was the primary object, and where the principals themselves were not subjected to lateral wind pressure, type 2 should be used; but in sheds which were open, and therefore exposed to the force of the winds, type 3 was most suitable, owing to its great lateral stiffness.

THE Bill promoted for the purpose of establishing a new cattle market at Bootle, Liverpool, with railway approaches and landing stages at the north end of the Mersey, for the accommodation of the Irish cattle trade, has passed the select committee of the House of Commons. The capital of the new company incorporated under the Bill is 400,000*l.*, a third of which sum is to be expended on the new market, and the remainder on general improvements.

AT the meeting of the Greenock School Board it was stated that plans had been received from nine architects. Much consideration had been given to the plans, but probably professional assistance will be called in before a decision was arrived at.

THE *Irish Times* says:—The Youghal Town Commissioners have decided to contribute a sum of 1,000*l.* towards the fund for the erection of a barrier against the encroachments of the sea, and the committee of the Cork Grand Jury have expressed a favourable opinion on the subject, and will report to the grand jury at summer assizes. Mr. Kirby, county surveyor, has prepared a map showing that should the sea break in permanently, it would cover an area extending at least three miles in length, covering all the roads in the vicinity and portion of the main road to Cork. The Town Commissioners have appointed a deputation to wait on the directors of the Great Southern and Western Railway Company with reference to the contribution of the company to the project.

AT the meeting of the East of Scotland Engineering Association, Mr. William Simpkins, president, in the chair, Mr. Edgar H. Fairgrieve read a paper on the "Stability of Voussoir Arches," in which he described the principles involved and the necessary conditions for attaining stable equilibrium in the different forms of arches, abutments, piers, &c. He showed graphically how the linear arch for any load can be

drawn, and the application of graphic statics generally in the treatment of the subject.

AN inquiry has been held by the Local Government Board in respect of two applications for borrowing powers made by the Southport Town Council. The first was in respect to a sum for foreshore improvements. For the construction of a marine drive and the connection of the two lakes the Corporation had been empowered to borrow 20,000*l.* They now proposed to lengthen and raise the bridge over the junction of the lakes, so as to make one continuous slope from the Promenade, and this and other work which the alteration involved would cost 8,500*l.*, for which they now applied. The second application related to the electric-lighting system, which was put into operation last November. The present borrowing powers amounted to 28,000*l.*, of which they have already expended 18,746*l.*, leaving a balance of 9,254*l.* Already more than 2,000 lamps were wired on the mains more than the generating plant could really supply, and the electric-lighting committee proposed to extend the buildings and power of the station to meet the present growing demand and to enable them to tap the residential district of Hesketh Park. The cost of this work was estimated at 21,250*l.*, and over and above the balance in hand they applied for power to borrow 12,000*l.*, in addition to 3,500*l.* for street arc lighting, making 15,500*l.*

AT the meeting of the Walsall Town Council, the health committee reported that a house-to-house inspection of 1,633 houses in 33 streets in the town had been made; and that they had under consideration the draft plans prepared by the borough surveyor for the proposed epidemic hospital, but, having regard to the great cost of carrying out the same, they had requested him to prepare modified plans so as to reduce the cost.

THE death has occurred of the burgh surveyor of Gourrock, N.B., who was held in the greatest esteem by all the community.

THE death is announced of Mr. T. C. Wakeling, architect, at Merthyr, having by mistake taken an overdose of chloral.

IN consequence of the enormous increase in the tobacco imports, the Mersey Docks and Harbour Board are considering a new scheme to meet the warehousing requirements of the tobacco trade.

THE Greenock School Board, considering that public baths are required, and in default of town baths being provided, propose to erect baths in connection with the schools.

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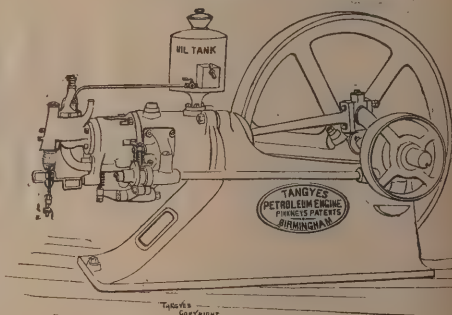
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THE spring meeting of the Iron and Steel Institute will be held in London on Thursday and Friday, May 9 and 10 next. The building operations at the Civil Engineers' rooms will prevent the meeting from being held at their house as has been the usual practice, and it will accordingly be held at the rooms of the Society of Arts. The presidential address will be delivered by Mr. David Dale, and the Bessemer gold medal will be awarded to Mr. H. M. Howe. Mr. Herbert Scott will communicate a paper on the iron ore mines of Elba; and Mr. W. J. Keep, of Detroit, U.S.A., will contribute a paper on tests of cast-iron.

THE annual general meeting of the London and Lancashire Fire Insurance Company will be held on Thursday, April 25, at the Law Association Rooms, Cook Street, Liverpool.

TRADE NOTES.

THE Borough Cemetery Chapels, Nelson, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

WE learn that Messrs. Charles Tighe & Sons have granted to Messrs. Chubb & Sons, of Queen Victoria Street, E.C., the sole right to manufacture and sell the patent door furniture, and they will be obliged if all orders in future are sent direct to them.

WE hear that Mr. R. Merton Hughes, builder and contractor, Birmingham, has obtained the contract for the Bridgworth and South Shropshire Infirmary at Bridgnorth, Mr. Edward C. H. Maidman, architect, 1 Comely Bank Avenue, Edinburgh, and quantity surveyor Mr. W. E. Davis, Falcon Court, 32 Fleet Street, E.C.

A TENDER has at last been accepted for the erection of a free library at Abingdon. Mr. J. G. T. West, of Abingdon, is the architect. The Governors of Christ's Hospital have accepted the tender of Mr. Grant, of Banbury, at 1,848*l*. The highest tender amounted to 2,435*l*.

A FIRM in Leeds have lately been devoting attention to the production of scagliola work, in imitation of marble, for decorative purposes in interiors.

WE are informed by Mr. A. C. Motte that he is no longer with Messrs. W. Walker & Sons, of Bunhill Row, E.C., having entered into an engagement with Messrs. S. J. Waring & Sons, Limited, of 181 Oxford Street, W. (also of Liverpool and Manchester), general house furnishers and decorators, and probably the largest manufacturers of high-class cabinet and interior woodwork.

BUILDING AND BUILDERS.

AT the meeting of the Prescott Guardians it was agreed that the new infirmary should be built on the Holt estate, near the present building. Mr. Gandy is the architect carrying out the scheme; it will cost about 24,000*l*.

THE sub-committee of the Glasgow Corporation have recommended the erection by the Corporation of tenements of shops, warehouses and dwelling-houses in Trongate, King Street and Parnie Street, to the aggregate value of 29,000*l*.

THE Helensburgh authorities intend to borrow 1,200*l* for reconstruction of sewers.

THE executive committee of the Association for the Promotion of Art and Music in the City of Glasgow have received from the architects a report on the progress of the Art Galleries in Kelvingrove Park during the month of March. In the central block the outer walls at the north end are up to the window heads. The main towers are nearly up to the stipulated height, and the building of piers and walls at the south end is in progress. The iron stanchions required for same have come to hand. In the east wing the southern outer wall is up to the required height, and in this wing and the western wing the glazed brickwork in areas and lavatories is being proceeded with.

THE *Leeds Mercury* says:—The late Mr. Scott, of Hunslet, a well-known worthy, who died some little time ago, left in his will 10,000*l*. to provide almshouses for ten deserving poor people resident in that township. One-half the sum was to be spent in the purchase of a site and the erection of the buildings, while the other half was for an endowment, which it is now expected will provide 8*s*. per week for each person. The necessary land has been secured at Woodhouse Hill, Hunslet, and the plans have been prepared by Mr. John E. Leak, architect, Waterloo Road, Hunslet, and are now before the building committee of the Leeds Corporation awaiting their approval.

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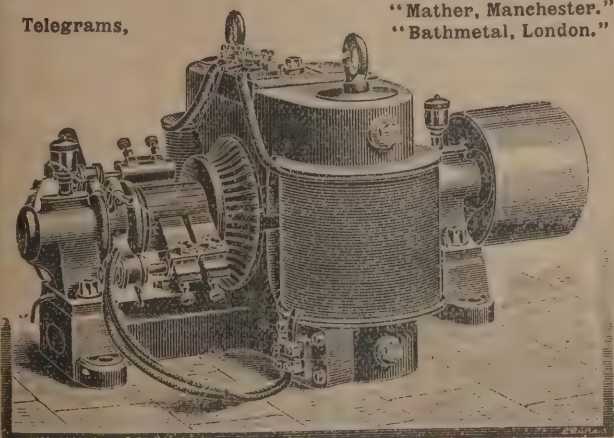
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ELECTRICAL.

THE tender of the Thomson-Houston Company has been accepted by the municipality of Paris for their overhead electric tramway system in some of the outskirts of the city, and for their culvert system in the narrower streets running towards the centre of the city. The Thomson-Houston Company have made arrangements for the manufacture of all their machinery and appliances for use in the United Kingdom by Sir W. G. Armstrong, Mitchell & Co., Limited, of the Elswick Works.

AT the meeting of the Hull Town Council, Dr. Holder, moving the adoption of the committee's minutes, urged that that portion recommending that specifications for the new engine, dynamo, boiler and switches, instruments, &c., and that quotations be obtained, be approved. Discussion ensued, and members spoke strongly in favour of keeping the work in the town. It was suggested that tenders should be invited from local firms for such portions of the work as could be done in Hull.

MR. HENRY HARBEN, of Hampstead, has decided to erect at his own expense a building at Littlehampton, to cost 20,000*l.* The home will contain reading-rooms, &c., and all the latest improvements, and will be lighted throughout by electricity. The work will be put in hand forthwith. Mr. Wheeler is the architect.

THE BUILDING EXHIBITION.

AMONGST the exhibits not yet noticed,

Thwaites Bros., Limited,
of the Vulcan Ironworks, Bradford, showed an Andrew-Howatson patent diurnal water softener, capable of softening 1,000 gallons of hard water per hour, models of Andrew-Howatson softeners and filters.

C. Davidson & Sons, Limited,
of Paul's Pier Wharf, London, showed their roofing and foundation felts.

Skey & Co., Limited,
of Tamworth, showed a large selection of sanitary appliances, &c.

Wybrow's Fire-escape Balcony Staircase Company,
Birmingham, showed a model of Wybrow's fire-escape balcony staircase, constructed for palaces, mansions, theatres, hotels, asylums and warehouses.

John Line & Son,
of Aldersgate Street, E.C., and Reading, showed a quantity of artistic wall-papers, among which were included the Anaglypta wall-papers and Lincrusta-Walton wall-papers.

Arthur Lee & Bros., Limited,
of Bristol, samples of white and coloured marbles in ordinary use for decorative purposes, photographs of marble works executed at the Clifton Pump Room, designs for marble mosaic floors, and samples of marbleised slate.

Corporation of the City of London.

At this stand was shown a quantity of illustrations of the many works designed and carried out in the City of London by the late Horace Jones, City architect, and also one by J. B. Buning. A model of the new council chamber at the Guildhall was also shown.

Royal Institute of British Architects.

The display at this stand did not fulfil the expectations that might have been formed, the loan collection of drawings not being of the best. If we remember rightly, many interesting specimens of old wood-carving lent by Professor Banister Fletcher, were shown. At several other stands could be seen other specimens of old wood-carving lent by the same gentleman.

Among other exhibitors Messrs. Samuel Wright & Co., specimens of fibrous plaster enrichments; Robson & Co., Sunderland, a ventilator; the Mechanical Inventions Syndicate, Limited, door check and spring; R. & J. Dick, of Glasgow and London, their Balata driving-belts; J. C. Broadbent & Co., silicate cotton or slag-wool; S. J. Wiseman, Southampton, ventilating window, door and casement-fasteners; H. J. Skelton & Co., sections of rolled steel joists, girders, &c.; J. J. Hopkins, West Brompton, Staffordshire, blue bricks and tiles, Broseley roofing tiles, &c.; J. Duckett & Son, Limited, of Burnley, various of their sanitary specialties and appliances; A. C. W. Hobman, a number of articles in mosaic and Clifton stone; W. Garstin & Sons, marblework and also leaded granite concrete; C. Beale, of Eltham, red pressed bricks, ridge tiles and other pottery; S. A. Macfarland, statuary for monumental purposes; Morgan & Co., reversible windows and casements; C. H. Wilkinson, venetian blinds.

Mr. H. Spear, morticing and tenoning machines, circular saws for iron and wood, and saws of all other kinds, including hand-saws; T. Middleton & Co., a combined brick, tile and

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pipe machine; Pullan & Mann, Leeds, screw brick and tile press, with patent power driving gear; Samuel Jefferies, Dudgeon, Stroud, automatic brick-cutting tables; West's Patents Syndicate, Limited, moulding machines for domestic and garden pottery; Wm. Johnson, Armley, dry press brick-making and pressing machine. Some half a dozen firms showed models of their continuous kilns.

Several lectures and conferences were held at the Hall, which took place during the afternoons. The first of the lectures was by Professor Banister Fletcher on the "London Building Act;" a second by Mr. Henry Ansell on "Glazed Brick-making;" "Comparative Architecture," by Professor Banister Fletcher; "British & American Brick-making," by Mr. Alfred Crossley; "Chemical Aspects of Clay-working," by Mr. J. T. Norman; and "Electricity applied to Public and Private Buildings," by Professor Henry Robinson.

The Exhibition was each day enlivened by a concert which was, for the first week, under the able direction of Miss Lilian Clausen, whose ladies' orchestra, known as the Pompadour Band, and consisting of some eighteen fair performers, richly attired in the picturesque costume associated with the sprightly favourite of Louis XV., played a varied selection of pieces with a *verve* and precision which reflected the greatest credit on their talented conductor. Miss Clausen's company, being "booked" for the provinces, was replaced during the second week by Mr. Glenn-Wesley's concert company, which comprised Madame Jessie Strathearn, silver medallist R.A.M. (soprano), Madame Joyce-Maas, who, we are informed, is a sister of the late celebrated tenor (contralto), Messrs Henry Slaughter and Arthur Barlow (tenor and baritone). The programme, if it did not present any striking novelties, was sufficiently varied, and the items of which it consisted were artistically rendered, and received with evident pleasure by an appreciative audience. Indeed on Thursday—the last night of the Exhibition—the company got quite an ovation. Madame Strathearn, whose performance was undoubtedly the best of the evening, received a double recall for both her songs, Adams's "Star of Bethlehem" and Levey's "Esmeralda," an honour which was also accorded to Madame Maas for her rendering of "The Better Land," while the gentlemen were equally well received. In addition to the vocal items, Mr.

H. Distin gave two well-rendered *solis* on the cornet, Hatton's "To Anthea" and "Solitude," by the conductor, Mr. Glenn-Wesley.

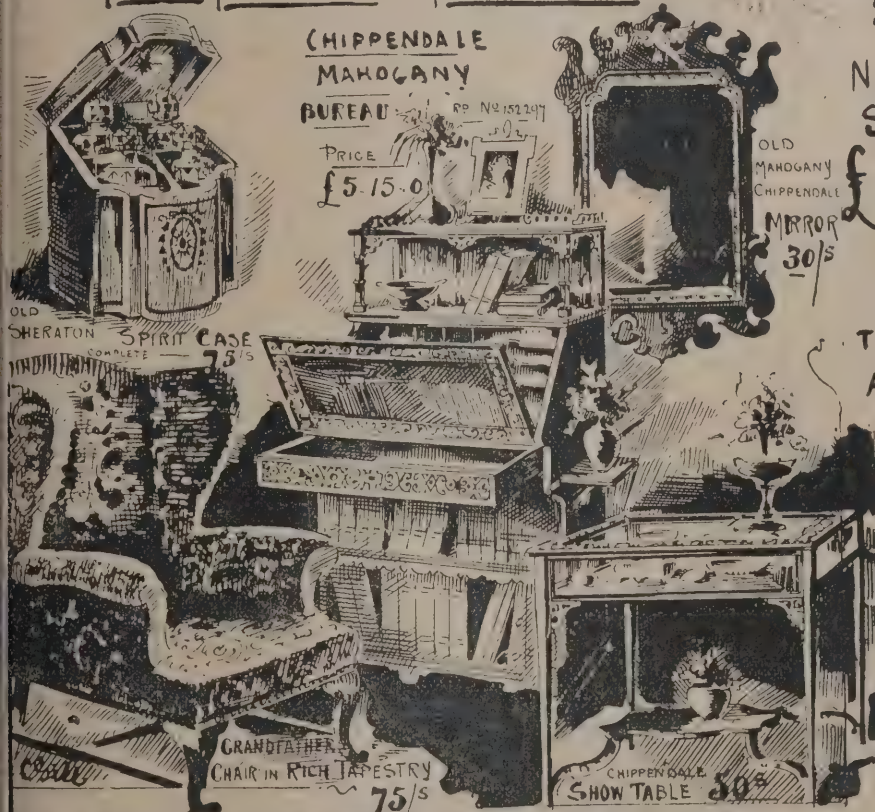
The Duke of Fife on Thursday night in last week presented silver and bronze medals and certificates to the workmen who were successful in the handicrafts competition held in connection with the Building Exhibition at the Agricultural Hall. Among those present were Professor Fletcher (who presided), Mr. Preston (past master of the Carpenters' Company), Mr. Gilbert Wood, Mr. Blashill (architect to the London County Council), Mr. Benedict, C.E., Mr. Porter and Mr. Montgomery (the organiser of the exhibition). The Chairman said the competitions had been one of the principal objects of the exhibition. Thirty-nine workmen competed, the trades represented being those of the bricklayer, carpenter, joiner, mason, painter, decorator, plasterer, plumber, tile-fixer and modeller. In the opinion of the judges these competitions and the technical education now being so largely imparted would not only become, to some extent, a substitute for the fast-dying system of apprenticeship, but would help the workmen of this country to more than hold their own against foreign competition. The awards having been distributed, a vote of thanks was, on the motion of Mr. Gilbert Wood, seconded by Mr. Benedict, passed to the Duke of Fife, who, in reply, remarked upon the fact that the comfort of every one—rich or poor—depended in a large measure on the building trade. It was therefore essential that the workmen connected with this industry should be thoroughly masters of their work. These competitions popularised good work and raised the standard of labour.

NEW CATALOGUES.

THE catalogue we have received from Messrs. Nettlefold & Sons, of High Holborn, which we recently referred to, is excellently printed and nicely bound in red cloth. It is copiously illustrated throughout, and it forms a very exhaustive compilation on general and builders' ironmongery. It will be found extremely handy for reference by architects and builders. Those engaged in building operations have a definite idea of

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what is required for any particular purpose, and will find a great choice afforded them under every kind. The articles that come under what we may term lock and door furniture are simply legion. But when every week sees some article improved or some new article invented, the reason must be that new wants arise or that older fashions have been improved to meet new requirements of buildings. To classify the various kinds of buildings by name would be an arduous task, and a list of them would take up much space. There are residential houses, mansions, halls, villas, cottages—such are the names of a few of our dwelling buildings. There are churches, schools, business premises of every kind, stables, factories, institutions of all descriptions. The smallest of buildings, a cottage for instance, has many doors, windows, including cupboard doors which cannot serve a useful purpose till fitted with locks, hinges, bolts, handles, &c. There is not only a variety to choose from for each class of building, but as the kind of building differs, there is a variety from which to select in each case. The door furniture—most excellently designed, as seen by the engravings in the catalogue—is ornamental. Even the plainest description can contribute its quota in this respect. The designer is also greatly helped out by the qualities of the materials he can work in. As to woods, there is oak, ebony, rosewood, walnut, maple and many other high class woods. Glass also is employed most effectively, and when metal is employed there is unlimited scope for a skilful designer. The chief door, or as it is usually called, the front door of a building, has its own additional variety of fittings—knockers, bell-pulls, letter-box fittings, &c. Space will not allow of giving more than the above notice of this catalogue, and even in our reference to door furniture allusion has not been made to a tithe of the articles. We must refer our readers to the catalogue. Any of them who are not engaged in building operations, if they take a mental tour of their houses and offices from top to bottom, will gain a very good idea of the legion of articles that have been made use of to render the building complete.

THE immense development that has taken place of late years in applying electricity to so great a number of uses is amply shown by glancing over the catalogues of Mr. G. Straus, of 130 Queen Victoria Street, E.C., which give a good idea of the numberless fittings, &c., that are required for putting electricity to practical purposes. "Apparatus and Accessories for Telegraphs, Telephones and Lightning Conductors" is the title of

the two lists, the second of which is supplementary to the first. In the space at our disposal we confine ourselves to calling attention more particularly to the bells and telephones and their accessories. The electric bells can be had in various excellent kinds increasing in superior quality. Different kinds of bells also serve to meet different purposes. Some have the automatic interrupter, others are furnished with an indicator disc. Then there are the continuous action bells and also electric bells specially made for fixing in the open air, portable electric bells, &c. Special attention should be called to Nos. 533, 1,660 and 1,670 (telephones). There are also new designs in bells, and among them we may refer our readers to the one illustrated in Nos 850 and 851 in connection with a dry battery, forming an exceedingly original and convenient form of portable bell sets.

MALTON CHURCH.

A NEW pulpit and baptismal font have been recently erected in the Catholic church, Malton. The pulpit is of Caen stone, and is in the thirteenth-century style. The front is divided into five panels, with coves and angles, showing beaded mullions and arches over arches deeply sunk, with plate tracery, trefoils, quatrefoils, &c. There is an ornamental book-rest, supported by moulding from mullions and cornice above. The sides are pierced, and show beautiful examples of bar tracery, to correspond with the front. These are draped with crimson tapestry from the sill to the handrail, and are divided into openings the same as the front and richly decorated. There are two plain panels between plinth and string, which are left for carving to be done hereafter. The pulpit is fixed against the south wall of the church, immediately outside the communion-rail, and is entered from the sanctuary between two ornamental pillars. The work has been executed by Mr. Anthony Lyons, builder, of Norton, near Malton. The baptismal font, which harmonises admirably with the altar, pulpit and other architectural features of the church, is the gift of Mr. A. Lyons. The base is of Robin Hood stone splendidly polished. The shaft and capital is of Roche Abbey magnesian limestone, circular and moulded. The font itself is of Carrara marble, octagonally shaped. The lid, of dark brown oak with brass fittings, assumes the form of a cone, surmounted by a cross. It stands in the south-west corner of the church, and has the following inscription carved on the base, "Ex dono Antonii Lyons, A.D. 1895."

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SAND BLAST PROCESSES.*

A PAPER on the sand blast was read in this room by Mr. William E. Newton, in February 1875. The invention was then in comparative infancy as regards apparatus and its practical applications in manufactures and the arts. Notwithstanding its continual developments in both particulars, the sand blast is still not popularly known; it is considered that something more may now be said on the subject.

The sand blast was invented by Mr Benjamin Chew Tilghman in 1870, and, stated shortly, consists of a stream of sand or other abrasive powder, usually dry, but sometimes mixed with water, projected with more or less force and velocity to strike and pulverise the surfaces of glass, stone, metal and other materials upon which it is directed.

It has been frequently pointed out that, in this invention, Mr. Tilghman has really borrowed or adopted from nature herself, inasmuch as he has intensified and put to use a natural force of which the effects are always apparent under favouring conditions; that is to say, wherever we find large deposits of loose sand exposed to prevalent winds, by which the sand is caught up and blown against any hard substance, such, for example, as the glass in a window, which soon becomes depolished and obscured by the contact of the sand; or stone, the surface of which, with time, is sensibly roughened and sometimes scored in a manner quite distinct from ordinary weathering.

The abrasives used in the process include ordinary inland silicious sand, sharp builders' sand, powdered glass, emery, from fine to coarse, chilled iron sand and steel shot; and the streams of these powders are forcibly projected through

variously formed nozzles by means of steam, by currents induced by exhaust air, by blasts of air, and latterly and more conveniently, by compressed air. Sand, from its plenteousness and general suitability, is mostly employed; that used in London comes from Reigate, and when freed of pebbles and impurities is again sifted into several sizes for different classes of work.

Grains of sand have numerous angles, and the action of these grains—as also that of the other abrasives mentioned—upon the surfaces of glass, stone or metal is due to the circumstance that every individual grain in the incessant infinite number in the stream urged violently forward has all its energy instantly arrested, transferred and concentrated upon its point of impact, where it produces a minute pit or depression; and as every grain in the shower acts alike, the abrasion resulting from the whole is perfectly uniform in depth and texture or roughness.

The action, moreover, is extremely rapid; as you will see later, a momentary application depolishes glass over any space that can be covered by one stroke of the sand shower, instantly changing the previously bright surface to obscured, or that known as ground glass. A little longer exposure cuts more deeply, and, with further time, apertures are readily pierced through sheet and plate glass.

Stone, marble, slate and granite are just as amenable to its action. Iron, steel and other metals have their surfaces easily reduced, and smoothly or coarsely granulated, according to the force and abrasive powder used; but all these materials, being less brittle than glass, take a rather longer time. Speaking generally, it appears that the harder or more dense the material acted upon, and the higher the velocity given to the sand, the more rapid the cutting action; and the finer the abrasion, and the lower the pressure of the air or steam, the finer the granulation produced. It is also remarkable that it is by no means necessary that the abrasive be harder than the material to which it is applied, thus hardened steel and corundum are readily pierced with sand.

This granulating, scaling, incising and piercing, however, is but one-half of the process, for if the work be partly covered and protected by some slightly yielding but tough substance, adhesive, or in the form of a metal template lying closely upon it, this interposed substance instantly diffuses the shock of the particles and neutralises their abrasive power. The action of the sand blast is thus confined to the unprotected portions of the surface, and these overlays and templates are used on

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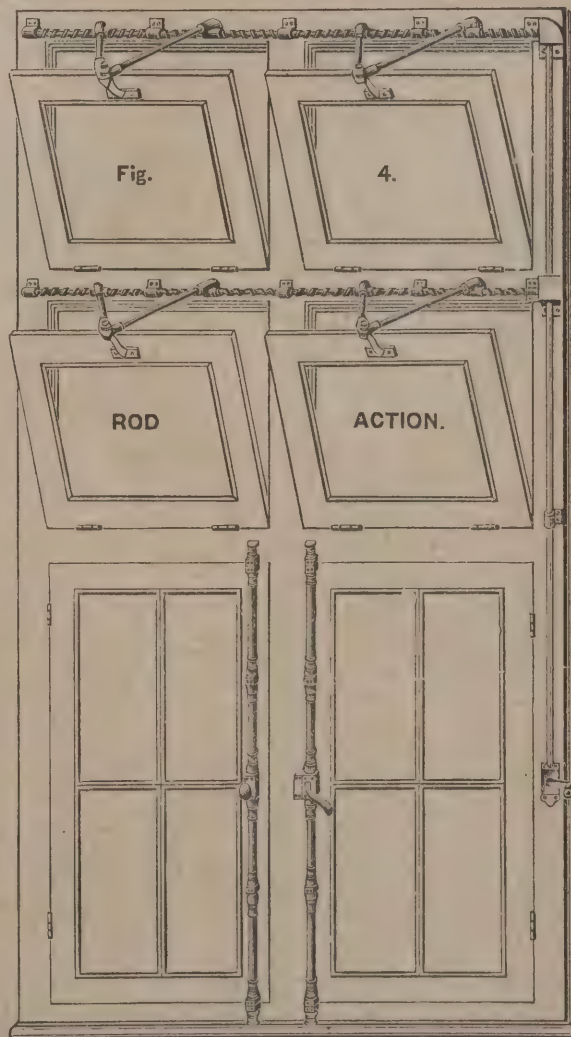
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glass, stone, slate, pottery and metal for surface ornamentation, for deeper intaglio and perforations.

All results from the sand blast arise from the cumulative action of the immense number of grains of the abrasive powder striking the surface; but the impact of every individual grain does but an infinitesimal portion of the work; hence, as unusual as important, the very rapid erosion is really most gentle in character, with total absence of risk of damage to the material, however fragile, as for example the splaying or chipping of edges met with in carving stone by hand.

The sand blast is in constant use for obscuring or producing a uniform granulation known as ground glass, on sheet glass, lamp globes, the bubbles for incandescent lights and the like; for the decoration of sheet or objects in glass with ornamental designs, in which the pattern or the field may be left bright and transparent, of which there are numerous varieties, one being on glass of two or more thicknesses of different colours, to leave the design of one colour on a field of another; for the decoration of glass table-ware, and the labelling of measures, chemists' and other bottles. Several examples lie on the table.

In metal, for the removal of the hard scale, so destructive to cutting tools, from castings and forgings. The removal of the scale from sheet iron and steel prior to enamelling, galvanising, nickeling, tinning, &c.; the cleaning of tubes and brazed joints, largely used in bicycle work. Sharpening the teeth of files. For granulating or frosting electro-plate, gilding metal, gold and silversmiths' work, and jewellery; and the reduction to clean metal surfaces of larger works, ranging from the steel forgings of safes to armour plates.

On stone, slate and granite for incised carving and inscriptions in intaglio or relief; for cleaning off the grime from stone, granite and brick buildings, and, in contrast to this last, for the most delicate drawing for lithography.

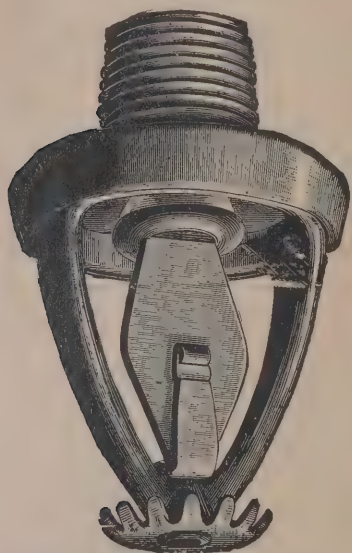
Among other purposes it is employed for removing fur and deposits in tubes and tanks, for cleaning off accumulations of paint and dirt within iron ships, for roughening the surfaces of metal rollers, for decorating coat and other buttons, for granulating glass to give it a key for ornamental painting by hand, for piercing the apertures in glass ventilators, for marking cakes of cement and glue, for marking pottery and in the manufacture of ornamental tiles, for smooth facing bricks to receive white glass or enamel, for refacing grindstones, emery and corundum wheels; for granulating celluloid films for photography, and on wood to bring out the grain in relief, and latterly for blocks for printing.

A list of its users cannot be attempted, but includes the names of Sir W. Armstrong, Charles Cammel, Chatwood, Sir John Brown, Jessop, Sanderson, Turton, Vickers, many English and foreign railway companies, Arculus, Chance, Dixon, Hartley, Hole, Pilkington and others.

The protecting overlays used in glass decoration are made of a quick-drying, viscid mixture of glue, dextrine, glycerine and any powdered colouring matter to give body; they readily wash off in warm water after use. Sometimes they are painted on by hand; for many repetitions they are printed from wood-block patterns on paper, then laid on the glass, and the composition transferred by rubbing, or it is applied through thick tinfoil stencil plates with a palette knife. For figures and original designs the glass is entirely covered with a sheet of paper dipped in the mixture, through which, when dry, the design is cut out with a pointed knife. Sometimes numerous morsels of the prepared paper are separately attached to the glass.

In all stencil plates there are many isolated solid portions, as for example the centre of a letter o, which have to be retained in their positions by bars or ties, which cross and interfere with the continuity of the apertures desired around them. For the best works, required in quantities, this is overcome by using two or more tinfoil stencil plates, the first giving the design, and the second pierced only with holes corresponding to these ties to blot them out. On the table there are some such stencil plates, with impressions showing their separate and combined results, and glass with the completed overlay from them.

Large sheets of glazing glass covered with their overlays are frosted as to the ground or pattern, whilst gently travelling upon two long, wide, horizontal surfaces or tables placed end to end with a small interval between them, by means of a narrow, uniform stream of fine dry sand, extending the entire length of this interval, impelled upwards by exhaust air at about 1 lb. pressure, to strike the constantly moving glass. This very long, narrow jet issues from between two iron plates, a quarter of an inch distant at their upper edges, or mouth, but more separated and also open below, beneath which the sand, supplied from a long, horizontal, hollow-plate screw of 2-inch pitch, falls from a slit in its case to a trough, and is caught and carried up by the exhaust air. After striking the glass the sand falls back into a chamber separated from that below but connected with the exhaust, by which latter it is carried through large pipes to a drum or sand chamber above. In this, after



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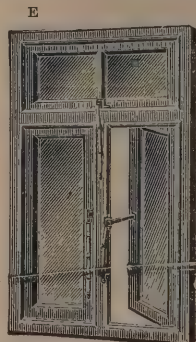
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passing through four double cylinders, placed radially in the head of the drum, the sand cleansed from the dust falls to the bottom to pass to the screw for reuse. Two spindles carrying a number of small indiarubber-tired wheels, one to either side of the interval between the tables, the one driving the other by gearing, hold down and traverse the glass. Machines with tables 5 feet wide will obscure sheet glass at the rate of about 300 square feet per hour.

A beautiful translucent variety, known as chip or crystalline glazing glass, covered with grey filaments and fern and feathery markings on an ice-like ground—specimens of which are on the table—is also remarkable for the peculiarities of its manufacture. The surface, first uniformly frosted with the sand blast, is then covered with a coat of strong glue, and when this has set, the sheets are placed in horizontal racks in a room heated to 160 deg. In the course of ten or twelve hours the hardening glue audibly cracks and springs off in patches, bringing away thin flakes of the glass with it. The fern-like markings are irregular portions of the original sand-blasted surface which remain on these flat conchoidal fractures.

This simple process was discovered by an accident, and put to use by Mr. Corsan. Beyond the curious fact that glue under such conditions will tear flakes from glass, the explanation appears to be that the hardening glue gradually blisters, and these blisters as they detach tear off more of the glass by their margins than towards their central portions, which latter leave the fern-like markings. By the employment of the ordinary overlays prior to frosting and gluing, the crystalline effect is sharply localised and confined to any portion of a design.

Lamp-globes and spherical objects are plain or pattern-frosted all over their superficies in an ingenious manner. The drum of the machine—about as high as its diameter—has a hinged cover and moves round on a central vertical pivot. Diametrically within the drum is a spindle, or rather the two ends of a spindle, its central portion removed and replaced by corresponding rods, with spring means of holding, which carry the glass globes. The globe, when in its place, is exactly in the centre of the drum, and the tube of the sand-blast, presented horizontally, points precisely to the centre of the globe. During the frosting the spindle is continuously turned and the drum itself moved round on its pivot through about a half circle, both automatically; the central line of the spreading sand shower—its most active part—thus always points to the axis of the globe, which secures absolute uniformity in the texture of the frosting. Dry sand and air at about 1 lb. pres-

sure are used for ordinary work, and very fine sand with steam at about 20 lbs pressure for the best class of this work. The globes are replaced with expedition and from 60 to 100 may be completed in an hour.

For large works in metal, for the removal of scale from castings and forgings, and obtaining uniform clean surfaces on plates for galvanising, tinning, &c., up to the heaviest, the production of such surfaces on armour plates—the last previously effected by planing and other expensive methods—it is generally necessary to take the sand blast to the work instead of the work to the apparatus. Compressed air is then generally employed, a means of propelling the abrasives which bids fair to supersede all others. The plant on a larger scale, but otherwise the same as that before us, is driven by any convenient power, and consists of an air-compressing pump, a store chamber for the compressed air and the blast apparatus; the last alone needs description.

Mr. Redman, of the Allan and Hill lines, used a compressor giving 60 cubic feet of air per minute, driven by the ship's donkey engine, a 15 cubic feet storage chamber, and builder's sand issuing at 10 lbs pressure from the 7-16 nozzle of a corresponding blast machine, in cleaning the between decks of the iron ss. *Austrian*, 2,882 tons burden, a cattle boat, from many years accumulated coats of hard sea paint, more than an eighth of an inch thick. The example is interesting, because the tough thick paint precisely resembled and resisted the sand blast, just as do the overlays used to neutralise its action on glass and stone; hence the pace was slow, about 12 or 14 square feet per hour. But the paint was entirely removed down to the clean metal, and, as I was assured by the operatives, far better in angles and around bolt heads than they could possibly have done it in their accustomed manner with hammers, chisels and scraping.

The sand blast machine was then replaced by a cognate apparatus, patented by Mr. Redman, containing mixed oil paint; the latter atomised therein and blown as spray by the compressed air through a hose and nozzle, after the same manner as the sand. The exchange of sand for paint is perfectly successful, a uniform coat of flatted paint being laid in the ship on a wall space of 60 feet by 5 feet per hour. A similar arrangement of air compressor, driven by 5 horse power, a chamber for the air, used at 15 to 20 lbs. pressure, a receptacle for the air and paint to mix, nozzle and long hose was used with enormous saving of time and labour in painting the buildings at the World's Columbian Exhibition, Chicago.

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The sand blast used for removing the scale from steel armour-plates at Sir John Brown & Co's Works, Sheffield, has the air chamber of 15 feet capacity, and the compressor, driven by 3 or 4 horse-power, making about 180 revolutions, will charge it at the rate of 60 cubic feet of air per minute. The steel blast pipe of seven-sixteenths bore at the end of the flexible tube, which latter is some 26 feet long, is held at an angle of about 20 deg to and at 3 or 4 inches from the armour plate, and with chilled iron sand issuing at 10 lbs. pressure, the blast thoroughly cleans off the scale at the rate of 1 square foot per minute. The operator protects his face from the dust by a veil of fine wire gauze, or with more comfort by Mr. Mathewson's air helmet, one of which is on the table.

Tilghman's iron sand, just mentioned, is a remarkable abrasive formed of minute spheroidal pellets of hard chilled iron, produced by letting the molten metal fall through fine holes in fireclay, below which cullender, in an atmosphere deprived of all oxygen, the streams are struck and atomised by jets of superheated steam; the resulting red-hot globules drop into water and become chilled to intense hardness. Sifted into sizes, they vary from 80 minute as forty-thousandths up to about one-sixteenth of an inch diameter. This material, of which Messrs. Harrison, of Middlesbrough, have lent samples, is also extensively employed to replace sand and emery in sawing stone and granite.

A difficulty has always existed in the wear of the blast pipe, especially when its rear end is separated from the front end of the steam or air pipe, and the sand is picked up from the space between the two; Mr. Tilghman long ago pointed out to me that, if these two pipes be not precisely in one axial line, the wear at once becomes excessive, necessitating frequent renewals. Wear is now nearly and ingeniously prevented in Mr. Mathewson's round and flat blast pipes, which postpone the mingling of the steam or air with the sand until both have issued from the nozzle.

Sharpening the teeth of files is a notable sand blast process. The teeth of files are formed partly by uniformly distant parallel cuts or indentations, in two series crossing one another, and partly by the burr driven up in making them with sharp, chisel-edged tools and in machines.

Worn-down files are resharpened in the sand blast by being slowly drawn several times from tang to point between two converging streams of fine sand and water—sand worn so fine in grinding plate-glass as to have become valueless for that purpose, and a waste product, is preferred—projected by steam

at about 60 lbs pressure, which passes on from the file into a receptacle for reuse. The effect is rapid, and on both sides of a flat or on all four sides of a square file simultaneously, a 14-inch rough or bastard file being resharpened in from two to three minutes; second cut and smooth files still more quickly produced by the sand-blasting away of the curved until they again meet the upright sides of the teeth, and at but little less angle than before. The file throughout the process is drawn across a piece of gun-metal fixed between the sand blasts, and the equal hang of the teeth to this "feeling piece" tells the operator the resharpening is uniform from end to end.

Worn-out files so resharpened—tried in the writer's workshops—prove nearly as good as new files on iron and steel, but owing to the small loss of angle in the teeth, less so on brass and gun metal, for which the workmen reject them.

Further, and as regards new files, it is found that the teeth do not always prove absolute points, but sometimes curl over, almost imperceptibly, towards the burr sides. A slight exposure to the sand blast at once removes this undesired, hook-shaped burr, leaving the pyramidal points keen. Messrs. Charles Cammel, Turton, Sanderson and other large file manufacturers use the sand blast for this purpose.

Opinions long differed as to its value for new files. I have here a new ordinary 16-inch bastard-cut file, one side of which has been sand blasted and the other not—the means of holding this file at any inclination—and a block of gun-metal. I place the unsharpened face uppermost and the block upon it, and will raise the file until the block slides, which it does at an inclination of about 23 deg. Leaving the file at this angle, I turn it over with its sand-blasted face uppermost and replace the block, which now stands still; and I will again raise the file to the angle, the increased sharpness of the teeth will retain the block, which appears to be 45 deg.

A 16-inch bastard-cut file is sand blast sharpened in 30 seconds; with a little longer exposure the teeth may be made so keen that the file will retain the block until 70 deg; but such excess of keenness sacrifices strength, and the teeth become brittle. In practice the best combination of sharpness and strength appears to be reached when the test-block slips at 42 deg. to 43 deg.

As a practical test I am informed that a definite number of strokes made by a practised hand, with an ordinary new 14-inch bastard file on gun-metal, will remove a certain weight of metal (say 1·19), but that a similar new file that has been sand blasted, used by the same individual, under precisely the



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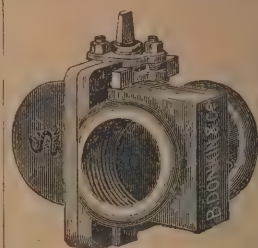
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same conditions, will remove nearly twice as much (or 2'19). There is a less marked but appreciable difference on iron and steel, the figures being '988 to 1'2 on cast-iron, '352 to '363 on wrought, and '674 to '758 on steel.

Sixty thousand dozens of new files, of all shapes, cuts and dimensions were sand blast sharpened for the trade at Tilghman's Sheffield Works during the year 1894. The gross trade list value of these files was 63,680*l.*, and the charge for sharpening them was 2½ per cent. on such gross list value. The process being now largely used by many file manufacturers, it is estimated that inclusive of this quantity there were no less than 240,000 dozens of new files sand blast sharpened during the same period in Sheffield alone.

The wet sand and precisely similar apparatus (except that the two blasts strike the file at right angles instead of at about 20 deg. to its surfaces, so as not to wear away the one side of the teeth) is now also very generally used for scouring new files, that is, for cleaning their teeth from the salt and yeast adhering after the process of hardening.

Many now also subject files to a short exposure to the sand blast from time to time during use, thus sharpening them like other tools, to prevent their teeth from ever wearing down to flats. Messrs. Platts, Beyer Peacock, Krupp, the Midland, the London and North-Western and other English and foreign railway companies, the Royal Small Arms Factory, Enfield; the German, Austrian, Japanese and other arsenals and dock-yards, and numerous other large users, include the apparatus in their plant solely for this purpose.

For stone, marble, slate and granite the abrasives are sand, emery and chilled iron sand, delivered at from 10 to 15 lbs. pressure, usually from the compressed-air apparatus already described. The work, which we shall show you presently in operation, is at present confined to intaglio or incision at right angles to the surface, leaving the design on the ground in relief; there are several examples on the table. The overlays are similar to those for glass; if for original designs they are cut out of thick porous paper saturated with the glue and dextrine, by which also they attach to the plain or polished stone; for work often repeated they are frequently iron stencil plates. The quick yet gentle action of the process annuls all risk of "plucking" or splaying the stone, but in some materials and marbles and in granite, which may be considered conglomerates, the harder are rather less cut away than the softer constituents; the sparkling granulation then produced is itself decorative, but if required it may subsequently be smoothed and polished.

The same apparatus is used for cleaning off the sooty weather deposits from stone, granite and brick buildings. Mr. Meikle, at Glasgow, employs a portable engine and the air-compressor mounted on a truck for conveyance from place to place; an air chamber of 15 cubic feet capacity and a small sand blast apparatus, fixed on a railed stage raised or lowered by tackle, as used by painters; the air chamber connected by lengths of 2-inch vulcanised tubing to the compressor on the pavement below. The abrasive, sharp builders' sand, issues from a ½-inch nozzle at from 7 to 10 lbs. pressure. The cleansing is thorough, and, I am told, can be confined to the grime, leaving the plain or carved surface of sandstone similar to that newly worked, and not even roughening the polish on granite. The inclusive cost does not exceed 1*s.* 6*d.* per square yard. There is a slab of sandstone before us showing the dirty incrustation, a portion cleansed by the sand blast, and a third portion subsequently treated with a coat of silicate solution, used by Mr. Meikle to prevent future deposits from again eating into the stone.

THE LONDON BUILDING ACT.

THE subject discussed at one of the conferences during the Building Exhibition was the new London Building Act. Professor Banister Fletcher pointed out that the experience of the working of the Act during the first quarter it was in operation was disappointing. The Act must have cost 10,000*l.* It had not been brought before any higher court than those of the London stipendiary magistrates, but they had had one decision by Sir John Bridge which must carry weight. In the case relating to Messrs. Shoolbred's premises in the Tottenham Court Road, which turned on the point whether extensive additions to premises were of the warehouse or domestic class, Sir John Bridge was reported to have declared that the sub-section dealing with the prescribed angle of 63 deg. and the imaginary horizontal line was "perfectly unintelligible." His condemnation included all other sections, which he said were intelligible in two different ways, and capable of two distinct constructions. Eventually the magistrate decided the case on the question of fact and without reference to the Act. The Professor said he was bound to declare that the Act was not satisfactory to the architectural profession, and the result only showed the difficulty of framing building laws to meet all possible cases. It was the opinion of the late Lord Beacons-



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field that if the judges only treated the intentions of the House of Parliament with as much respect as they showed to the interpretations of judges, there would be few difficulties of administration. Some London magistrates took decisions and interpretations under the old building Acts and endeavoured to apply them to the new Act. Nothing could be more fallacious and it would certainly lead to errors. The difficulties of passing such an Act, especially in the way of definitions, were enormous. This was evident from the fact that, as passed, the new Act contained no definition of a "building." The clause as drafted in the House of Commons, but which was struck out in the House of Lords, read, "A 'building' shall mean an erection comprising a cubical space defined by walls, piers, posts, columns, or other supports, and a roof, whether the erection is wholly enclosed or not, and whether it is fixed on permanent foundations or not, and of whatever material the supports, enclosures, or roof may be composed." It was objected that the definition would include three short trestles and a sheet of tarpaulin, and the clause was consequently expunged. In the Act as passed, in section 5, subsection 27, a "public building" included an hotel or lodging-house where the building extended to more than 250,000 cubic feet, and had sleeping accommodation for more than a hundred persons.

Thus, if an hotel had accommodation for a hundred guests the corridors, passages, landings and flights of stairs need only be of wood; but if another person slept there these features must be of fire-resisting materials. It followed, therefore, that according to the strict letter of the law, the district surveyor ought to make domiciliary visits periodically to such buildings to ascertain if a double bed were substituted for a single one, when the whole character of the construction might have to be altered. The section relating to the notice of objection which a district surveyor was to serve on a builder or building owner, relative to alterations required in the plans already submitted, was ambiguous and would without doubt have to be settled by a court of law. Hitherto the architect or builder brought his plans and drawings to the district surveyor, who as a matter of courtesy pointed out any defects or contraventions of the Act, and they were amended. Under the new Act the district surveyor had to give a notice of objection based on the builder's notice and not on the plans and drawings. From this it would seem that the builder must be allowed to go on with the works, and the district surveyor's opportunity for objection to irregularities arose when they were executed. The district surveyor kept no drawings, he would therefore not be able to

prove his points. District surveyors would be likely to follow the old practice, but sooner or later difficulties would arise. Among the omissions in the Act might be mentioned one relating to pugging of floors in habitable rooms constructed over stables. It was provided that a 3-inch layer of concrete should be placed between the floor and ceiling between joists, but there was nothing providing that the materials should be fire-resisting, or should serve any other purpose than to prevent effluvium ascending into the rooms from the stables. Nothing was said as to whether the joists were of wood or iron, nor was the point made more clear by the schedule. Then, again, as to the heights of future buildings next the street. Where a street was laid out before August 1862, if the street were 50 feet in width, a new building might be six storeys in height, in addition to two storeys in the roof; and if the street were less than 50 feet wide, the height might only be equal to the width of street. The question consequently arose, was the diagonal line regulating the height by the street's width to apply to the rebuilding of old premises? He thought it did not, and could not be made to apply to the reconstruction of old buildings, but that they might be re-erected to the same height as the old buildings which were replaced. Again, let them take the case of old lofty buildings in an old street where a wider thoroughfare was desired; could the owner in such a case re-erect his buildings to the old height? The Professor thought he could not do so if the prescribed open space at the rear would be impinged upon. Further, it was enacted that most buildings exceeding 30 feet in height and having a parapet must be provided with dormer window or some proper means of access to the roof. If there were no parapet, as in the common case of a detached house with gable ends, must access still be provided to the roof? Under section 43, before commencing to erect new domestic dwellings on an old site, plans had to be prepared showing the extent of the previously existing domestic building in its several parts, which had to be submitted to the district surveyor that he might certify as to their accuracy. The owner might then proceed to erect the intended domestic building, but he must so build that no more land should be occupied by the newly-erected building than was occupied by the one previously existing, as so certified. If the building owner were to deviate from the old plan, he had to apply to the Council, and if dissatisfied with their decision, to the Tribunal of Appeal. Supposing the frontage of the new building were set back, might the open space previously existing at the back be reduced in area to the extent of the land in front left open that

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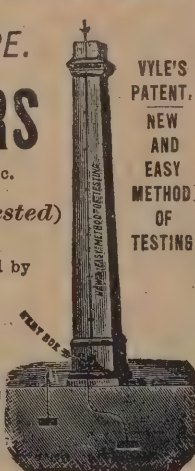
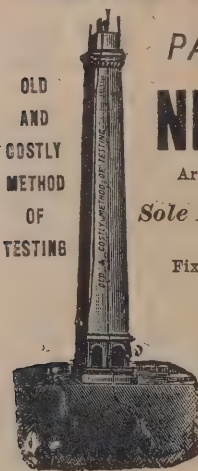
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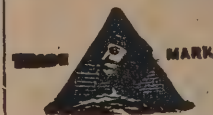
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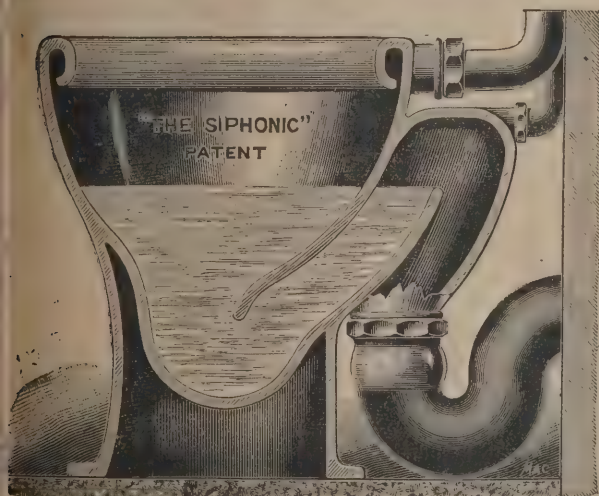
was previously built over? The section was not clear upon this point, and likewise as to where the diagonal line was to be drawn from in cases covered by the section. The latest point raised was whether party-walls above a certain height ceased to be party-walls. The County Council fought the case, and it was decided against them, but the decision of the High Court was based on the legal interpretation of the Act of forty years ago. The appeal and judgment might, therefore, be regarded as an utter waste of time. With regard to the taking down of a building, a very curious point relating to a party-wall had been decided in the Thames Police Court. A fire occurred in some warehouses in Church Street, Minories, and one of the buildings, of which only a third had been injured, had been rebuilt. The adjoining warehouse, of which the greater part was destroyed, was left unrepaired, and the building owner of the first warehouse gave notice of an intention to reinstate the wall. As the party-wall had not been destroyed to an extent of one-half its area, it was admitted that it could not be dealt with under section 208; but the district surveyor and County Council sought to treat the party-wall as a portion of the warehouse which had been nearly destroyed. The magistrate held that, since it was not sought to rebuild the latter warehouse, and the party-wall had not been taken down to the extent of one-half, the wall could be reinstated without regard to the more stringent requirements of the new Act. A fortnight after the decision was given, the building owner of the burnt-out warehouse gave notice of his intention to rebuild, but declined to deal with the party-wall under the new Act. The magistrate again decided against the district surveyor on the ground that section 208 ousted the provisions of section 5, subsection 6. It would be seen, therefore, that the difficulties of district surveyors under the Act were very great, for within the last three months there had been four decisions against the enforcement of the Act because it was not so framed as to be clearly understood of the people.

Mr. Frederick Waller, district surveyor, said he could not agree with Mr. Banister Fletcher as to the hardship of making objection to the builders' notice and to the drawings. He had on one occasion to fight a case against an architect until it reached the House of Lords, and when the case was decided against the architect the point was raised that objection should have been taken earlier. As regards the Tottenham Court Road case, he did not disapprove of the decision, as to have upheld what he deemed to be the letter of the law would have been a peculiar hardship to

Messrs. Shoolbred, who had practically conceded what was required. They had reduced the sleeping accommodation, and had undertaken to provide fireproof floors and better staircases. As the proposed premises contained a few offices and rooms to be used for writing, Sir John Bridge decided that the building was of the warehouse and not of the domestic class. His own opinion was that unwarranted importance was given to the decisions of the magistrates in building cases. If a building owner wished to evade the Building Act he had only to instruct one or two counsel to so begot the magistrate with references to numerous clauses as to compel him to take refuge in what he termed a "common-sense aspect of the matter," and a decision so arrived at was quoted by the professional papers as of great importance. He maintained that the diagonal line of $63\frac{1}{2}$ deg. was neither easily explicable to a layman nor was it mathematically accurate. A better rule would have been to have prohibited the raising of any building higher than twice the depth of the open space at back. Another difficult point was the question of concrete walls. From the first schedule it seemed they must be one-third thicker than walls of brick. There seemed no power to prevent the use of a building for purposes other than those originally declared, and he feared there would be a good deal of evasion of the Act carried out under the guise of conversion. The Act would, without doubt, have to be amended and simplified.

Mr. H. Phillips Fletcher considered that the rule as to setting back walls under section 41 would lead to much imperfect construction, to increased cost, sacrifice of area of rooms, and more danger from fire. The determination of the County Council not to allow district surveyors hereafter appointed to practise as architects had been to reduce the number of candidates very largely, and would lead to the appointment of an inferior class of officials.

Mr. Solomon, in summing up the discussion, said the wonderful Act they had been discussing contained three bad features—inequality, vagueness and incompleteness. Under it a shop having a superficial area of 1,000 cubic feet—that is, one of 50 feet depth by 20 feet frontage—had to be provided with fire-resisting floors and other costly requirements. Many of the clauses would be found to be contrary to the intention of the framers. Lately he remonstrated with a district surveyor who refused to consider plans unless inked in; but, on reconsideration, he wrote to the surveyor, acknowledging that his rule not to pass drawings in pencil was a wise safeguard against



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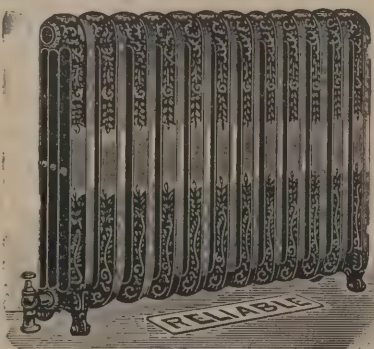
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the tricks of jerry builders. The County Council had prudently reserved to themselves great discretionary powers, and it was clear that district surveyors had wide scope for option as to insistence on the words of the Act. Under schedule 2 no thicknesses were provided for concrete walls, and it was a question whether a wall might not be raised between wire network only $1\frac{1}{2}$ inches thick without infringing the Act. There was considerable friction between the working by the County Council of the Building Act and by the vestries of the Public Health Act of 1891, and he suggested that the Institutes of Architects and Builders should endeavour to obtain a power to appeal under the Public Health Act to some tribunal.

Professor Banister Fletcher, in reply, said it was quite clear that under the Act objection should be raised on the notice and not on the drawings. The thicknesses of walls constructed of concrete was provided for in the first schedule, part ii. sub-section 13, which stated that "the thickness of any wall, if built of materials other than those specified, should be deemed to be sufficient if made of the thickness required for brickwork." The change of user of a building might hereafter give trouble to district surveyors, and required close attention. The experiences of the new Tribunal of Appeal would not be an unmixed evil, for men would hesitate before going before it. The district surveyors had no interest in worrying the public; they simply had to administer the Act fairly. It had been said that the fees had gone up in the districts where the surveyors were appointed under the new rule prohibiting private practice, the reason being that those surveyors had a greater interest in getting the full fees out of their district.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

THE members of this Society, on Saturday, April 6, visited the works of the Great Wheel that is now in course of construction at West Kensington. The wheel is 270 feet in diameter, and the top car will be 300 feet from the ground. The axle is made up of inch plates, is 7 feet 6 inches in diameter, and weighs 53 tons. It will run in cast-iron bearings lined with white metal. The towers which carry the bearings of the wheel are of steel, and consist of eight columns, 4 feet square and 180 feet high, and weigh 700 tons, the weight of the wheel being 800 tons. The speed it is proposed to drive the wheel is one revolution in twenty-five minutes, stopping five times for

passengers. The cars attached to the wheel will be forty in number, 20 feet in length by 9 feet by 9 feet, and to judge from the sample shown will be exceedingly comfortable places to spend twenty-five minutes in. The cars will be suspended from the periphery of the wheel. The points of suspension of these are situated near the top, so that the floors of the cars will be always in a horizontal position. The wheel is constructed on the principle of the modern bicycle wheel, namely, with spokes in tension, and not in compression. The whole of the main structure is of steel. The wheel will be turned by means of an endless chain driven by two horizontal engines, which are coupled up with the mechanism, as required, by two of Lindsay's spring clutches. The engines and boilers are in place and ready for work. The wheel was designed by Mr. W. B. Basset, and the resident engineer is Mr. C. F. Hitchins, who kindly showed the party over the works. The members then visited the site of the forthcoming Indian Exhibition, by permission of Mr. Collard, the architect, and were shown the French Hippodrome (a work of considerable size), a large roof in course of construction by Mr. Handyside, and a newly-built mosque for the use of the Mohammedan attendants who will be at the exhibition. A vote of thanks to Mr. Hitchins, proposed by the president, Mr. C. T. Walrond, and seconded by Mr. E. H. G. Brewster, hon. secretary, closed a most interesting visit.

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		Average.
Silica	20 to 28 per cent.	24 per cent.
Oxide of iron and alumina	8 to 14 "	11 "
Lime	58 to 65 "	61.5 "

* A paper read by Mr. D. B. Butler before the Society of Engineers on April 1.

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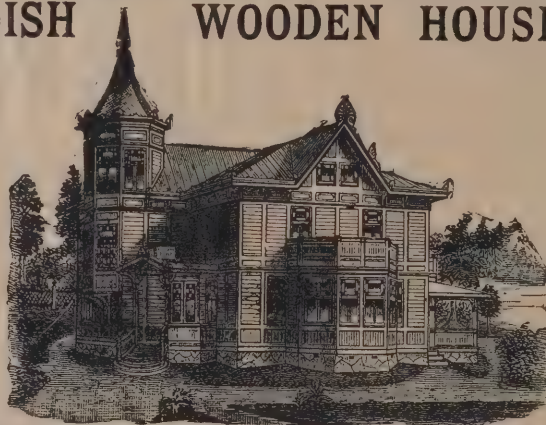
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Portland cement can be manufactured from any raw materials containing the requisite chemical components, but of course its economical production depends entirely upon the ease with which these raw materials lend themselves to a thorough mechanical admixture before being converted into a chemical compound by the agency of heat. There are natural formations containing the constituents of uncalined Portland cement, such as are found in Cambridgeshire and elsewhere, but generally speaking these formations are not altogether to be depended on for uniformity, and the most reliable results are obtained from those materials which require mixing in certain proportions, so as to contain the requisite amount of the proper chemical ingredients. The materials most generally used in this country, and those which are most economically treated, are the chalks and clays found in the neighbourhood of the lower reaches of the Thames and Medway, and although the industry is extensively carried on in other parts of the country, it may be taken for granted that the greater part of the cement manufactured in England is made from the materials in the district referred to.

The properties appertaining to cement, which it is necessary to ascertain in order to arrive at an opinion of the constructive value of a given sample, are the following:—

1. Soundness, viz. freedom from destructive agencies within itself, or, as it is generally termed, "blowing."
2. Fineness of grinding.
3. Strength, cohesive and adhesive.
4. Time of set.

The soundness of a cement is a most important point, as it is evident that no matter to what fineness it may be ground, or what strength it may develop at the earlier dates, if it eventually expands and disintegrates it is not only of no value as a constructive material, but it is at once converted into a destructive agent. On this point the author would like to quote the opinion of his late principal and colleague, Mr. Henry Faija, an opinion which he fully endorses, viz. that if a cement is sound, it is almost invariably strong enough for any work in which it may be used. The soundness of a cement generally used to be considered as satisfactory if a pat, gauged with the minimum of water, and placed on a glass or other non-porous slab, showed no cracking or lifting at the edges at the expiration of seven days, either when plunged imme-

diately into water, placed in water as soon as set, or left in the air. The author's experience is that this test is not altogether reliable, as he has known instances in which pats, treated as above, are perfectly sound and good at the expiration of seven days, and the briquettes also show a good tensile strength, but when kept for a period of twenty-eight days both pats and briquettes have been found to show signs of disintegration. He has also known cements give perfectly satisfactory results at the expiration of twenty-eight days, and even then deteriorate at the end of a longer period. The most reliable test for the soundness of cements, in the author's opinion, is that which was introduced a few years ago by Mr. Faija, of which a full description is given in the paper read before the Society in 1885. It essentially consists in subjecting a freshly-gauged pat to a moist heat of 100 deg. Fahr. until set, and afterwards placing it in warm water of 115 deg. Fahr. for the remainder of the twenty-four hours. The author has had a large experience of the apparatus for carrying out this test during the past ten years, and if a pat treated therein shows no signs of "blowing," the cement may be used with perfect confidence. If, on the contrary, it shows cracks or other signs of unsoundness, it is a danger signal, and the utmost caution should be used before sanctioning its use in any constructive work. Of course the indications of unsoundness may be due to the extreme freshness of the sample, in which case it is advisable to lay it out to cool for a few days before finally deciding as to its use. If at the end of that period its objectionable characteristics have disappeared, it may be assumed that it would become fit for use with a little aeration; but if, on the other hand, it still "blows," it should not be used on any account, or, at all events, not until sufficiently aerated to show no signs of expansion when treated as described.

The hot test of Deval, in which the cement is immersed in water at 176 deg. Fahr., seems to the author to err on the side of severity, as there are very few cements manufactured at present which will bear being subjected to that test, unless, indeed, they have previously attained considerable age. Although it may be considered perfectly safe to use any cement that passes this ordeal satisfactorily, it is a little hard on the manufacturer to reject a sample that will not pass the test; for it is very certain that many cements which have been used, and have given perfectly satisfactory results in practice, would have been rejected if the Deval test had been insisted upon.

The fineness of grinding of a sample largely determines its

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usefulness as a constructive material, as it is well known that the finer a cement is ground the better will be the results obtained from it when mixed with sand or aggregate. There is a growing demand for finer cement, and doubtless this is a tendency in the right direction, but in specifying finer cement the user must not lose sight of the fact that finer cement means extra wear and tear on grinding machinery and reduced output, and therefore if an extra fine cement is required he must expect to pay a somewhat higher price. At the same time, with other methods of grinding, there is no doubt that many manufacturers are able to keep pace with increasing demands for smaller residues. Looking back at some old testing books fifteen years ago, 20 per cent. on a 50 sieve was not an uncommon residue to find recorded; eight years ago it had been reduced to 10 per cent., and now many manufacturers ordinarily grind down to 5 per cent.

Various kinds of edge-runner mills in lieu of mill-stones have lately come into considerable use for grinding cement, and no doubt some of them perform their work economically. Apart from the economy, however, the fact remains that cement thus ground rarely contains the same proportion of impalpable powder as that ground by stones. As it is this impalpable powder which is the essential feature of the cement, this is an important matter. It is very easy to imagine a cement thus ground which may all pass through a sieve of the meshes ordinarily used in testing, and yet may contain scarcely any flour. A cement ground by mill-stones in the ordinary way, and leaving 10 per cent. on a 50 by 50 sieve, is generally equal in cementitious properties to one ground by edge-runner mills, leaving about half that residue. It therefore seems to suggest that, instead of specifying not more than a certain amount of coarse residue, the amount of impalpable powder, or "flour," to be determined by elutriation or other means, should be specified.

A matter which is often overlooked in testing a cement in this particular is the thickness of the wire of which the gauze is composed. It is obvious that if the wire of a sieve having the specified number of holes to the square inch is abnormally thick, the size of the hole will thereby be reduced and *vice versa*, and in some instances may cause the rejection of a cement which would otherwise pass the specification.

The strength of a cement is generally ascertained by means of its resistance to a tensile strain, as being the easiest and most convenient test to carry out. It is doubtful, however, if in practical use cement is ever subjected to this strain, and it

is therefore only a comparative test. The most desirable feature to be observed in testing a cement for tensile strength and one to which too much attention cannot be given, is the increase in strength of a given sample between the different dates of testing. It is obvious that a sample which develops a moderate strength at the earlier date and continues to increase steadily at each subsequent date, is preferable to one which attains 90 per cent. of its strength at the seven days and its full strength at twenty-eight days, while at the longer periods it shows a tendency to decrease. In the present methods of testing, the results obtained depend very much upon the skill of the operator, and therefore a considerable allowance should be made if the testing is to be carried out by inexperienced persons.

The author well remembers one occasion a few years back when a dispute arose as to the quality of a consignment. He visited the works in company with representatives of the manufacturer and contractor, and samples were duly drawn from the bulk and taken to the works office, to be tested in the presence of the officer in charge. The operator in this instance was an ordinary bricklayer, whose chief idea seemed to be that the water should contain a certain percentage of cement in contradistinction to the generally recognised practice, that the cement should be mixed with a certain percentage of water. With the aid therefore of a whitewash brush and a large trowel, the cement was reduced to the consistency of a thin cream and poured into the moulds. Needless to say there was not much difficulty in understanding the reason of its not having passed the specification, especially as in this instance the sample was very slow setting.

The correct amount of water to be used in gauging cement varies greatly, and no hard and fast rule can be laid down on this point, each cement requiring a quantity peculiar to itself, depending largely on its fineness and setting properties. In the author's testing-room the correct amount of water is considered to be added when by ramming and shaking the cement into the moulds the moisture just comes to the surface of the briquette. If more water than this is added an inferior result is obtained, while if a less quantity is used, crystallisation has been set up without any possibility of its being completed, on account of insufficient water, and therefore in this respect also an inferior result is obtained. Objections have sometimes been made with respect to beating and ramming the cement into the moulds for the purposes of testing, but the author's contention is that the object of a laboratory test is always to

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obtain the best results from the cement under examination, and that being so all reasonable methods are allowable for obtaining this object. The disposition to specify excessive tensile strains at seven days is not so prevalent as it was a short time back, and this is perhaps a point for congratulation. Experience shows that high strains generally require high percentages of lime, and to get the high strains sometimes asked for it is absolutely necessary to "lime" up to the verge of "blow." In such cases extreme care is necessary in the manufacture, and only those acquainted with practical cement making can appreciate the very small margin of lime allowable between a sound cement of high tensile strain and an unsound one, the latter bringing all sorts of unpleasantness in its train.

The time of set of a cement is only of importance where it is either abnormally quick or abnormally slow, except of course in special cases such as tidal work, where it is desirable that cement placed in position at low water should be sufficiently set to prevent the rising tide separating it from the aggregate. The most important point in the set of a cement is what is generally known as its initial set, i.e. when hardening or crystallisation commences, as when this point is reached the cement should be in its allotted position, and allowed to remain without being disturbed, otherwise the crystallisation will be arrested and the ultimate strength of the material weakened. The time of initial set should not give any trouble in practice, as it is a very simple matter for the clerk of works or the foreman in charge to make a small pat and, noting the time when hardening commences, take precautions accordingly.

Temperature and climatic influences play a very important part in the setting of cement. The author's attention was particularly drawn to this matter a very short time ago. A shipment of cement which had been tested in the ordinary course before leaving England satisfactorily passed the requirements of the specification as to set, but on reaching its destination in a hot climate the engineer in charge complained that it set too quickly. This induced the author to institute a series of experiments to ascertain the comparative time of set at different temperatures, the results of which are given in Table I. In each series of experiments an exactly similar amount of water was used for gauging, the water being of the same temperature as the chamber in which the pats were placed, and to insure a moist atmosphere the bottom of the vessel was lined with a damp cloth. The cements were not in any way chosen specially for this experiment, but have been arranged in the table according to their time of initial set. The difference in setting is

distinctly marked at each temperature, more especially between 40 deg. and the normal 60 deg.

TABLE I.

Influence of Temperature on the Setting of Portland Cement.

Sample No.	Temperature Fahrenheit.							
	100°	80°	60°	40°	100°	80°	60°	40°
	Initial set in minutes.				Set hard in hours.			
1	1½	4	6	13	1½	1½	2	2½
2	3	5	6	8	1	1½	1½	2½
3	4	10	15	20	0½	0¾	1½	6½
*4	5	9	15	30	0½	0¾	1	6
5	6	10	14	25	1	1½	2	2½
*6	7	12	15	20	1¾	2	2½	2½
*7	9	10	15	17	3½	6	7	12
8	10	15	35	40	0¾	1	1½	1¾
9	11	15	20	57	3	5	6	10
10	11	13	15	30	2½	3	3½	6
11	19	32	60	120	3	6	7	15
12	15	35	70	360	3½	6	7	22

* Contain a considerable admixture of Kentish rag.

A test that is sometimes asked for, and which perhaps represents the more usual strain to which cement is subjected, is its resistance to crushing. Generally speaking, the crushing strain of a cement is from six to nine times its resistance to a tensile strain. It is, however, rather an inconvenient method of testing; and as a comparative test the results are but little superior to the tensile strain. Added to this the opportunities of error are much larger, as, if the surface of a cube at the point of contact is not perfectly true, the pressure comes on to the highest portion first, and thus crushes it in detail.

Provided the foregoing points are satisfactory, the colour of a sample does not matter so much, except of course for work that is exposed to view, when it should be of a cold blue-grey. This blue-grey colour may generally be taken as an indication of sufficient calcination, while if the sample has a yellowish tinge, it indicates the presence of underburnt cement, either on account of the general calcination having been insufficient, or else that the picking of the clinker to eliminate the unburnt

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portions has been carelessly carried out. If this yellow colour exists to any great extent, the presence of uncombined lime would probably cause it to give indications of expansion when treated in the Faija apparatus already mentioned.

The weight per bushel of a sample is now not often specified, as it is not much of a guide to the user as to the quality of the cement. To the manufacturer it may perhaps be of use, as it is an indication to him of the amount of calcination to which his cement has been subjected. If the density of a sample is required it is better to determine it by means of its specific gravity, which is not affected by the fineness to which a sample is ground.

The chemical analysis of a Portland cement is often of great corroborative value in estimating the properties of a sample, but the treatment which the raw materials have undergone during the process of manufacture so largely affects the resulting cement that an analysis should never be relied on by itself. Its chief use is in detecting the presence of an excess of any deleterious constituent, as well as in determining the amount of useful components, and this knowledge, in conjunction with the mechanical tests, enables an accurate opinion to be formed as to the future behaviour of the sample. Generally speaking, however, chemical analysis is of more value to the manufacturer than the user, as knowing the exact treatment to which the raw materials have been subjected, he is able to judge with accuracy what characteristics they should develop in mechanical testing and to regulate his mixtures accordingly. The importance of analysis is now generally recognised by manufacturers, and most firms, if they do not employ a resident chemist, at all events recognise the importance of having periodical analyses both of their raw materials and finished cement.

The uses of Portland cement are so numerous that, in a paper of this description, it is only possible to glance at them in passing. Perhaps the most valuable property is its power of setting and hardening under water, which combined with its great strength, renders it peculiarly adaptable to pier and harbour work, where it often proves an indispensable material to the modern engineer. The theory that sea-water affects cement prejudicially caused considerable excitement a few years ago when the failure occurred at Aberdeen, but subsequent experiments proved that with sound cement, properly manipulated, the engineer has nothing to fear from the effects of sea-water. That sea-water does attack unset Portland cement to a certain extent, the author has since proved by direct experiment. His experiments, however, seem to point

to the conclusion that it is only attacked on the surface, where it is directly exposed to the action of the sea-water, and unless a concrete is extremely porous and thus allows the sea-water to percolate freely through it, it should not have any detrimental effect. Moreover, the attacked portion in a neat cement does not extend above a quarter of an inch from the surface, the interior being totally unaffected, and although it continues for some time soft and unset, it eventually acquires a certain hardness, and forms a protective skin against further attack. It would therefore seem that slow-setting cements are not so suitable for sea-water work as the quicker setting varieties, the former giving more opportunity for the attack of the sea-water.

(To be concluded.)

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

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- 6136. William Sykes, for "Improvements in street-gullies."
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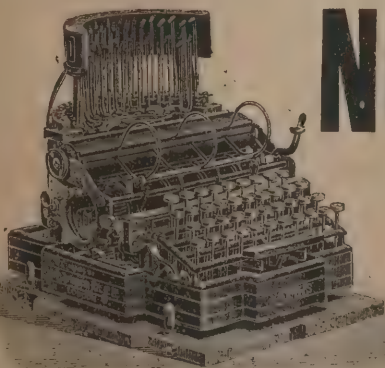
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NEWCASTLE-ON-TYNE.—April 23.—For the Erection of the Superstructure of the Extension of the City Asylum. Mr. John W. Dyson, 18 Grainger Street, Newcastle-on-Tyne.

NOTTING HILL.—April 22.—For Painting, Colouring, Cleansing and Repairing Infirmary. Mr. H. S. Dudman, Guardians' Office, Northumberland Street, Marylebone Road, W.

PORTRAN.—April 19.—For Building Residence. Messrs. A. Scott & Son, Architects, Drogheda and Navan.

ROCHESTER.—April 25.—For Building Workmen's Dwellings. Mr. J. W. Nash, Architect, 7 Medway Terrace, Rochester.

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SLAITHWAITE.—April 22.—For Building Warehouse and Three Shops. Mr. J. Berry, Architect, 9 Queen Street, Huddersfield.

SOMERSET.—April 30.—For Additions, &c., to Bleadon and Uphill Railway Station. Mr. G. K. Mills, Secretary, Paddington Station, W.

SOUTHSEA.—April 19.—For Building Three Shops and Dwelling-houses. Mr. Alfred H. Bone, Architect, Cambridge Junction, Portsmouth.

SOUTHGATE.—April 19.—For the Supply and Delivery of 1,500 Tons (more or less) of Hand-broken Granite, the carting thereof from the railway stations to various points in the district, Glazed Fireclay Pipes, Pipes with Special Watertight Joints, Portland Cement, Iron Castings, &c. Mr. W. M. Ellenor, Council Offices, Palmer's Green, N.

SOUTHWARK.—April 26.—For Repairing and Repainting Roof over North Side of Borough Market. Messrs. James & Son, 29 Trinity Square, S.E.

STAINBURN.—April 25.—For Restoration of Church. Mr. C. Hodgson Fowler, Architect, The College, Durham.

STEEPLE CLAYDON.—April 23.—For Building Schools, &c. Messrs. George Bennett & Sons, Surveyors, Buckingham.

STOCKPORT.—April 22.—For Constructing Brick Sewers, Cast-iron Culverts, &c. Mr. A. M. Fowler, 1 St. Peter's Square, Manchester.

SUNDERLAND.—April 25.—For Casual Wards, Porter's Lodge and Receiving Wards. Messrs. Wm. & T. R. Milburn, Architects, 35 West Sunnyside, Bishopwearmouth.

TOLLESBURY.—April 22.—For Building Board Schools. Mr. P. M. Beaumont, Architect, Maldon.

TUNBRIDGE WELLS.—April 26.—For the Erection of a Post Office. Messrs. Lee & Sons, 35 Craven Street, W.C.

WALTHAMSTOW.—April 26.—For Supply of 1½-inch Broken Granite. Mr. G. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow.

WEST HAM.—May 7.—For Gas Engineering and Fittings required at the Credon Road Schools, Upton Park, and Pupil Teachers' Centre, Russell Road Schools, Custom House, E.,

now in Course of Erection. Messrs. J. S. Newman & Jacques, 2 Fen Court, E.C.

WEST HAM.—May 14.—For Two Beam Pumping-Engines, each about 250 Indicated Horse-power; Two Centrifugal Pumps and Engines, each about 350 Indicated Horse-power; Four Boilers, each 30 Feet in Length by 7 Feet 6 Inches in Diameter; also Alterations to Existing Centrifugal Pump, Engine and Boilers and Other Works. Mr. Lewis Angell, Town Hall, Stratford.

WELLINGBOROUGH.—May 7.—For Execution of Sewage Works, Consisting of 18-inch Outfall Sewer, Screening Chamber, Storage Tanks, Engine House, Boiler House, Coal Store, Fitting Shop, Chimney and Pumping Plant, 12-inch Cast-iron Pumping Main, Irrigation Mains, and Fittings, &c., for the Necessary Irrigation Works. Mr. J. T. Parker, 29 Church Street, Wellingborough.

WESTMINSTER.—April 30.—For Rebuilding West Block of Workhouse. Messrs. J. Waldram & Son, 13 Buckingham Street, W.C.

WIMBLEDON.—April 23.—For Caretaker's House at Recreation Ground. Mr. W. H. Whitfield, Broadway, Wimbledon.

WINTERBORNE.—April 23.—For Rebuilding Coach and Horses Public House. Messrs. Crickmay & Sons, Architects, 77 St. Thomas Street, Weymouth.

WINTON.—April 22.—For Building Schools. Messrs. Lawson & Donkin, Architects, Yelverton Chambers, Bournemouth.

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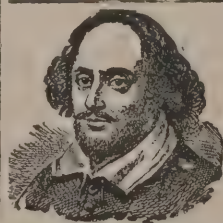
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Clayton, Son & Co., Limited, Leeds, gasholder and tank	£2,270	0	0
J. F. Blakesley & Co., Ravensthorpe, ex-hauster and steam-engine	194	0	0
G. Davies, Abergavenny, two boilers	160	0	0
J. Coates & Co., London, governor and connections	89	0	0

AYR.

For Repaving Sandgate Street. Mr. JOHN EAGLESHAM, Town Surveyor.

J. Coghill & Son, Pollokshields	£1,020	11	3
A. Stark, jun., Kirkintilloch	1,003	19	2
H. McCann, Glasgow	831	3	4
R. Stevenson, Ayr	773	11	0
R. C. Brebner, Edinburgh	768	11	7
C. McANDREW, Ayr (<i>accepted</i>)	663	11	3

BARNSELY.

For Erection of Salvation Army Premises in Wellington Street, Barnsley, Yorks, for the Barnsley Citadel Co., Limited. Mr. ALEX. GORDON, M.S.A., Architect, 101 Queen Victoria Street, London, E.C.

J. K. Taylor, Barnsley	£1,991	0	0
J. J. Smith & Co., London	1,849	0	0
A. Clough, Barnsley	1,792	0	0
E. Gilder, Luton	1,720	0	0
T. Morgan, Wood Green	1,585	0	0
Rhodes Bros., Shipley	1,562	0	0
H. Burrows & Son, Barnsley	1,507	5	0
H. & F. TURTON, Stairfoot, Barnsley (<i>accepted</i>)	1,480	0	0

BELFAST.

For Construction of Donegall Park Outfall Sewer Works, for Mr. Robert Dunlop, Chichester Park. Mr. J. H. H. SWINEY, Engineer, 83 Royal Avenue, Belfast.

J. Graham, jun., Dromore	£561	15	6
J. Ross & Son, Belfast	405	0	0
J. McLarnon, Belfast	358	0	0
M. GREEN, Belfast (<i>accepted</i>)	350	0	0

BRADFORD.

For Construction and Delivery of Two Steam Dynamos for Electricity Works, Bolton Road, for the Corporation of Bradford.

SIEMENS BROS. & Co., Limited, London (*accepted*).

BRIDGNORTH.

For the Erection of New Bridgnorth and South Shropshire Infirmary. Mr. E. C. H. MAIDMAN, Architect, 1 Comely Bank Avenue, Edinburgh.

G. Carr, Wolverhampton	£6,064	0	0
J. Jones & Sons, Sedgley	6,000	0	0
H. Gough, Wolverhampton	5,898	0	0
H. Wilcocks & Co., Wolverhampton	5,764	0	0
Treasure & Sons, Shrewsbury	5,672	0	0
R. Bowen, Leamington	5,514	0	0
Bickerton & Maddox, Shrewsbury	5,427	0	0
R. Thompson, Kidderminster	5,335	0	0
W. Bate, Bridgnorth	5,247	0	0
A. Rogers, Wellington	5,203	0	0
J. Guest & Sons, Stourbridge	4,687	0	0
R. MERTON HUGHES, Birmingham (<i>accepted</i>)	4,368	0	0

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For Building House and Stables, for Mr. E. H. Vincent. Mr. W. F. TAYLOR, Architect.

G. H. GIBSON, High Wycombe (<i>accepted</i>)	£1,830	0	0
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For Erection of Buildings, for the West Cowes Steam Laundry Co. Mr. S. E. TOMKINS, Architect, West Cowes.

H. C. Day	£1,212	0	0
Barton Bros.	1,158	10	0
Tarrant	1,137	0	0
Thomas	1,097	0	0
Meador	1,094	0	0
BALL & SON (<i>accepted</i>)	1,089	0	0

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J. Wilson, Nuneaton	3,698	0 0
A. Wincott, Coventry	3,529	0 0
S. B. Woodward, Nuneaton	3,495	0 0
A. Jeffcote, Hinckley	3,400	0 0
Greaves & Farmer, Hinckley	3,365	0 0
G. Hewitt, Leicester	3,318	0 0
Moss & Son, Loughborough (recommended for acceptance)	3,265	0 0

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H. Potter, Chelmsford	335	0 0
E. Saltmarsh, Chelmsford	320	0 0
J. Rayner, East Hanningfield	305	0 0
J. Gozzett, Maldon	298	0 0
Beckett Bros., Chelmsford	289	17 6
Ager & Claydon, Boreham	288	0 0
A. WOODWARD, Stock (accepted)	276	0 0

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For Roads, Sewer, Surface Drains, &c., Coed-y-Brain Estate, Limited, Llanbradach, for Captain de Winton. Mr. C. TELFORD EVANS, Architect, 14 Queen Street, Cardiff.		
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T. Rees, Ely	1,200	0 0
B. Evans, Cardiff	939	8 3
T. Harris, Cardiff	913	5 5
H. Knill, Cardiff	897	6 8
T. W. Davies, Cardiff	776	14 3
R. J. Mathins, Porth	770	13 7
E. H. Page, Cardiff	755	15 7
J. Mackay, Newport	720	10 0
BARNES, CHAPLIN & Co, Cardiff (accepted)	720	14 7

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Rice, Elmswell	£3,700	0 0
Grayston, Ipswich	3,575	0 0
Death, Bildeston	3,498	13 6
West, Chelmsford	3,495	0 0
Parkington, Ipswich	3,483	0 0
Bennett, Ipswich	3,465	0 0
Girling, Ipswich	3,445	0 0
Gibbons, Crowfield	3,380	0 0
Youngs, Norwich	3,318	0 0
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THEOBALD, Needham (accepted)	2,861	0 0

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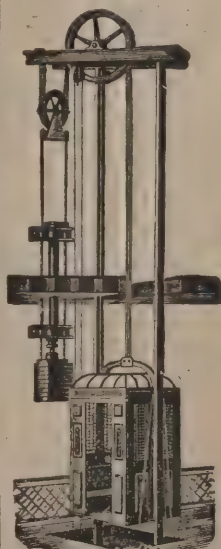
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Gilbert & Gabbitass, Nottingham	1,800 0 0
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Wheatley, Nottingham	1,737 0 0
Cuthbert, Nottingham	1,706 0 0
Hodson & Son, Nottingham	1,695 0 0
J. LEWIN, Netherfield (accepted)	1,670 0 0
Architect's estimate	1,750 0 0

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For Rebuilding 40 Northbrook Street, Newbury, for Mr. J. James.	
E. C. JAMES, Newbury (accepted)	£649 0 0

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For Laying Concrete Floor and Making Alterations at Premises in Roden Street, for Messrs. Coombe & Co., Limited. Mr. W. D. PRATT, Architect, Long Row, Nottingham. Quantities by Architect.	
J. G. Thomas	£380 0 0
Wilkinson & Co.	361 0 0
G. T. Lovett	360 0 0
F. Messom	313 0 0
Gilbert & Gabbitass	290 0 0
A. G. Bell	286 0 0
T. Barlow	263 8 7
R. Fisher	259 17 6
R. Simpson	250 0 0
J. Attenborrow	229 0 0
F. EVANS, Basford, Nottingham (accepted)	220 10 0
J. Fields	196 8 8

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Accepted Tenders.

J. Grice, Ulverston, excavator, builder, brick-layer, slater and mason	£211 16 0
J. Bateman, Swarthmoor, joiner	124 7 0
P. Burns, Ulverston, plasterer	24 0 0
T. Braithwaite, Ulverston, painter, plumber and glazier	14 0 0

PLYMOUTH.

For Alterations and other Works at Free Public Library, Plymouth. Mr. H. J. SNELL, Architect, 13 Courtenay Street, Plymouth.	
J. Berry, Plymouth	£1,875 0 0
J. Partridge, Plymouth	1,848 0 0
S. Harvey, Plymouth	1,833 0 0
J. Finch, Plymouth	1,820 0 0
Tozer, Plymouth	1,815 0 0
T. May, Plymouth	1,797 0 0
Jenkin & Son, Devonport.	1,769 0 0
W. H. Lethbridge, Plymouth	1,744 0 0
Matcham & Co., Plymouth	1,741 0 0
A. Lethbridge, Plymouth	1,693 0 0
Foot, Plymouth	1,620 0 0
Wakeham Bros., Plymouth	1,608 0 0
Blake, Plymouth	1,551 0 0
Blackell, Plymouth	1,545 0 0
A. Andrews, Plymouth	1,530 0 0
Stanlake, Plymouth	1,525 0 0
W. J. Goad, Plymouth	1,495 0 0
TREVENA, Plymouth (accepted)	1,462 0 0

PONTYPRIDD.

For Building Three Shops, &c., Taff Street, Pontypridd, for Mr. Edgar Fennell. Mr. F. GIBSON, Architect, Midland Bank Buildings, Pontypridd.	
H. Powell, Pontypridd	£1,644 9 8
Williams & Co., Pontypridd	1,589 0 0
W. Lissaman, Chipping Campden	1,528 0 0
A. Richards, Pontypridd	1,505 0 0
Griffiths & Co., Pontypridd	1,492 3 9
William & James, Pontypridd	1,403 12 11
H. Morgan, Cardiff	1,382 0 0
Jones & Co., Gloucester	1,276 0 0
J. C. RICHARDS, Pontypridd (accepted)	1,235 0 0

POOLE.

For Altering and Completing Cycle Track in Public Park, for the Council. Mr. JOHN ELFORD, Borough Surveyor.	
T. C. Rigler, Longfleet, Poole	£95 10 0
H. C. Brixey, Newtown	85 9 0
G. T. Budden, Newtown	79 10 0
S. SAUNDERS, Branksome (accepted)	49 10 0

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ARCHITECTS, BUILDERS,
and MANUFACTURERS should
all read top Advertisement on
page xiii.

READING.

For Bridge Works, for the Berkshire County Council.

Contract No. 1.—Brick Bridge at Aldermaston.

Tucker	£262	0	0
Allen	215	12	6
Carter	197	3	6
James	164	0	0
JOHNSON, Wolverhampton (accepted)	151	15	0
Surveyor's estimate	226	9	0

Contract No. 2.—Abel Bridge, Brimpton—Steelwork.

Tucker	435	0	0
Allen	433	0	0
Elms	376	0	0
Horsehay Company	369	14	8
Newton, Chambers & Co.	369	10	0
Caffin	365	10	0
Cochrane & Co.	353	0	0
Pitts	352	4	8
Shewell & Co.	330	17	2
Peirson & Co.	323	17	10
Engineering Supply Company	306	3	9
Rubery & Co.	303	19	7
Lysaght	299	17	9
Ellis	295	17	6
J. J. Robins (too late)	295	10	7
Hill & Smith (too late)	291	14	7
Finch & Co.	291	8	9
Tildesley & Co.	288	0	0
Dyne, Steel & Son	280	0	0
Brettell	277	6	0
Cleveland Bridge Company	271	6	0
Barry & Higham	270	0	0
WOODALL, Dudley (accepted)	260	9	0
Surveyor's estimate	369	8	4

Contract No. 3.—Abel Bridge, Brimpton—Foundations.

Tucker	545	0	0
Caffin	492	11	11
Elms	479	0	0
Allen	469	0	0
Johnson	465	0	0
T. JAMES, Midgham (accepted)	432	0	0
Surveyor's estimate	504	12	10

READING—continued.

Contract No. 4.—Bagshot Bridge—Steelwork.

Allen	£156	0	0
Tucker	140	0	0
Cochrane & Co.	139	0	0
Rubery & Co.	137	8	11
Elms	132	0	0
Newton, Chambers & Co.	131	10	0
Horsehay Co.	130	14	5
Engineering Supply Co.	129	15	8
Finch & Co.	126	1	7
Tildesley & Co.	122	0	0
Shewell & Co.	120	2	5
Peirson & Co.	118	14	5
Pitts	118	11	5
Dyne, Steel & Son	114	14	6
Woodall	108	11	3
Lysaght, Limited	108	2	3
Cottrell & Co.	105	2	9
Hill & Smith (too late)	103	2	8
J. J. Robins (too late)	102	5	4
Ellis	101	12	0
Barry & Higham	98	10	0
Brettell	96	0	0
CLEVELAND BRIDGE & ENGINEERING CO., Darlington (accepted)	84	8	0
Surveyor's estimate	101	1	6

Contract No. 5.—Bagshot Bridge—Foundations.

Tucker	350	0	0
Hoskings	253	0	0
Elms	219	0	0
Woolridge & Son	204	7	0
Allen	195	0	0
Surveyor's estimate	223	1	9

Contract No. 7.—Buckland Bridge.—Foundations.

Tucker	420	0	0
Wheeler	275	0	0
ALLEN, Reading (accepted)	233	0	0
Surveyor's estimate	193	1	2

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READING—continued.

Contract No. 6.—Buckland Bridge.—Steelwork.

Allen	£180	0	0
Horsehay Co.	152	10	9
Newton, Chambers & Co.	150	10	0
Cochrane & Co.	141	0	0
Tucker	140	0	0
Rubery & Co.	138	19	5
Tildesley	135	0	0
Finch & Co.	134	11	0
Shewell & Co.	131	9	2
Pitts	130	12	6
Dyne, Steel & Son	123	15	0
Ellis	122	3	0
Woodall	121	4	0
Cottrell & Co.	119	9	9
J. J. Robins (<i>too late</i>)	118	17	8
Lysaght, Limited	114	13	10
Peirson & Co.	113	18	6
Barry & Higham	110	0	0
Brettell	106	0	3
Hill & Smith (<i>too late</i>)	104	2	0
Cleveland Bridge Co., Limited	94	0	0
Surveyor's estimate	114	18	8

WALTHAM CROSS.

For Building House at the Sewage Works, Waltham Cross, for the Cheshunt Urban District Council. Mr. S. TOWLSON, Architect, Cheshunt.

W. LAWRENCE, Waltham Abbey (*accepted*) . £298 10 0

WELLINGBOROUGH.

For Building Chimney Shaft at their Water Pumping Station, Bushfield, for the Urban District Council.

H. Dorman, Wellingborough	£133	10	0
W. Berrill, Wellingborough	132	13	0
E. Brown & Son, Wellingborough	127	0	0
R. MARRIOTT, Wellingborough (<i>accepted</i>)	123	0	0

WEST HARTLEPOOL.

For the Provision and Fixing of Furniture for the West Hartlepool Public Library. Mr. J. W. BROWN, C.E., Borough Engineer.

C. BURTON & SON (wainscot oak) (*accepted*) . £440 0 0

WEST HAM.

For Supply of a 12 Horse-power Nom. Portable Steam-engine, for the Town Council. Mr. LEWIS ANGELL, Borough Engineer.

A. Scott & Co., Manchester	£380	0	0
E. R. & J. Turner, Ipswich	321	11	0
C. Burrell & Sons, Limited, Thetford	320	0	0
Marshall, Sons & Co., Limited, Gainsborough	257	0	0
R. Hornsby & Sons, Limited, Grantham	250	0	0
RUSTON, PROCTOR & Co., Limited, Lincoln			
(<i>accepted</i>)	239	0	0
Barrows & Co., Limited, Banbury	233	0	0
Robey & Co., Limited, Lincoln	227	0	0

WIMBLEDON.

For Construction of Culverts, with Manholes, for the Wimbledon Urban District Council. Mr. C. H. COOPER, Engineer.

E. Iles, Mitcham	£1,172	0	0
S. Kavanagh, Kingston	1,133	8	2
G. Bell, Tottenham	1,094	0	0
T. Adams, Wood Green	1,069	0	0
Mayo & Co., Brixton	983	0	0
W. CUNLIFFE, Kingston (<i>accepted</i>)	978	4	0

WOOLWICH.

For Supply and Delivery at Woolwich of Stone, for the Woolwich Local Board. Mr. H. O. THOMAS, Surveyor.

Broken Guernsey Granite.

W. Griffiths, North Woolwich	£1,241	5	0
Tuff & Miskin, Rochester	1,225	8	4
A. & F. Manuelle, Leadenhall Street	1,217	1	8
Mowlem & Co., Westminster	1,208	2	6
Sommerfeld, London	1,153	15	0
W. Muir & Co., Gracechurch Street	1,153	6	8
FENNINGS, London Bridge (<i>accepted</i>)	1,122	1	8

Flints.

Fry Bros., Greenwich	120	0	0
J. S. Gabriel, Lambeth	117	10	0
E. Lonergan, Plumstead	113	6	8
Smead, Dean & Co., Sittingbourne	105	0	0
R. Lake, jun., Sittingbourne	102	10	0
TUFF & MISKIN (<i>accepted</i>)	97	10	0

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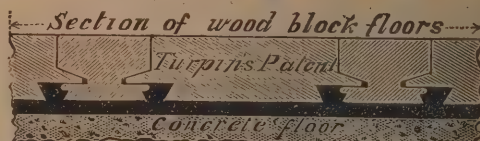
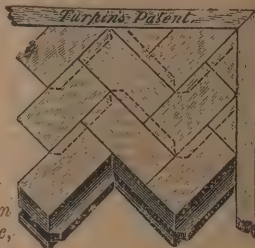
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VARIETIES.

IN regard of the proposed drainage scheme, the Linlithgow Police Commissioners have resolved to submit the question to Professor Armstrong. In consequence of the refusal of the Duke of Hamilton to lease ground for the proposed works in the neighbourhood, they seek an opinion whether the new scheme of works will create a nuisance.

At the meeting of the Caithness County Council accounts were submitted showing that 828*l.* 13*s.* was spent on cutting the snow on the county roads during the past winter, and that the Highland Railway Company paid 2,027*l.* for snow cutting.

The successful candidate for the post of highway surveyor for the Selby Rural District is Mr. John Walker.

WE regret to record the death of Mr. Arthur Loader, of Brighton, who was much esteemed both in public and private life.

THE *Scotsman* says:—A new industry is about to be started near Johnstone. Mr. D. R. Adam, Kirkhill Collieries, Cambuslang, is erecting machinery at No. 3 Douglas Pit, Inkeremann, for the conversion of the huge bings of blaze into bricks. The works are to be extensive.

THE subsidences in the Ladywell district of Motherwell caused by the coal working in the neighbourhood are still extending, and a building which for some time has been partially damaged is now in imminent danger of collapsing altogether. The tenants of several of the houses have had to remove, part of the property being condemned as unsafe.

KILSCONNEL CHURCH, county Wicklow, has been destroyed by fire, the outbreak having been caused by the overheating of a flue, which took place while service was being held. The congregation safely dispersed without panic arising.

At the meeting of the Glasgow Association of Students of the Institution of Civil Engineers, Mr. D. Drummond, M.Inst.C.E., president, in the chair, Mr. Robert F. Miller gave a short description of the setting out of the Black Rig tunnel on the new Loch Katrine aqueduct. This tunnel is 2½ miles long, driven from both ends and also from two shafts placed a mile and a half apart. Until the tunnel is driven between each shaft and the open end nearest it, the line has to be set off from a basis of about 6 feet long, obtained by plumbing down the shafts, which are 160 and 110 feet deep. The following office-bearers were elected for session 1895-96:—President, Wm. Crouch; vice-presidents, John Cowan, jun., J. E.

Harrison and Thos. Nisbet; honorary secretary, W. B. Vinters; student members of council, W. C. Easton, W. M'L. Homan, Angus M. Stewart and Thomas H. Watt.

At the meeting of the Johnstone Town Council there was a prolonged discussion on an application by Messrs. Kerr & Watson for gas supply for several buildings they are erecting at Thorn. Bailie Green contended that it was illegal to put down pipes at the ratepayers' expense till the street was taken over. The matter was remitted to a committee.

WE hear that Mr. George Wragge, of the Wardry Art Metal Works, Chapel Street, Salford, has appointed Mr. Pridmore (for many years with Messrs. Richardson, Ellson & Co.) as his representative in London, and that he will act solely on his behalf. Mr. Pridmore has models and sections of the various wrought-iron and steel sashes and casements and also specimens and photographs of artistic metalwork at Mr. Wragge's showrooms, 22 Surrey Street, Strand, W.C.

THE accounts of the London and Lancashire Fire Insurance Company for the past year have just been issued to the shareholders. They show a net premium income of 846,213*l.* 12*s.*, a surplus on the year's underwriting account of 65,256*l.* 17*s.* 8*d.*, and interest on investments, &c., of 29,722*l.* 18*s.*, the two latter items representing a total profit on the year's operations of 94,979*l.* 15*s.* 8*d.* The directors propose to pay the same dividend as for last year, viz. (including the interim) 10*s.* per share, or 20 per cent. on the paid-up capital. The financial position of the company will then stand as follows:—Capital paid up, 212,750*l.*; reserve funds, exclusive of capital, 700,201*l.*; reserve capital at call of directors, 1,914,750*l.*

MR. J. E. KNOX, of Kennington, who is known for his restoration of wood-carvings in ancient churches and old English mansions, associated with Mr. Stephen Webb, the recently-appointed teacher of design at South Kensington, is showing at the spring exhibition in the Walker Art Gallery, at Liverpool, a duplex-fronted upright piano-case, most unique in its details. The lop-sided piano is completely superseded. Back and front are alike, and the outer case is finished in satinwood, with marquetry engraving on rosewood ground. There is no back keyboard, but beneath the back fall is a repertory for sheet music finished in satinwood.

THE new and revised edition of "Cassell's Illustrated History of England" just completed has occupied nearly nine years to produce. The new illustrations prepared expressly for this edition have cost upwards of 11,000*l.*

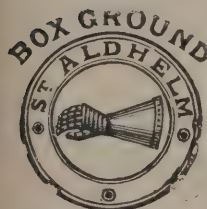
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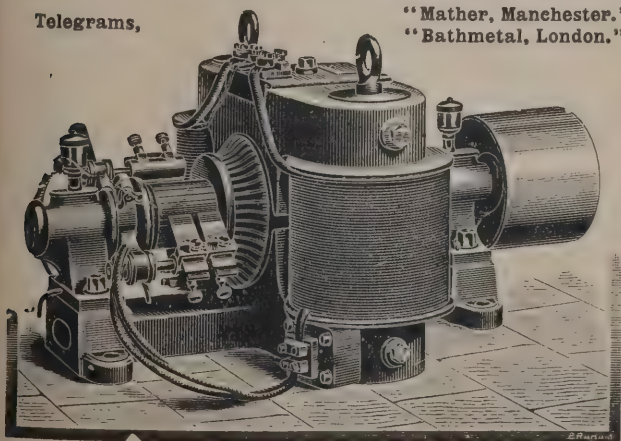
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SMOKING-ROOM, JUNIOR CONSTITUTIONAL CLUB, PICCADILLY.

ENTRANCE FRONT, BRERETON HALL, CHESHIRE.

TRADE NOTES.

TENDERS are invited from sculptors and others for the erection of a public fountain, Pontypridd, the gift of Mr. A. Thomas, M.P. Specifications, with full particulars, may be obtained from the architect, Mr. C. B. Fowler, Old Bank Chambers, 27 High Street, Cardiff. Tenders not later than April 30.

THE Annan Academy, Annan, is being warmed and ventilated by means of Shorland's patent Manchester grates and patent exhaust roof ventilators, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

WE learn that Mr. Douglass Francis, who, for over fifteen years, was connected with Messrs. Goodwin, Barsley & Co., has started business on his own account at Loughborough Road, Leicester. The new works and showrooms of Messrs. Francis & Whittington, ironfounders and hot-water engineers, are in Mansfield Street, Leicester, and are now on the eve of completion, and in a few days the latter will be furnished with a large and well-selected stock of marble and wood chimney-pieces, tiled registers and kitchen ranges, builders' ironwork, &c. The central situation of the works will contribute to ease in executing and despatching orders.

WE are pleased to inform our readers that the Britannia Company, of Colchester and London, are now opening an electrical department at their London office, 100 Houndsditch, for all kinds of high-class electric work, more especially for electric lighting and transmission of power. This company is well known in connection with their Britannia oil-engines, which require no electricity, steam, boiler, driver, nor water, except for the water jacket.

THE "Journal of Useful Information" of Messrs. Romeike & Curtice, of the Strand and High Holborn, is unique in respect that it is entirely typewritten.

A THREE-LIGHT richly stained and painted memorial window was placed last week in the north transept of the parish church, Harrow-on-the-Hill, the subjects represented being "David," "St. Luke," and "Miriam." The window was designed and executed by Messrs. W. B. Simpson & Sons, 99 St. Martin's Lane, W.C.

ELECTRICAL.

THE Board of Trade have decided to grant the provisional order applied for by the Leigh Urban District Council for power to supply electricity within the area of their jurisdiction. The Board have also granted the order sought by the Radcliffe Urban District Council for power to supply electricity within the urban sanitary district of Radcliffe.

At the Ayr Town Council meeting Mr. Hammond, electrical engineer, reported that the new works in Mill Street were progressing satisfactorily. A high-tension main had been laid in Mill Street, a low-tension main from Mill Street to the top of High Street on the east side, and a high and low tension main on part of the west side of High Street. It was suggested that the light should be taken into the Town Hall and into all the properties belonging to the burgh.

THE citizens of Edinburgh have had the satisfaction of seeing the electric light turned on for street illumination. Elsewhere we refer at more length to the subject.

At the St. Pancras Vestry's meeting, Mr. Churchwarden J. Thornley, J.P., presiding, the electricity and public lighting committee presented a statement of accounts for the year ending December 31 last, and drew attention to the very satisfactory result of the past year's working. The generation expenses in 1893 amounted to 6,103*l.* 4*s.* 1*d.*, and in 1894 to only 73*l.* 5*s.* 1*d.* in excess of this amount, while the increase in the current sold to private consumers reached 2,510*l.* 12*s.* After paying all charges for repairs and maintenance, including rates and taxes, there was an available balance of 7,233*l.* 1*s.* 4*d.* to meet the interest and payments of the instalments off loans, namely, 5,379*l.* 19*s.* 2*d.*, comprising interest on the bank overdraft. Hence there was a net profit on the year's working, after providing for bad debts, &c., of 1,753*l.* 18*s.* 2*d.* This sum, with the amounts paid for interest and repayment of loans, was equivalent to a dividend of over 6 per cent. on the capital expenditure, and would be available

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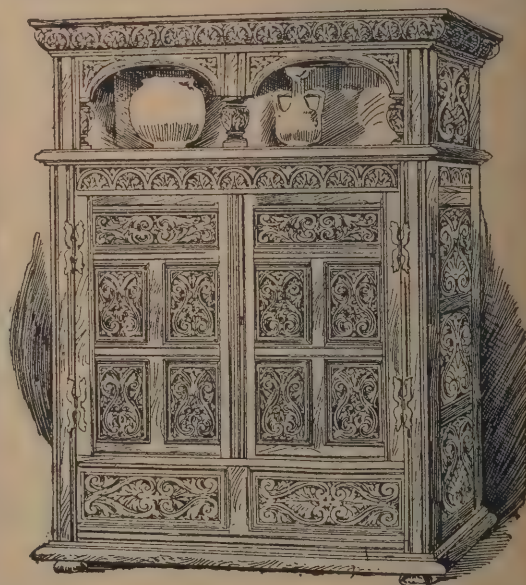
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Replica of an OLD ENGLISH Carved Oak Hall Press, 16th century, 5 feet wide, 7 feet 6 inches high.

for distribution to the shareholders if the undertaking belonged to a company. The committee considered that the sums paid off loans by St. Pancras in 1894 was equal to nearly 2 per cent. on the capital expenditure, and was equal to the sum set aside for depreciation by three London companies who were working on similar systems to that in St. Pancras, while if the comparison was made with the total capital expenditure of the whole of the London companies, it would be found that the amount set aside by them for depreciation was under 1 per cent. The charge for public lighting during the year, although more lamps had been erected, was reduced by 515*l.* 16*s.* 11*d.* in one quarter owing to the charge being reduced from 6*d.* to 5*d.* per unit. Current sold to private consumers at 3*d.* per unit realised 1,236*l.* 13*s.* 9*d.*, and at 6*d.* 10,819*l.* 15*s.* 9*d.*

THE Bath Town Council propose to apply for a provisional order for electric lighting purposes.

THE electric light has just been inaugurated at the Brill's Baths, Brighton.

BUILDING AND BUILDERS.

THE War Department's torpedo factory at Chatham is about to be taken down, the site being required for the new naval barracks. The works will be removed to a spot near Gillingham Pier.

REVISED plans were submitted at the meeting of the Renfrew Town Council for approval in regard of works for the Joint Hospital Board, the probable cost to be 7,000*l.*, with a further expenditure of 500*l.* for furnishing.

AT the meeting of the Fife and Kinross Asylum, it was agreed that the large new wing of the asylum should be connected with the main building by covered ways, which it is expected will cost about 1,000*l.*

AT their meeting the Govan Town Council considered the report of a sub-committee recently appointed to inquire as to the accommodation provided for the official departments of the burgh work, and as to the cell accommodation in Paisley, Coatbridge, Leith, Dumbarton and Partick. As the result of their investigations the committee gave it as their opinion (1) that the burgh departments in Govan should, if possible, be more centralised; (2) that the accommodation in Albert Street was deficient; (3) that the fire-station required enlargement and rearrangement, and (4) that more accommodation should be

provided for board and committee meetings. The report was adopted and ordered to lie on the table for a month.

IT is proposed to convert the drill hall, Swansea, into a theatre. Messrs. J. P. Jones & Rowlands, architects, Cardiff and Swansea, are preparing the designs.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE annual dinner of the Builders' Clerks' Benevolent Institution was held on the 9th inst. Mr. Charles Wall presided. He stated that the total income for the past year was 808*l.* The annual subscriptions amounted to 227*l.* 6*s.* 8*d.*, while the donations came to 326*l.* Dividends brought in 128*l.* 4*s.* 3*d.*, and a legacy of 250*l.* was bequeathed to the society by the late Mr. Thomas Robinson, of which one moiety, namely 125*l.*, had been paid. They all knew that as each Christmas came round it not only added to one's age, but took a little off one's stability and physique. Builders' clerks were no exception to the rule, and those who fell out of line had to be looked after in a proper manner. Referring to old age pensions, he said he feared they were still a great distance off. In addition to the clerks there were widows whom the institution assisted. It was a distressing thing for a family to be bereft of its head and support, but it must be a pleasing thing for a widow to know that her late husband's friends would come forward to help her. It was also necessary to remember the orphans. At present the number of pensioners was nineteen, and there were some orphans in the Orphan Working School at Haverstock Hill. These were entirely dependent upon the institution for support. Mr. Wall concluded by commending the institution to the company's generosity. The secretary afterwards announced that the subscriptions amounted to 272*l.* 17*s.*

THE BLACKWALL TUNNEL.

THE Blackwall Tunnel under the Thames has been pushed forward, says the *Standard*, with great rapidity and with remarkable success. Messrs. S. Pearson & Son, who had driven 2,000 feet of the tunnel under the Hudson River, for the purposes of the Blackwall operation have developed and carried out the shield arrangements upon a more extensive scale and with increased perfection of details, adequate to the requirements of the vastly greater magnitude of the present undertaking. The operations which are now going on are

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upon a scale not heretofore witnessed. Long open approaches are hoarded off from the streets; huge iron shafts in process of being sunk into the earth rise like round towers above the houses; and great open spaces of waste ground are covered with engine sheds, cranes and other appliances for the subterranean burrowings. All the intercourse between the two sides of the river has in the past been carried on by little ferry skiffs, which are still the only means of transporting very occasional passengers at fourpence a head for the waterman's toll. The new tunnel will run from the entrance of the East India Docks on the north to the Greenwich marshes on the south side of the river, the idea being to shorten the distance from Woolwich, Deptford and Greenwich to the docks, and otherwise open out a large tract of land covering many hundred acres on the Greenwich side for dwellings for the working classes. The London County Council has acquired considerable areas, and has already built several blocks of buildings and erected some cottages at the head of the Blackwall Lane on Greenwich Marsh.

The tunnel and its approaches are 6,200 feet in total length. Commencing close to the East India Docks there is first an open cutting 785 feet long, gradually descending with a gradient of 1 in 34. From this there is a cut and cover length of 436 feet. The tunnel proper follows for 891 feet from the centre of the No. 1 shaft. This shaft, which is typical of the others, is composed of an iron caisson, of 58 feet outside and 48 feet inside diameter, the interspace between its two skins being infilled with concrete. Its depth is 80 feet. At this point the tunnel deflects to the left, and reaches its maximum depth at a further distance of 447 feet. Shaft No. 2 is sunk to 100 feet. From this point the tunnel is level across the river, the depth of the roadway being 72 feet below Trinity high-water mark. The portion of the tunnel passing under the river is 1,212 feet long. Shaft No. 3 has been sunk to its final level, and the tunnel driven through it under the river-bed. The advance of the tunnel to 700 feet brought it within 6 feet of the river-bottom, where there was nothing but flint ballast. Over this dangerous part the Thames Conservators have allowed the contractor to put 10,000 cubic yards of puddled clay. From No. 3 shaft the tunnel begins to rise again, the gradient being 1 in 36 for 602 feet. This piece has already been completed to No. 4 shaft, which has been sunk to a depth of 80 feet. On the land side of No. 4 shaft there are 946 feet of cut and cover completed, and 860 feet of open approach. The tunnel and cuttings will be lined with glazed white bricks or tiles above the foot-

path. It is 24 feet 3 inches internal diameter, and the traffic roadway through it is 16 feet wide, the curved space beneath it being adapted as a subway for gas and water mains and electric leads. There are two footpaths, one on each side, 3 feet broad.

The tunnelling operations were begun on the Kent side, on account of information derived from the borings, which showed that the London clay existed there as a much more regular bed than on the Middlesex side, and formed a watertight cover to the subterranean workings. The rapid progress made under the river is notable, the rate of advance of the heading having been about 57 feet per week. As much as 500 feet was done in the first two months, and the *débris* carted away has exceeded the largest quantity ever taken out of any other tunnel. Since the employment of cotton-powder as an explosive, as much as 67 feet 6 inches advance has been made in one week. The engines originally employed for compressing the air developed nearly 2,000 horsepower, but this has been increased to meet emergencies in keeping out the influx of the river since the dangerous gravel crux was encountered. The working pressure of the air at the face of the shield is over 23 lbs. to the square inch, as shown by the barometer rising to 6 feet 9 inches of mercury. The shield is 27 feet 8 inches in diameter, and 19 feet 6 inches long, weighing 250 tons. It is propelled by twenty-eight hydraulic jacks, each capable of exerting 120 tons, or, all collectively, over 3,000 tons pressure, to force the cutting rim of the shield into the unexcavated soil before it. There are twelve working compartments in it. The miners first cut out the centre of the soil face; then cut out other parts around; and, finally, the cutting rim of the shield is forced forward and brings down the circumferential or outer ring of soil. The *débris* is taken away in trucks; and, as the heading advances to the extent of 2 feet 6 inches, the hydraulic erector lifts up consecutively the fourteen iron segments which form one ring of the circular iron tunnel and places each in position. Being planed at the edges to a close fit, they are bolted together through their flanges, a key-piece being inserted to complete the arch. The full ring weighs 16 tons. Grout is forced through holes in the ring to fill up the interspace between the outside of the iron tunnel and the inside of the larger boring made by the cutting rim of the shield. The interior of the tunnel is concreted to a plain surface, for the reception of the white glazed tiles.

A diaphragm provided with air-locks is built across the tunnel behind the shield, to retain the compressed air, and to



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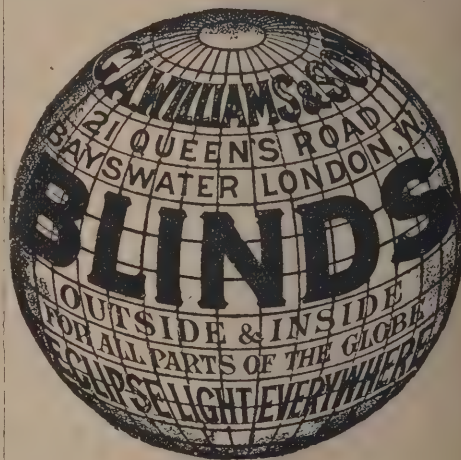
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preserve the completed work from inundation. This diaphragm is shifted forward as the construction of the tunnel proceeds. Provision is also made for the personal safety of the miners by a hood connected with the shield, which will preserve breathing air in case of an inrush of water, and further means is afforded for the men to get through to the air space in rear of the shield. Working under such severe air-pressure renders men with any defects of heart action liable to paralysis of the lower portion of the body, and provision is wisely made within an iron boiler-shell for a hospital for two or more persons, where they can be properly treated by being again put under air-pressure and relieved gradually, as is needful in such cases. Hot coffee is also constantly ready, and a man always in charge of the arrangements. The miners work in shifts of eight hours, but have an interval of three-quarters of an hour in the middle of that period, and hot coffee is served to them at every half-shift. Every possible care seems to be taken of the workmen by the contractors, and no serious case of illness has yet occurred. Lady Pearson has had an iron chapel erected for Sunday and other services. The practical work is under the charge of Mr. E. W. Moir, who has had the most valuable experience of the American operations already referred to, in which he held the position of contractors' engineer, as he now does under the same firm at the Blackwall Tunnel. The resident engineers on behalf of Mr. Binney, the engineer-in-chief to the London County Council, are Mr. David Hay and Mr. Fitzmaurice.

THE ELECTRIC LIGHT IN EDINBURGH.

THE electric light was turned on on the night of the 11th inst. in Edinburgh for public purposes amid a great display of popular interest. In the afternoon, at five o'clock, says the *Scotsman*, an opportunity was given to a large number of leading citizens—mostly probable customers in the compulsory area—to inspect the new central electric station, and on the occasion short speeches were made by Lord Provost M'Donald, Councillor Mackenzie, chairman of the electric light sub-committee, and Professor Kennedy, the Corporation's consulting engineer, in which explanatory statements were made regarding the present installation and the financial prospects of the scheme. On the latter point the most sanguine hopes are apparently entertained, the applications for the light having exceeded what were looked for by the committee and the consulting engineer at this early stage of the undertaking. So far

as the general public were concerned, however, the part of the ceremonials which interested them most was seeing the light actually turned on. After the ceremony at the central station, the members of the Corporation and officials dined together in the Rutland Hotel in a room on the first floor, the windows of which commanded an uninterrupted view of Princes Street. Shortly after seven o'clock a large crowd began to assemble outside, and by eight o'clock—the hour fixed for the ceremony—the whole of the neighbourhood of the "Four Lamps" was filled by a compact mass of people. The size of the crowd made it quite impossible to estimate the number in it. It was with the utmost difficulty that vehicular traffic could be maintained at the West End. The crowd stretched away down the street and into Lothian Road, and was regarded as in size to be one of the largest seen on the streets of Edinburgh for many a day. It was quite dark at eight o'clock. In the Rutland Hotel a wire had been carried from the central station, upon which was a switch and lever by which the current was to be sent coursing down the street. The electric light committee had requested Mrs. M'Donald, the wife of the Lord Provost, to perform the ceremony, and by her the light was turned on in the most purposelike way. The switch was fitted up on a table in one of the windows, and was embedded among flowers. Professor Kennedy, who had set the time at the central station, sat, watch in hand, waiting until the hour was reached. In the meantime the loyal and patriotic toasts had been pledged, and success had been drunk to the electric light scheme amid enthusiasm. Then there was a pause for a minute, and great was the excitement both inside and outside the hotel. "Now," called Professor Kennedy, and in response to the invitation Mrs. M'Donald pulled the lever, and as if by magic the current flashed along the street; the lamps were lit from end to end almost as quickly as the eye could look along the length of the thoroughfare, the darkness was illuminated, and a ringing cheer, begun in the hotel, was caught up by the crowd, and went surging along the street as the invisible current had done a moment before. The inauguration had been a great success, and upon it Professor Kennedy and Mr. Mackenzie were heartily congratulated. For an hour or more after the ceremony the crowd showed little signs of diminution, but instead of concentrating themselves at the West End they walked along the street and enjoyed the well-lit promenade, on which, on the north side of the street, faces could be discerned with

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nearly the plainness of midday. The south side, where there are no lamps, was much better lighted than it used to be under the old gas-lighting; but it was noticeable that a very deep shadow was cast into the gardens, which rendered it well-nigh impossible to make out any of their features. The street looked splendidly, and it will show even to more advantage when the old lamps are removed and private lamps are lit up, as they inevitably must be at no distant date, with the electric light.

BUILDING IN GLASGOW.

At the last meeting of the Glasgow Dean of Guild Court, the busiest that has been held for over twenty years, there were no fewer than seventy-eight applications for linings, the cases alone representing 138,000*l.* worth of new property which it is proposed to erect in the city. A lining was granted to Messrs. Howard & Wyndham, theatrical proprietors, to restore and reconstruct the Theatre Royal, in Cowcaddens, Hope Street and Rutherford Lane. Although the interior of the new house will be similar to that which existed before the fire, the plans provide for several important alterations in details which will conduce to the public safety and comfort. Mr. C. J. Phipps, architect, in his designs has had specially in view the prevention of fire. The auditorium and the stage will practically form two separate buildings. The gable which formerly divided the two parts will be allowed to remain and constitute the boundary of the auditorium. A new wall will be erected 10 feet behind, and will form the boundary of the stage, thus giving practically a double proscenium wall, and avoiding contact between the roof of the auditorium and the roof of the stage. The whole of the opening of the stage will be filled up by a fire-resisting curtain, 3 to 4 inches thick, made of iron framework, covered on both sides with asbestos boards three-eighths of an inch thick, and filled in solid with silicate of cotton. This, in the opinion of Mr. Phipps, will afford the greatest possible protection to the public, because supposing any accident should arise on the stage, where a fire usually breaks out, all danger will be removed from the sight of the audience, and a panic thereby avoided, as the curtain can be lowered by hydraulic pressure in 40 seconds. In Mr. Phipps's opinion the stage might be burned out and the auditorium remain safe. The present staircases will remain, but they will be roofed with concrete. The auditorium will accom-

modate about 3,000 persons, an increase of 500 on the old house. Three hundred seats will be added to the pit, and the gallery will be reduced in size to allow of a refreshment-bar being provided on the top floor. The boxes will remain the same, and will have emergency staircases leading to the street. The old horse-shoe dress circle will have less of a sweep, being brought nearer the stage. The chairs will be on a greater slope, thus commanding a better view of the proscenium. The corridors are to be of concrete, as well as the passages to the dressing-rooms and the dressing-room staircase, and the gallery and upper circle stair covered with concrete at the top. The flies on both sides of the stage are to have double iron doors. The roof of the auditorium is to be lowered 6 feet, and the depth of the stage is to be slightly less than formerly. The entrances to the theatre remain the same, the main entrance being from Hope Street, and access to the pit and gallery being from Cowcaddens. The new Theatre Royal is expected to be one of the best equipped and most comfortable in the kingdom, and to this end about 20,000*l.* will be spent. Messrs. Morrison & Mason are the contractors. Special efforts will be made to complete the house by September 6 for the engagement of Mr. George Alexander, who will open the theatre.

Plans were passed authorising the formation of a new feuing road to the west of the Glasgow Skating Club's pond. This road, which is proposed to be called Whittingehame Drive, is situated on a pleasant rising ground, and has been laid off for the erection of villas of moderate size and price. A demand exists for houses of the class proposed to be built in Whittingehame Drive.

THE NATIONAL PORTRAIT GALLERY.

The new building, the designs for which the late Mr. Ewan Christian was commissioned to make in 1890, and the erection of which was commenced some four years ago, is now near completion. The structural portions are finished, and only the minor and ornamental details remain to be executed. These will still occupy some time, but it is expected that the edifice will very shortly be out of the contractors' hands. The site is the irregular plot of ground adjoining the east and north-east end of the National Gallery, and abuts on the Charing Cross Road, at its southern end by Trafalgar Square. The main block, 150 feet in length, faces the north, and is 67 feet in

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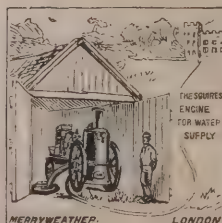
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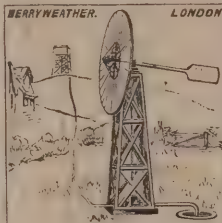
The "Times" says:—"A Practical Pamphlet."



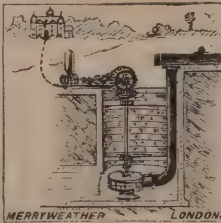
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depth. The eastern block, at right angles to the former, has a frontage of 140 feet, and a depth varying from 16 feet to 27 feet. The whole edifice is of Portland stone, with grey Cornish granite base, and with its broad and severe treatment, and bold, simple mouldings, has architectural features of marked excellence. The principal entrance is placed in the north-east angle between the northern and eastern blocks, and thus is made to mask the differences of style of the two portions. It consists of a semicircular arch in polished grey Penrhyn granite, with the Royal Arms, carved with more than usual spirit, in the tympanum over the doorway. The rise from the level of the pavement is made by eleven steps to the entrance-hall of the ground floor. Passing to the left, the long Sculpture Gallery of the east wing is entered, well lighted from the windows in the east front. Going further up the main stairs, which are 11 feet broad, with descending flights on each side 7 feet wide, and turning to the right, we enter the reference library of works containing portraits, and the Miniatures Gallery, with its table cases. Adjoining are the board-room and administrative offices, very conveniently arranged. Continuing the ascent by the principal staircase, the first floor is reached, passing at midway the access to the east wing. This part of the east wing contains a large picture gallery, 42 feet by 20 feet, a narrower gallery of 33 feet and a semicircular gallery, 26 feet by 25 feet, all these galleries being for water-colours or loan collections. On the first floor of the northern building are an eastern corridor and a central corridor, with separate galleries, some 40 feet by 20 feet, on each side. These will be mainly devoted to cabinet-sized pictures. There is also on this floor a repairing-room for the pictures and their frames, with a large lift for their transmission to it from below. Ascending again by the principal stairs, the top floor is reached, the stairs terminating in a very charming stone arcade, through which are seen the windows which light the side stairs. The central stairs are lighted by large windows in the external wall, their lead patterns being filled very prettily with white Venetian glass. The landings and entrance hall are paved with marble mosaics, which present a roughened surface, like that which gives to the old Roman mosaics their characteristic appearance. The upper floor is the principal one for pictures. It is divided into a number of galleries, there being three 40 feet by 20 feet, and one long one 58 feet by 18 feet; also seven smaller galleries, the whole of which are lighted from the roof. All the galleries throughout the edifice have their brick walls lined for about 10 or 12 feet with wood, so that the pictures may be

fastened direct to them without cords or rods, and can be removed or changed as desired. The galleries on the upper floor are about 15 feet in height to the coving; this adds 4 feet vertically up to the bases of the skylights, which are dry-glazed, and have each slope inclined at a proper angle for showing off the pictures. The galleries on the first floor and on the ground floor are 16 feet in height. The ceilings are everywhere very chastely and slightly ornamented. The woodwork of the interior doorways and doors, the friezes, the panellings over the ventilating arrangements and the floors are of teak, rubbed down and waxed, and the mouldings are bold and simple. The screens are splayed so that the light derived from the windows properly illuminates the pictures placed upon them. There is also a photographic gallery, well lighted from above, for the copying of pictures, and a second picture-cleaning room and accommodation for students. There are also special entrances, passenger-lifts, and other very convenient arrangements. Further, on the upper basement is a very fine gallery, with wall space for a large picture 35 feet high, rising through the ground floor, and well lighted by three side windows and top light. The lower basement contains the boiler-room, the engineer's and police rooms, and the stores. The flat roof is a fine specimen of cast lead work, and is divided by numerous flat gutter ways, all delivering towards the south side, the down pipes being of earthenware, for the purpose of avoiding the expense and difficulties of the repeated paintings required by iron pipes. Extraordinary care has been taken for the security of the massive cornice, some of the corner stones being of immense size, and all the others having a full and firm grasp right across the entire thickness of the walls, which are no less than 3 feet in thickness. The style of architecture cannot be classed as of any particular order, but it is well suited to the purposes to be provided for. The façades have commanding aspects. The two tiers of broad windows, with the medallions above them, afford quite sufficient decoration, without cutting up too much of the ample breadth of wall-surface. The medallions contain each of them the head and face of some eminent personage, commencing at the west end with Chantrey and terminating on the east with Vandyke, the series including Earl Stanhope, who may be regarded as the founder of the institution. Although the Gallery will not be opened to the public before June, some of the saloons have been handed over to the authorities, and some of the pictures have been brought in to afford trials of the most favourable spaces for their display.

"CLIMAX"

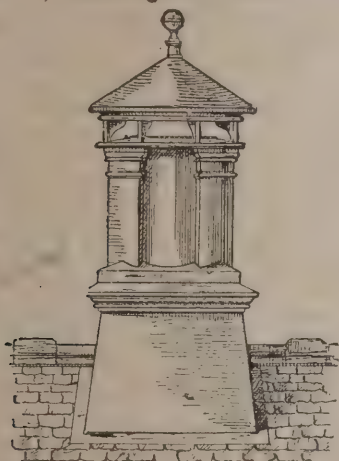
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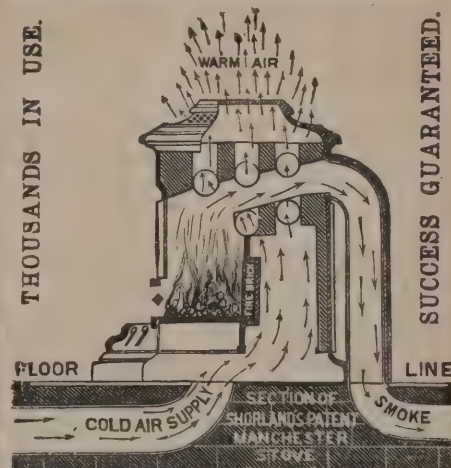
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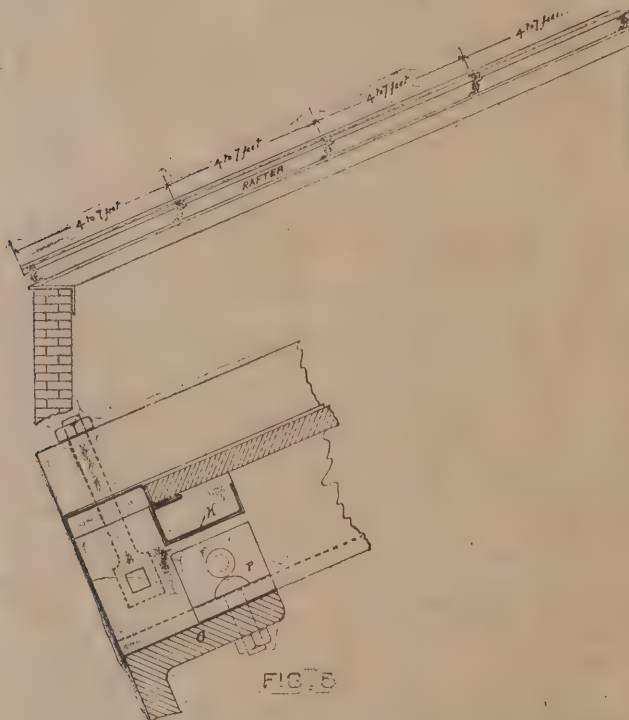
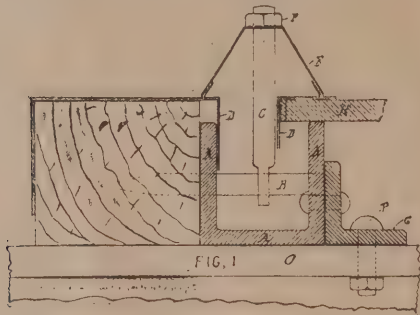
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WHEN Cowper said that whoever loves a garden loves a greenhouse too he expressed a national feeling. Since the poet wrote the greenhouse has become more of a domestic institution, and it is to be seen in varieties corresponding to the necessities of nearly all classes. It is possible to have one of very simple construction, and indeed the simplicity offers a temptation to people of moderate means which is irresistible. If subsequently they discover that simplicity does not necessarily mean economy or insurance, a corresponding fact is afforded by many other kinds of work.

There is, however, a fascination about the roofing of which the greenhouse is a species which must always tempt men of constructive abilities. Whether seen in a railway terminus or in a cottage conservatory, the conditions of the problem are alike. It is necessary, in the first place, that the roof should have great rigidity, and yet be light. As glass cannot be kept from breaking, it should be replaced with ease. Drainage is also important, including the carrying off of condensation. All the qualities that are desirable appear to be found in the new and patented system of the Paradigm Construction Co., of 1 Great College Street, Westminster.



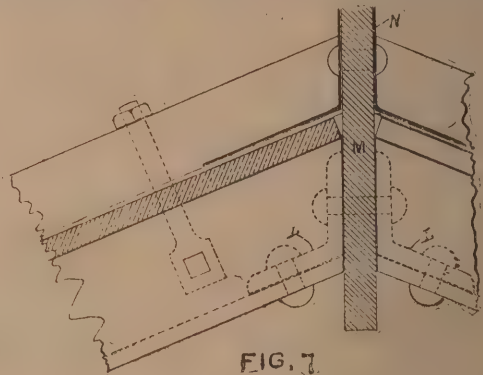
In the first place, the main bars are of steel and of channel section; they are, in fact, miniature girders. The employment of a similar but larger section as struts for railway and other bridges is evidence of the stiffness of the form. When employed in roofing it has the advantage of serving for drainage. It may be objected that the section would form a receptacle for dust, but one of the advantages of the Paradigm system is that it can be covered by a sloping cap of copper, which not only preserves it, but especially in the case of roofs which are entirely visible becomes a pleasing addition to the general appearance. If desired, a flat cover of iron with lead or copper can be substituted. The channel iron is attached to the purlins by small angles. On the bars the plates of ribbed glass rest. From the flexibility of the copper caps there is no difficulty in removing or replacing the glass. The joints are also protected and supported by sheet metal bars, which are most ingeniously devised for their special purpose of support besides serving as drainage. If it be desired to obtain immunity from broken glass, copper, brass or iron wire mesh can be stretched between the main bars and secured in the simplest way by cross pins. In fact, the whole arrangement is scientific construction, for contingencies are provided for and

safety is secured. It is no wonder, therefore, the system has found favour with many of the leading engineers in America, and areas varying from 10,000 to 45,000 square feet have been covered without extraneous aid. In the power house of the Edison Company at Chicago the Paradigm skylights have a superficies of 15,000 feet.

No less remarkable is the economy not only in first cost, but from the arrangement of the glass and the use of the steel channel bars and the absence of any contraction or expansion which affects the glass, breakage is minimised. The system has an appearance which will satisfy the most fastidious and offers a security which cannot be questioned by anyone who is familiar with the principles of construction.

GOWTHWAITE HALL.

THE Bradford Waterworks in the Nidd Valley during the winter were not only almost at a standstill, but had some of their works greatly jeopardised by the floods, without, however, suffering to the extent that was sometimes feared. Work is now resumed, says the *Leeds Mercury*, and the coming summer, it is expected, will bring great activity into the dale. The construction of the Gowthwaite compensation reservoir has been a very unwelcome intrusion to the farmers, inasmuch as it is to cover what have been the best pieces of their holdings, and moreover in some cases necessitates the removal of the homesteads to higher and more exposed situations. A portion of the highway from Pateley Bridge to Ramsgill and Middlesmoor will become submerged, but this can hardly be counted a disadvantage to the locality, for it is one part of the scheme that this shall be replaced by a more level and less sinuous road, which for the purposes of locomotion, if not from a scenic point of view, will be an improvement upon the old. The site of the reservoir would in the ordinary way include the site on which Gowthwaite Hall now stands, and in the earlier negotia-



tions with the Corporation the owner (Mr. Yorke, of Bewerley Hall) evinced a very natural desire to save from demolition the venerable Elizabethan manor house, which from its erection about the end of the sixteenth century for about 150 years was the home of his ancestors, who then, as now, were the principal landowners of the dale. These wishes were shared also by inhabitants of the dale. In addition to its connection with an esteemed and old local family, Gowthwaite Hall has associations with some of those who in the past have been amongst the most liberal benefactors of the neighbourhood. Mention may be made of Professor William Craven, D.D., scholar and philanthropist, to whom and his kinswoman, Miss Alice Shepherd, the Raikes School at Wilsall owes its endowment. He was born at Gowthwaite Hall in 1730, and it detracts nothing from the interest of the old hall when we add that he was one of several more or less distinguished men who at this house received their first education from the notorious Eugene Aram, whose marriage is chronicled in the Middlesmoor parish register. Possibly the dearth of great names associated with the dale's history may have caused the people of Nidderdale to magnify above its merits the name of Aram, but surely they have excuse when Lytton and Hood have not deemed it beneath

them to immortalise him in their writings. At any rate it cannot be gainsaid that the people of the dale much desired the retention of the old hall, and a sense of relief was felt when it was understood that Mr. Yorke had arranged with the Corporation for an embankment to be made to keep the reservoir from the house, which must then have somewhat of the nature of a peninsula abutting into the reservoir. The difficulties of keeping the water entirely clear of the place are, however, so formidable that the representatives of the Corporation have, we understand, at last prevailed upon Mr. Yorke to withdraw his objections, and the hall is now doomed, Nidderdale thus losing one of its most venerable old houses which added so much to the picturesqueness of this part of the dale.

PURCHASE OF OLD MATERIALS IN GLASGOW.

AN action was lately taken by Mr. McDougall, timber merchant, Glasgow, against Messrs. Land & Sons, auctioneers, about the sale of old building materials of Improvement Trust property in Saltmarket. The plaintiff purchased building materials to the amount of 243*l.*, and a deposit of 30*l.* was made for the fulfilment of the conditions of sale, which provided that the purchaser of the stones and bricks should erect a barricade at his own cost and clear away the rubbish after demolition of the building. Some delay took place in erecting a barricade, which ultimately was put up by the Improvement Trust at a cost of 21*l.* The plaintiff sued for repayment of the deposit of 30*l.*, and the defenders pleaded a counter-claim to the amount of 44*l.* 19*s.* 4*d.*, being the cost of the barricade, ground rent, cost of removing the rubbish and other charges, and further that the plaintiff's action was barred on account of the clause of reference in the conditions of sale appointing James Laird, a partner in defendants' firm, as judge of the sale and arbiter in any differences that might arise. The defendants' preliminary plea was sustained by the Sheriff-Substitute and Sheriff-Principal, but on appeal to the Court of Session the First Division held that the auctioneer, being a partner of the defendants' firm, was barred from acting as arbiter in regard to the questions in dispute, and remitted the case to the Sheriff-Substitute to hear proof. Sheriff Balfour has decided that the plaintiff is only liable for 10*l.* for the use made by him of the barricade and 3*l.* 1*s.* 10*d.* for watching and lighting the same, and 9*s.* 6*d.* for

removing slates, and has found the plaintiff entitled to two-thirds of the expenses. In a note his lordship says that by the conditions of sale the purchaser of stones and bricks was bound to erect a barricade at his own expense, and light and watch the same to the satisfaction of the master of works. The sale was on December 4, and the custom in removing building materials was that before the stones and bricks were removed the lead-work and the doors and windows were taken away. The barricade, therefore, was not put up at once; and although it was provided by the conditions that slates and certain other materials (which rendered a barricade necessary) were to be removed within three days after the day of sale, this was impracticable, because by the Building Regulations Act the pursuer had after seven days' notice to get the consent of the master of works to the erection of the barricade. The plaintiff or his agent delayed to erect the barricade, and in the meantime an accident occurred in connection with the taking down of the buildings, which was reported to the master of works, and he at once instructed the manager of the Improvement Trust to erect a barricade. Before this, however, the plaintiff and his brother had called upon Mr. Whyte, the master of works, as to the barricade, and Mr. Whyte promised to inspect the buildings. But the barricade was erected on December 13, before he made his visit. The barricade was made of new wood, and the Sheriff had no doubt that the plaintiff, if he had erected it, would have used, or attempted to use, the old materials in the buildings, and this would have been done at a trifling cost. But, according to the conditions, the work had to be done to the satisfaction of the master of works, and he condemned the use of old materials for a barricade, and the Sheriff must therefore take it that the outlay of 15*l.* odd incurred in the erection of the barricade was a proper charge. The barricade, however, was afterwards utilised by the Improvement Trust by being put back to the building line in order to protect alleged excavations made by the plaintiff, and ultimately it was used after the buildings were taken down as a barricade for the new buildings of the Improvement Trust. It had not been proved to the Sheriff's satisfaction that excavations existed which required protection, and he thought that as the Improvement Trust ultimately used the barricade for their own purposes the plaintiff should only pay 10*l.*, being two-thirds of the cost, leaving the Trust to bear the other third. The claim for damage done to the pavement and for the removal of rubbish was disallowed, because it was not proved that the

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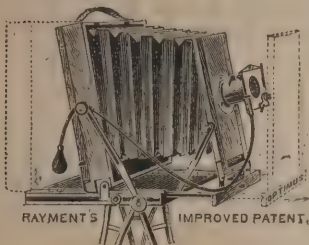
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pursuer's workmen broke the pavement. There was no proof of what the plaintiff failed to level, there was no complaint made to him at the time and the ground was naturally very uneven. The claim for rent for the extra time during which the pursuer occupied the ground appeared to be novel, and the conditions of sale did not provide for any such charge being made. He must hold that in practice the purchasers of building materials were allowed some latitude in removing them, and no charge of rent was made for extra time in removing. The further claim for extra trouble involved by the defendants in visiting the ground was not recoverable from the plaintiff. There was nothing said in the conditions of sale about such a charge, and Mr. Laird must be held to have been acting for the Improvement Trust.

PUBLIC WORKS REFORM IN EGYPT.

It is announced by the correspondent of the *Times* that on Monday the Khedive in Council approved of the scheme drawn up by Mr. W. E. Garstin, Under-Secretary of State in the Ministry of Public Works, for the reorganisation of the Tanzim—a branch of the Public Works Department—which has been for years the subject of much adverse criticism on the score of inefficiency and extravagance due to its centralisation and formalism.

The scheme provides for a complete system of decentralisation, with a division into two branches—one for ordinary repairs and the execution of small works, and the other for the control of all new works costing over 1,000l. The former branch consists of two inspectorates for Upper and Lower Egypt respectively, which are subdivided into directorates under directors residing in the provinces, instead of in Cairo and Alexandria as has hitherto been the case, the powers and responsibility of these directors being at the same time greatly increased. The latter branch will design, make estimates for and control all new Government buildings costing over 1,000l., and will be in charge of Messrs. Hewat and Clifton, who are transferred from the irrigation service. M. Roux, another irrigation official, becomes inspector of Lower Egypt. The cost of this important change will be only about 2,000l. above the present expenditure, which will be amply recouped by the increased efficiency of the department.

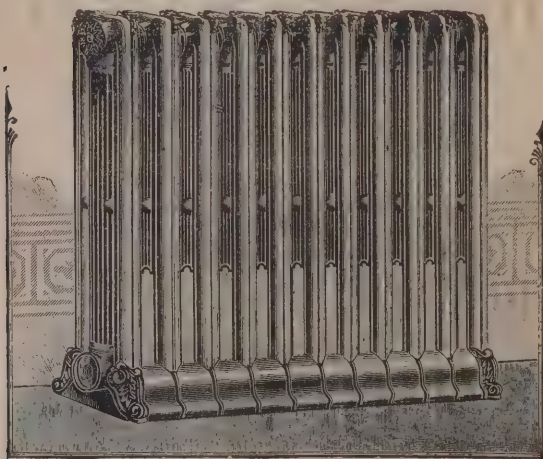
PORTLAND CEMENT: SOME POINTS IN ITS TESTING, USES AND ABUSES.

(Concluded from last week.)

CEMENT is very extensively used in the manufacture of moulded or purpose-made materials, such as paving-slabs, &c. When properly manipulated, with a suitable aggregate, no more satisfactory and economical method of producing these articles can be wished for; but in particular, again, experience and manipulation play a very important part. In making this remark, the author has in mind a sea-wall and esplanade which has come under his notice at a watering-place on the South Coast. The esplanade is formed entirely of concrete paving-slabs, made by the local authorities, the sea-wall being composed of shingle concrete, faced with a coating of richer material, and the whole work forms a perfect example of what can be done with a cement concrete. Within a few miles there is a work of a similar nature, carried out with exactly similar materials, but which work is considerably inferior in appearance, a result that can only be attributed to less experienced manipulation. In making paving-slabs for work of this sort, it is usual to face the top and bottom with about half an inch of richer material, so as to form a more presentable appearance when laid in position, and by making this face on the under side as well, it is possible, when the top has become worn, to reverse the slab, thus doubling its period of usefulness. In such work, where appearance is of considerable importance, it is found advisable to keep the blocks sheltered from climatic influences as much as possible, and during dry weather to moisten them occasionally with water, which is found to preserve their colour to a great extent.

A use for cement, which concerns the architect perhaps more than the engineer, is plastering or rendering the walls of buildings, although a similar use of the material sometimes occurs in the case of reservoirs. In such cases it is most important that the cement should be thoroughly matured and cool, and also that the wall or surface to be rendered should be thoroughly wetted before the plaster is applied, so that the cement shall not be deprived of any of the water necessary for its proper setting and hardening.

The abuses of cement are perhaps not quite so numerous as its uses, but the treatment which it sometimes has to undergo at the hands of inexperienced users makes it a matter for wonder that failures are not more frequent. One of the most



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prolific causes of failure is insufficient attention to the setting properties of the cement under treatment. In very hot weather it is no uncommon thing for a cement to have a very quick initial set, and in using such a cement, therefore, in order to obtain its full strength, it must be mixed and in its allotted position within a very few minutes of adding the water. This often entails the mixing of very small quantities at a time, and if due precautions are not taken a larger quantity is mixed than can be manipulated before setting commences. This generally results in the use of additional water, and the serious detriment, if not total destruction, of the setting properties of the cement. Many cases of failure have occurred, in which the cement being of good quality, though somewhat quick setting, point strongly to over manipulation or "killing."

Another frequent cause of unsatisfactory work is a dirty and unsuitable aggregate. The admixture of a very small proportion of dirt or loam is quite sufficient to materially deteriorate the strength of a concrete, and too much stress cannot be laid upon the necessity for seeing that all aggregates are free from any foreign dirty matter. A case of structural failure came under the notice of the author a short time back, in which the cement used was perfectly good, but the finer portions of the aggregate consisted of very fine sand, so fine that 60 per cent. passed through a sieve having seventy holes per lineal inch, and 80 per cent. through a sieve having fifty holes per lineal inch. The structure of which it formed part had to bear a considerable thrust, and to aggravate matters, instead of this sand being properly mixed, large patches occurred in which there was no cement at all. In addition to this, the sand contained a considerable portion of loam or foreign matter, and it is not to be wondered at that failure resulted.

The neglect of the proper cooling or aeration of a cement is a frequent cause of trouble, and to insure satisfactory work proper cooling cannot be too strongly insisted upon. Of course cement may give good results when used hot from the mill, and the author has manufactured cement which has turned out satisfactorily under these conditions, but to use cement in this state is to court failure. It is sometimes specified that the manufacturer shall store the cement in his warehouse at a stated thickness of, say 3 feet, for a certain period, and have it turned over three or four times at regular intervals before being supplied for use, but if this had to be done with the entire output of every factory it would necessitate an enormous increase in warehouse room, to cover the first cost of which would entail a largely-increased price to the consumer. It is there-

fore advisable, where cement is being used in considerable quantities, to construct temporary cooling sheds, with a good dry boarded floor, where the cement can be turned out of the sacks or barrels and thoroughly aerated before use. It is sometimes contended that the cement, even if shipped hot, cools sufficiently during transit. Although it undoubtedly does cool to a certain extent, it is doubtful if, when tightly packed in barrels, or closely stowed in sacks, it cools sufficiently to allow of its being immediately used with safety.

The exposure to extremes of temperature has perhaps more to answer for in the shape of unsatisfactory work than is generally recognised. If exposed to a summer sun immediately after being gauged, naturally a great deal of the necessary moisture is evaporated, leaving the cement without sufficient to complete the crystallisation already set up. The result frequently is that the work crumbles, and shows signs of failure. On the other hand, exposure to frost acts on the water, and by expansion, destroys the surrounding concrete. The author once had occasion to investigate a case of failure in which frost was the undoubted cause of the mischief, as there was no fault to be found either with the cement, aggregate, or manner of manipulation. The concrete flooring of an outhouse in some new farm buildings was commenced late in December, and left partly completed owing to the Christmas holiday. As frost set in with unusual severity during the interval, the work was not revisited until the return of milder weather, three or four weeks afterwards, when it was found that that portion which was laid immediately before the frost was utterly destroyed, while the portion previously laid, which had sufficiently hardened to prevent total destruction, showed signs of flaking on the top where it had been floated or trowelled. In this case the cement had to bear the blame, although the destroyed portions, afterwards relaid with the same materials, gave perfectly satisfactory results. During severe weather, therefore, proper precautions should be taken to protect freshly-laid concrete from the effects of frost.

A matter which has lately attracted a large amount of attention, among those interested in the English cement industry, is the use of admixtures with the Portland cement clinker after calcination. At a meeting of manufacturers held on November 12, 1894, for the purpose of forming an English Cement Makers' Association, this matter of admixtures was brought forward, and one manufacturer boldly averred that a certain admixture improved the quality of Portland cement, and that his firm had therefore adopted it in their ordinary manu-

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facture. As the outcome of this meeting the cement trade section of the London Chamber of Commerce took the matter up, and a committee has been appointed to investigate the question.

The one material about which the controversy chiefly rages is Kentish rag, a limestone of varying composition found near Maidstone. From samples of cement containing a certain addition of this limestone, which have been sent to the author for testing in the ordinary course, the results by the usual methods of mechanical testing compare favourably with average English cements, even when gauged with three parts of standard sand, though of course what results they would give without the admixture he has had no opportunity of judging. He has, however, instituted a considerable series of experiments on the subject, extending over a lengthy period, and when these are completed he will be able to speak more definitely on the matter.

The same question of admixtures arose in Germany a few years back, where adulteration was then largely practised, and the results of experiments, carried out under the auspices of the German Cement Makers' Association, seemed to prove that admixtures of any sort detrimentally affected the cement, and, as a consequence, a resolution was passed by which the members of that Association bound themselves not to use any admixture whatever, an exception being made in the case of gypsum, of which 2 per cent. was allowed to regulate the time of set. On the other hand, Professor Tetmajer, of Zurich, obtained very different results from those of the German Association. With certain admixtures he obtained equally good and in some cases better results than with the pure cement.

Until, therefore, we have more conclusive independent evidence in their favour, it seems questionable whether admixtures of any sort are desirable. As, however, such admixtures, and more especially Kentish rag, are easily detected by analysis, the user, at all events, has it in his power to discriminate between the ordinary calcined product and that containing an admixture.

To summarise the preceding remarks, apart from the question of admixtures, the chief points requiring attention in the use of cement in order to obtain the best results are the following:—1. Sound, well-ground cement of steadily-increasing strength; 2, due attention to the setting properties of the cement; 3, clean, well-proportioned aggregate; 4, proper maturing of the cement before use; 5, protection from extremes of temperature. In conclusion, the author ventures the opinion

that if the above points always received the amount of attention due to their importance, failures in cement-work, apart from defective design, would very rarely be heard of, and if the statements made in this paper, based as they are on personal experience, lead to a better general knowledge of the properties and capabilities of Portland cement, its object will be amply fulfilled.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 6631. William Willis, for "Improvements in flushing cisterns."
- 6645. Thomas Wilkinson Mason and Daniel Binks, for "The combination sanitary water-closet seat."
- 6686. Charles Bristow, for "Surveyor's roadside ruler."
- 6809. Arthur Nicholls and Anthony Boiston, for "Invisible door-springs and checks."
- 6830. James Stanley, for "Improvements in window-sash fastenings."
- 6860. Robert James Irving and John Bell Irving, for "Improvements in or appertaining to gates, doors or the like."
- 6902. John Edward Lucas, for "Improvements in locks (mortise and others) or latches."
- 6907. Frank Smith and Charles Gray Smith, for "Improvements in locks and bolts."
- 6994. Harvey William Lardner, for "Improvements in gate fastenings."
- 7055. Amos Fisher, for "Self-acting burglar-proof window fastener."

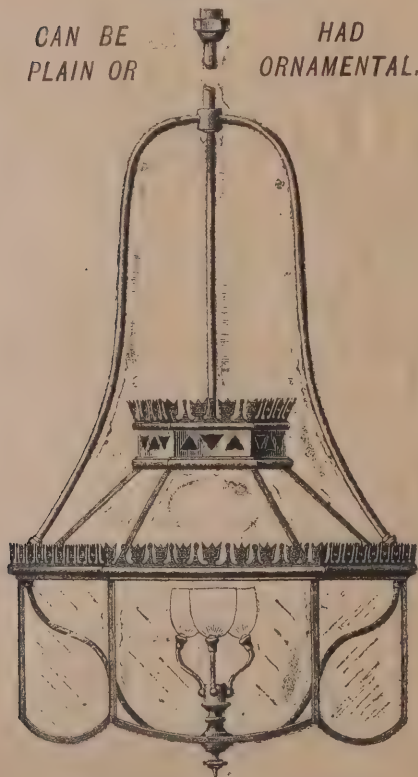
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SPECIAL NOTICE TO THE TRADE AND OTHERS.

[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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* * As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

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COMPETITIONS OPEN.

KIRKCALDY.—May 1.—Plans are invited for proposed Infectious Diseases Hospital. Town Clerk, Kirkcaldy.

LLANELLY.—May 15.—Elevations and Plans are invited for proposed School. Mr. Fred. Nelson Powell, Clerk to the Managers of the Llanelly Intermediate and Technical Schools, Llanelly.

CONTRACTS OPEN.

BRISTOL.—May 1.—For Erection of Banking Premises. Mr. G. M. Silley, 17 Craven Street, W.C.

CAVERSHAM.—May 3.—For Construction of Sewerage Works. Mr. Nicholson Lailey, Engineer, 16 Great George Street, Westminster, S.W.

CHISWICK.—May 1.—For Erection of Seven Shops and Dwelling-houses. Messrs. F. & W. Stocker, 90 Queen Street, E.C.

CITY OF LONDON.—April 30.—For the Construction of Underground Conveniences in Circus Place, Finsbury, and Cannon Street. Mr. H. Montague Bates, Tenders Office, Guildhall.

CITY OF LONDON.—May 7.—For Performance of Carpenters' Work for a Period of Three Years. Mr. H. Montague Bates, Guildhall.

CITY OF LONDON.—May 7.—For Performance of Painters and Plumbers' Work for a period of Three Years. Mr. H. Montague Bates, Guildhall.

CITY OF LONDON.—May 7.—For Performance of Engineers' Work for a Period of Three Years. Mr. H. Montague Bates, Guildhall.

DOVER.—April 30.—For Lavatories and Urinals. Mr. H. T. Gradon, Architect, 22 Market Place, Durham.

DULWICH.—May 7.—For Formation of New Road. Mr. Charles Barry, 1 Victoria Street, S.W.

EDGWARE.—April 29.—For Erection of School, with Offices, &c. Mr. C. W. Carrell, Broadway, Stratford.

FINCHLEY.—April 29.—For Providing Gasfittings at New Infant School. Mr. Henry Stevens, 22 Bedford Row, W.C.

FOLKESTONE.—April 29.—For Erection of School of Science and Art. Mr. Frank Newman, 4 Bouverie Square, Folkestone.

FULHAM.—May 2.—For Erection of a Staff Block for Female Domestic, Additions and Alterations to the Male Staff Block and to the Nurses' Ambulance Block, and other Works at the Western Fever Hospital, Seagrave Road. Messrs. A. & C. Harston, 15 Leadenhall Street, E.C.

GRAVESEND.—May 14.—For Erection of Municipal Offices. Mr. A. G. Smith, M.S.A., 1 Darnley Street, Gravesend.

HAMPTON WICK.—April 30.—For Supply of 350 Tons of Belgian or other Granite, and 350 Yards of Kentish Brown Flints. Mr. J. Nixon Horsfield, F.S.I., Hampton Wick.

HOPWAS.—April 30.—For Enlargement of Schools. Mr. Thomas Johnson, The Hollies, Hopwas, near Tamworth.

HULL.—April 26.—For the Erection of Additional Buildings at the Borough Asylum. Mr. T. G. Milner, Borough Treasurer, Town Hall, Hull.

KENDAL.—May 7.—For Excavating, Quarrying, Embanking, Pipe-laying and Other Work, and for Providing certain Plant and Delivering certain Stone, Concrete, Cast-iron Pipes, Stoneware Pipes and Other Materials required in Connection with the Formation of a Reservoir at Fisher Tarn, near Kendal, and with the Works for Conveying Water to and from such Reservoir. Mr. Christopher Graham, Highgate, Kendal.

LONDON.—May 1.—For Building Seven Shops and Dwelling-houses, Gordon Estate, Chiswick High Road. Messrs. F. & W. Stocker, Surveyors, 90 and 91 Queen Street, Cheapside, E.C.

MANCHESTER.—May 8.—For Fixing Sanitary Fittings at Town Hall. Mr. T. de Courcy Meade, Town Hall, Manchester.

MANCHESTER.—May 8.—For Providing and Fixing Ranges of Sanitary Fittings in Philip's Park and Queen's Park. Mr. T. de Courcy Meade, Town Hall, Manchester.

MANSFIELD.—May 1.—For Erection of Probation Wards at Workhouse. Mr. R. F. Vallance, F.R.I.B.A., Mansfield.

RAYLEIGH.—April 30.—For Erection of House and Stable. Mr. James Thompson, Southend-on-Sea.

SANDWICH.—May 1.—For Supply of 270 Tons of 1½-inch Blue Guernsey or Alderney Granite, and 30 Tons of Granite Siftings. Mr. A. J. Catt, St. Peter Street, Sandwich.

SEVENOAKS.—May 4.—For Levelling, Metalling, Kerbing, Graveling, Channelling and Making Good of the Bradbourne

Park Road and Laying of Stoneware Pipe Sewers, with Man-holes, Lampholes, Gullies and other Works connected therewith. Mr. Jabez Mann, C.E., Urban Council Offices, Argyle Road, Sevenoaks.

SHEFFIELD.—April 29.—For Erection and Completion, above the present ground level, of a Block of Buildings, comprising Engine and Exhauster House, Meter House, Workshops, Stores, &c. Mr. Fletcher W. Stephenson, Sheffield United Gas Light Company, Commercial Street, Sheffield.

SOMERSET.—April 30.—For Additions, &c., to Bleadon and Uphill Railway Station. Mr. G. K. Mills, Secretary, Paddington Station, W.

SOUTHWARK.—April 26.—For Repairing and Repainting Roof over North Side of Borough Market. Messrs. James & Son, 29 Trinity Square, S.E.

SUTTON.—May 6.—For Internal Cleansing, Distemping, Colouring, Painting, &c., of the Several Blocks of the Girls' School, Banstead Road, Sutton, Surrey. Mr. Dennett, South Metropolitan District School, Brighton Road, Sutton, Surrey.

TOTTENHAM.—April 30.—For Making-up several Roads. Mr. P. E. Murphy, 712 High Road, Tottenham.

TUNBRIDGE WELLS.—April 26.—For the Erection of a Post Office. Messrs. Lee & Sons, 35 Craven Street, W.C.

WALTHAMSTOW.—April 26.—For Supply of 1½-inch Broken Granite. Mr. G. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow.

WEST HAM.—May 7.—For Gas Engineering and Fittings required at the Credon Road Schools, Upton Park, and Pupil Teachers' Centre, Russell Road Schools, Custom House, E, now in Course of Erection. Messrs. J. S. Newman & Jacques, 2 Fen Court, E.C.

WEST HAM.—May 14.—For Two Beam Pumping-Engines, each about 250 Indicated Horse-power; Two Centrifugal Pumps and Engines, each about 350 Indicated Horse-power; Four Boilers, each 30 Feet in Length by 7 Feet 6 Inches in Diameter; also Alterations to Existing Centrifugal Pump, Engine and Boilers and Other Works. Mr. Lewis Angell, Town Hall, Stratford.

WELLINGBOROUGH.—May 7.—For Execution of Sewage Works, Consisting of 18-inch Outfall Sewer, Screening Chamber, Storage Tanks, Engine House, Boiler House, Coal Store, Fitting Shop, Chimney and Pumping Plant,

12-inch Cast-iron Pumping Main, Irrigation Mains, and Fittings, &c., for the Necessary Irrigation Works. Mr. J. T. Parker, 29 Church Street, Wellingborough.

WESTMINSTER.—May 10.—For Rebuilding West Block of Workhouse. Messrs. J. Waldram & Son, 13 Buckingham Street, W.C.

WILLESBOROUGH, KENT.—May 3.—For Deepening the Well at Workhouse. Mr. A. J. Burrows, F.S.I., 41 Bark Street, Ashford.

TENDERS.

CARDIFF.

For Levelling and Draining Ground and Building Penstock and Inspection Chambers in Cardiff Arms Park, for the Cardiff Football Club. Messrs. J. P. JONES, RICHARDS & BUDGEN, Surveyors, 18 St. Mary Street, Cardiff.

D. Jenkins, Swansea	£1,600	0	0
F. Ashley, Cardiff	1,530	8	10
E. F. Richards & Co., Barry	1,388	0	0
A. Berridge, Cardiff	1,379	15	0
H. Davies, Cardiff	1,348	9	0
Barnes, Chaplin & Co., Cardiff	1,291	8	8
Knox & Wells, Cardiff	1,100	0	0
J. Allen, Cardiff	1,069	0	0
T. R. WATERMAN, Cardiff (accepted)	990	0	0
A. M. Scott, Cardiff	911	10	0
J. Gibson, Cardiff	775	0	0

CARLISLE.

For Extension of Board School, Brook Street, Carlisle. Mr. T. TAYLOR SCOTT, Architect.

W. & H. Davidson, builder.

W. Lattimer, joiner.

J. Hewitson, slater.

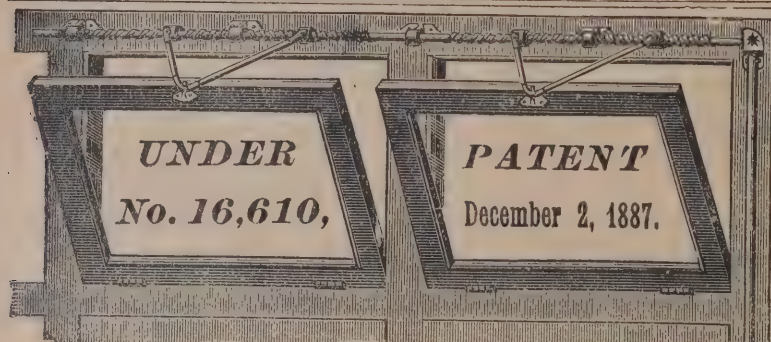
R. M. Hill & Sons, plumber.

R. M. Ormerod & Son, plasterer.

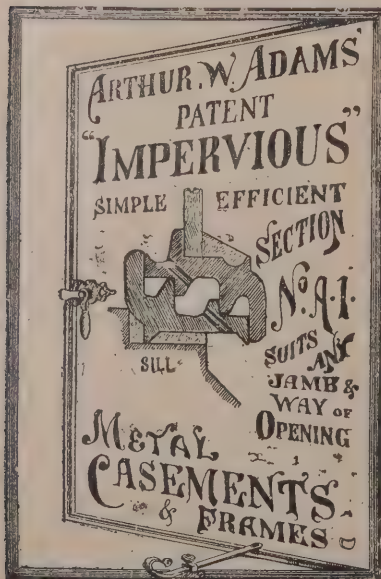
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E. Brown & Son, Wellingborough	£99 10 0
S. Abbott, Finedon	89 0 0
G. Henson, Wellingborough	69 10 0
T. CHAPMAN, Finedon (accepted)	69 0 0

FRISTON.

For the Erection of a New Board School, Friston, Suffolk. Mr. J. T. WRIGHT, 9 The Prairie, Lowestoft.

C. Rice, Elmswell	£1,155 0 0
G. Kenny, Ipswich	1,139 0 0
W. T. Smith, Woodbridge	903 0 0
G. Barrell, Woodbridge	894 16 0
Cutting & Sons, Saxmundham	845 0 0
Gibbs & Son, Saxmundham	839 0 0
Cooper & Son, Aldeburgh	799 0 0
F. POOLEY, Leiston (accepted)*	712 0 0

* Accepted subject to the approval of the Education Department.

GILFACH GOCH.

For Building Thirteen Cottages at Gilfach Goch. Messrs. GRIFFITHS & JONES, Architects, Town Hall Buildings, Tonypandy.

R. Francis, Morriston	£3,055 0 0
Rattery & Jenkins, Ogmores Vale	2,470 0 0
D. Evans & Sons, Penygraig	2,360 0 0
E. THOMAS, Tonyrefail (accepted)	2,145 0 0

GLASGOW.

For Building Labourers' Dwellings in Kirk Street, Calton, for the Glasgow Town Council.

Thaw & Campbell, masonwork	£1,280 16 5
Hugh M'Taggart, carpenter and joinerwork	567 13 8
Hamilton & Co., plaster and cementwork	157 19 0
Matthew Sproul, plumber and gasfitterwork	118 12 1
W. D. Horne, painterwork	52 8 5
John M'Ouat & Son, slaterwork	45 0 0

Total . . . 2,222 9 7

HEREFORD.

For Construction of Bridge in Blue Brickwork and Masonry across the Little Rugg River, near Hereford, for the Roads and Bridges Committee of the Herefordshire County Council. Mr. HENRY T. WAKELAM, County Surveyor.

Quantities by the Surveyor.

D. Smith, Ledbury	£569 0 0
Stone Bros., Fownhope	540 6 0
Bowers & Co., Hereford	540 0 0
W. P. Lewis & Co., Hereford	509 13 3
J. Preece, Marden	493 13 2
ANDREWS & SON, Hereford (accepted)	487 19 0

KETTERING.

For Building Shoe Factory, Kettering. Mr. H. NORWOOD, Architect, 87 Broadway, Kettering.

Contract No. 1.—Bricklayer, Mason and Carpenter.

P. J. Dunham	£1,145 0 0
G. Wilson	975 0 0
Andrew & Judkins	942 10 0
Johnson & Manton	920 0 0
J. H. HART (accepted)	848 0 0

Contract No. 2.—Ironwork.

The Glendon Iron Co.	135 19 0
SALMON & CO. (accepted)	116 12 6
Dixon & Fish	114 10 0

Contract No. 3.—Plumber and Glazier, Painter and Gas-fitter.

STANLEY & SPENCE (accepted)	228 14 6
E. Nichols	225 0 0
H. P. Hodge	160 0 0

KIRKCALDY.

For Construction of Sewers, including Cast-iron Outlet Pipes, &c, for the Local Authority. Mr. JAMES L. LUMSDEN, Burgh Surveyor.

D. Whyte, Kirkcaldy	£2,579 5 8
J. Kennedy, Kirkcaldy	2,310 8 10
G. Smith & Sons, Kirkcaldy	2,300 0 0
W. Carragher, Dunfermline	2,046 2 6
A. Gray & Co., Kirkcaldy	1,987 19 3
J. Martin, Dunfermline	1,997 7 2
R. C. Brebner, Edinburgh	1,983 5 8
L. & W. McDonald, Inverkeithing	1,883 4 6
J. Stevens, Buckhaven	1,876 7 1
Mackay & Son, Stirling	1,838 3 6

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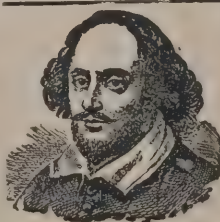
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W. Thomas	£64	5	0
D. Evans	64	2	0
R. Williams	63	8	0
J. James	62	3	0
B. MORRIS & SON, Llandilo (accepted)	60	12	0

For Alterations to Nos. 30 and 31 New Road, for Mr. D. E. WILLIAMS, Hosier. Mr. DAVID JENKINS, F.R.I.B.A., Architect.

D. Stephens	£55	0	0
W. Michael	52	0	0
D. Evans	51	0	0
D. JONES, Llandilo (accepted)	38	0	0

For Stable and Repairs to the Castle Hotel, for Mrs. Bowen. Mr. DAVID JENKINS, F.R.I.B.A., Architect.

Thomas Bros.	£257	0	0
D. Stephens	256	0	0
D. Evans	249	0	0
D. JONES, Llandilo (accepted)	203	10	0

LLANTRISANT.

For Renovation of Llantrisant Welsh Methodist Chapel, Building a Schoolroom, &c.

Williams & Co., Pontypridd	£94	0	0
Rattray & Jenkins, Pontycymmer	91	0	0
C. MORGAN & E. LLEWELYN, Llantrisant (accepted)	91	0	0

LONDON.

For Alterations to the Sir Robert Peel Public-house, Malden Road, Kentish Town, for Mr. A. W. Ritchie. Mr. ALBERT E. PRIDMORE, M.S.A., F.S.I., Architect, 2 Broad Street Buildings, E.C.

E. Pearce	£285	0	0
Antill & Co.	245	0	0
W. J. Wiltshire	230	0	0
S. R. Lambie	219	0	0
Marchant & Hirst	179	0	0
London & Co.	169	0	0
Hayworth Bros.	168	0	0

LONDON—continued.

For Alteration at The Yarmouth Arms Public-house, Lower Thames Street, London, E.C. Mr. HERBERT RICHES, Architect, 3 Crooked Lane, King William Street, E.C.

W. Harper	£154	0	0
T. OSBORN & SONS (accepted)	152	10	0

For Works at The Prince of Wales Public-house, Camridge Heath, London, E. Mr. HERBERT RICHES, Architect, 3 Crooked Lane, King William Street, E.C.

T. OSBORN & SONS (accepted)	£153	10	0
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For Erection of a Warehouse, Great Saffron Hill, for Messrs. G. W. Munt & Sons. Mr. WIMBLE, Architect.

Hall, Beddall & Co.	£2,600	0	0
Ashby & Horner	2,570	0	0
Colls & Sons	2,563	0	0
Scrivener & Co.	2,537	0	0
E. Toms	2,462	0	0
E. Lawrance & Sons	2,455	0	0
Killby & Gayford	2,440	0	0

For Alterations and Repairs, 29 Osborne Street, Brick Lane, E., for Mr. T. Kendon. Mr. JOSEPH G. NEEDHAM, Architect, 11 Powerscroft Road, Clapton.

H. Wendon	£470	0	0
Coulsell Bros.	383	0	0
J. Cooper	369	0	0
W. Wells	355	0	0
H. Hood	344	0	0
E. LANCASTER (accepted)	338	0	0
Architect's estimate	340	0	0

MORLEY.

For Pulling-down and Re-erecting Three Houses and Shops, Queen Street, Morley, for Messrs. W. & E. Jackson. Mr. T. A. BUTTERY, Architect, Queen Street, Morley.

D. MARSDEN, Commercial Street (accepted)	£562	0	0
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NEWPORT.

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Dick, Kerr & Co, London	£2,643	0	0
A. E. Parfitt, Newport	2,430	0	0
A. S. Morgan & Co., Newport	2,322	0	0
A. KRAUSS, Bristol (accepted)	2,168	0	0
J. Briggs, Birmingham	2,137	6	8
Engineer's estimate	2,280	0	0

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J. Reed & Co., Newcastle-on-Tyne . . .	1,576	0	0
J. Sutton, Newcastle-on-Tyne . . .	1,567	14	11
C. W. King, Newcastle-on-Tyne . . .	1,538	15	5
R. Veitch, Newcastle-on-Tyne . . .	1,501	18	7
J. C. Hope, Newcastle-on-Tyne . . .	1,465	17	0
J. Lunn, Newcastle-on-Tyne . . .	1,440	0	0
T. & R. LAMB, Gateshead (accepted) . . .	1,370	18	8
G. T. Bryce, Newcastle-on-Tyne . . .	1,349	2	0
Turner Bros., Gateshead . . .	1,308	9	0

NEW BASFORD.

For Building Two Pairs of Semi-detached Houses on the Springfield Grove Estate, New Basford, Nottingham. Mr. A. H. GOODALL, Architect, Market Street, Nottingham.

Hoyes & Boyfield, Nottingham . . .	£1,560	0	0
Gilbert & Gabbitass, Nottingham . . .	1,525	0	0
A. B. Clarke, Nottingham . . .	1,500	0	0
J. Attenborrow, Nottingham . . .	1,450	0	0
J. J. Adams, Nottingham . . .	1,436	4	0
L. Green, Hucknall Torkard . . .	1,407	0	0
R. Fisher, Nottingham . . .	1,398	0	0
T. Whittaker, Nottingham . . .	1,398	0	0
A. G. Bell, Nottingham . . .	1,392	0	0
H. Andrew, Nottingham . . .	1,363	0	0
W. Gell & Son, Nottingham . . .	1,360	0	0
T. Cuthbert, Nottingham . . .	1,355	12	0
B. Keeling, Nottingham . . .	1,350	0	0
J. Cooper, Nottingham . . .	1,350	0	0
J. Wheatley, Nottingham . . .	1,340	0	0
G. Caulton, Nottingham . . .	1,322	0	0
G. T. Lovett, Nottingham . . .	1,307	7	6
W. Pinkett, Bulwell, Nottingham . . .	1,300	0	0
F. Evans, Basford, Nottingham . . .	1,295	0	0
J. Oseroff, Nottingham . . .	1,292	0	0
H. Scott & Son, Nottingham . . .	1,290	0	0
F. Wartnaby, Nottingham . . .	1,283	0	0
Appleby & Lambert, Nottingham . . .	1,282	0	0
G. A. Pillatt, Nottingham . . .	1,270	0	0
W. Maule, Nottingham . . .	1,267	0	0

NORWICH.

For Rebuilding Workhouse Dining Hall, Norwich.

Highest Tender . . .	£356	0	0
S. CHAPMAN & SON (<i>lowest and accepted</i>) . . .	239	10	0
Architect's estimate . . .	250	0	0

PENISTONE.

For Additions to Workhouse Infirmary, Penistone, for the Board of Guardians. Mr. G. A. WILDE, Architect, Bank Street, Sheffield.

A. WAINWRIGHT, Thurlstone (<i>accepted</i>) . . .	£1,130	0	0
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PORTSMOUTH.

For Enlargement of Portsmouth Head Post-office, for H.M. Commissioners of Works, &c.

J. Goad & Co., Plymouth . . .	£7,239	10	0
H. Clark & Sons, Landport . . .	6,340	0	0
W. Ward, Portsmouth . . .	6,332	0	0
J. H. Corke, Southsea . . .	5,918	0	0
W. R. LIGHT & SON, Portsmouth (<i>accepted</i>) . . .	5,893	0	0

Old Materials.

J. H. Corke . . .	65	8	3
W. R. LIGHT & SON (<i>accepted</i>) . . .	53	0	0
H. Clark & Sons . . .	48	0	0
J. Goad & Co. . .	46	10	0
W. Ward . . .	45	0	0

RATHMINES.

For Supply of Rivetted Steel Pipes, 27 Inches Diameter, for the Commissioners.

A. & J. Steward & Clydesdale (<i>lap-welded</i>) . . .	£230	0	0
Bellamy, London . . .	192	0	0
O. S. Robinson, Dublin . . .	184	0	0
Lloyd & Lloyd, Liverpool . . .	164	0	0
Vulcan Ironworks, Glasgow . . .	161	3	6
Maguire, Dublin . . .	156	10	0
Cadle . . .	154	0	0
Meehan & Sons, Glasgow . . .	153	10	0
F. Morton & Co., Liverpool . . .	140	0	0
J. LYSAGHT, Bristol (<i>accepted</i>) . . .	125	0	0

STOCKTON.

For Restoration and Additions to Stockton Church, York. Messrs. NAYLOR & SALE, Architects, Derby and Lincoln.

J. M. THOMPSON & SONS, Louth (<i>accepted</i>) . . .	£1,925	0	0
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S. Kavanagh, Surbiton Hill	£1,217	15	8
W. Langridge, Croydon	1,185	0	0
E. Iles, Mitcham Common	1,173	0	0
STREETER BROS., East Croydon (accepted)	1,044	7	0

WOLVERHAMPTON.

For Building Malting and Premises at Wolverhampton, for the Wolverhampton and Dudley Breweries, Limited. Mr. J. D. WOOD, Architect.

H. Lovatt, Wolverhampton	£6,384	0	0
M. Hughes, Birmingham	5,971	0	0
Gowing & Ingram, Birmingham	5,900	0	0
J. Dallow, Blackheath	5,850	0	0
E. Giles, Birmingham	5,800	0	0
Harley & Son, Smethwick	5,787	0	0
T. Tildesley, Willenhall	5,625	0	0
G. Hodges, Burton-on-Trent	5,600	0	0
Guest & Son, Stourbridge	5,550	0	0
C. A. Horton, Brierley Hill	5,453	0	0
A. Lynex, Walsall	5,450	0	0
Lowe & Sons, Burton-on-Trent	5,395	0	0
WILLCOCK & CO., Wolverhampton (accepted)	5,315	0	0

The Leeds Mercury says a statement was submitted at a meeting of the Leeds gas committee, showing that during the year 1894 there had been a profit on the gasworks of about 36,000%. When the accounts are made up for the Corporation financial year, which ended the 25th of last month, even a greater profit, it is expected, will be shown. The surplus will not only enable the committee to pay off a debt of 31,000%, but leave them with a small sum in hand. Remembering that by the abolition of gas-meter rents a source of income that amounted to something like 11,000% has been sacrificed, the news of this large profit will come as a pleasant surprise to many.

BUILDING AND BUILDERS.

At the Edinburgh Dean of Guild Court were eighteen applications for warrants for new buildings or alterations on existing structures. Eleven of these were granted. They included warrants to Mr. Robert Croall for the erection of office, store and carriage shed at Middlefield, to Mr. James Miller for a double villa at Hermitage Gardens, and to Mr. James Anderson for a tenement of houses at Bothwell Street.

At a meeting of carpenters and joiners at Manchester it was announced that the masters in the building trade had conceded an increase of a halfpenny an hour, and a reduction of hours from 52 to 49½ per week, the alterations to come into force on June 1. Several minor points were left for decision by a committee representing both sides, but the employers decline any concessions as to walking time, grinding time and the question of notice otherwise than in accordance with present rules.

At the annual meeting of the Whiston Rural District Council a sewage scheme for Whiston was considered, and the clerk was instructed to get estimates for the work, to cost about 2,000%.

At the meeting of the Glasgow Town Council plans for the erection of additional tenements on the balcony system, proposed to be erected in Mason Street and Collins Street, were approved, and tenders for the work ordered to be obtained.

THE construction of a new bridge over the river Dee, between Queensferry and the Cheshire side, which is to cost 13,000%, commenced on Monday. Mr. T. K. Irwin, of Hurnsworth-on-Tees, has been appointed clerk of the works. The contractors for the work are the Teeside Waggon and Engineering Company.

THE annual dinner of the Brighton master builders took place at the Hôtel Métropole, the mayor, Mr. W. Botting, presiding. The relations between the masters and the operatives seem from the report to have been mutually satisfactory, though agitators have apparently tried to create discordance.

MR. JAMES BIRTWISTLE, the architect for the municipal buildings at Preston (Victoria), being dissatisfied with the workmanship, material and delay of the contractor, and having been informed to that effect, has determined the contract. Mr. Birtwistle wrote to the building committee of the Shire Council notifying determination of contract and his reasons for so doing. The architect has since called for tenders for the Preston municipal buildings at the risk of the former contractor.

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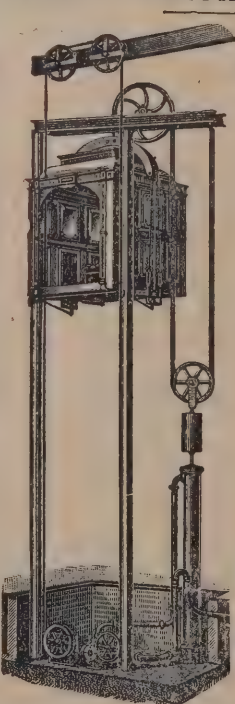
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ELECTRICAL.

THE acquisition by the Liverpool Corporation of the Electric Light Supply Company's undertaking for 400,000 $\frac{1}{2}$ has been practically determined upon by the special lighting committee, who have authorised a thorough examination of the property and the financial position of the company prior to entering into an agreement.

AT Worcester an official inquiry has been held respecting the application of the City Council for sanction to borrow 20,230 $\frac{1}{2}$, for purposes of electric lighting. It was stated that the Local Government Board had already sanctioned the applications of the Council to borrow some 41,000 $\frac{1}{2}$. The additional money was required for additional work and extras, which were explained by the city surveyor.

AT a meeting of the Society of Arts, Mr. R. E. Crompton, president of the Institution of Electrical Engineers, read a paper on "The Use of Electricity for Heating and Cooking," Mr. H. Preece occupying the chair.

THE cable for lighting Ayr with electricity is now well laid in Mill Street, High Street and Sandgate Street. Main Street, Newton, is yet to be done. Several of the principal merchants have arranged to take in the light.

SEVERAL influential gentlemen in Ayr and district have under consideration a proposal for the construction of an electric tramway from Prestwick and Ayr to Burns's Cottage and Monument.

TRADE NOTES.

THE streets and buildings committee of the Edinburgh Town Council have accepted the estimate of Mr. John Waddell, amounting to over 5,000 $\frac{1}{2}$, for the construction of the subway between Dalry and Fountainbridge.

TO avoid delay in the construction of the projected open-air baths in Burlington Street, Liverpool, the finance committee of the Corporation have authorised the baths committee to select the contractor and proceed with the work, subject to the approval of the Local Government Board and the City Council.

A NEW eight-day turret clock, showing the time upon four external dials painted and gilt, and striking the hours on a large bell, has been presented to the parish church, Benwell-on-Tyne, by Mr. Walter Scott, the necessary work having

been done by Messrs. Wm. Potts & Sons, clock manufacturers, of Leeds, and Collingwood Street, Newcastle-on-Tyne, from instructions from the architects, Messrs. Hicks & Charlwood, 42 Grainger Street, Newcastle-on-Tyne.

THE new extensions to the Wigan Infirmary are being warmed and ventilated by means of Shorland's patent double fronted Manchester stoves, with descending smoke flues and patent Manchester grates, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

THE quarterly meeting of the London and Provincial Foremen's Association will be held to-morrow (Saturday) at the Memorial Hall, Farringdon Road, E.C., when the adjourned discussion on "Past and Present Apprenticeship" will be resumed.

AT the meeting of the Bath Pump Room committee, eleven tenders were received for the work of the Pump Room extension. The tenders ranged from 18,138 $\frac{1}{2}$ of Messrs. J. Long & Sons, Bath, to 26,190 $\frac{1}{2}$ of Messrs. Dounes, of London, and the former was accepted.

ACCORDING to *Bric-à-Brac* the latest addition to Palmer's Museum in the Strand is a great curiosity in stamps. The description as it appears in *Bric-à-Brac* is lengthy, and no justice could be done to it by an abstract.

VARIETIES.

A FIRE has taken place in Dundee at the works of Messrs. Grimonds, manufacturers. The damage is estimated at 10,000 $\frac{1}{2}$, which includes 7,000 $\frac{1}{2}$ for jute, the building and material being insured. The main buildings, owing to fireproof partitions, have been protected to a great extent.

AN inquiry has been held at the Salford Town Hall into an application by the Corporation for power to borrow further moneys not exceeding 100,000 $\frac{1}{2}$ for the purpose of their gas undertaking.

A REMARKABLE change has recently been effected in the appearance of the fine old parish church of St. Stephen's-by-Saltash, the vicar having taken in hand the much-needed restoration of the lofty tower and other parts of the structure. The work has been carried out by Mr. A. Carkeek, of Redruth, in accordance with specifications prepared by Mr. George Fellowes Prynne, architect.



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A MEETING has been held in Bradford to discuss the advisability of establishing a Yorkshire Society of Painters in Water-Colours, not in opposition to the present Union of Yorkshire Artists, for it is considered that the taste for water-colour paintings will be better cultivated by a society which exists for that alone rather than one which, as does the Union, concerns itself with both oil and water-colours.

At the meeting of the East of Scotland Engineering Association, Mr. Wm. Simpkins, C.E., president, in the chair, a paper on "Road Subventions" was read by Mr. J. Robb, assistant county road surveyor. After giving a sketch of the system of road maintenance and administration in Scotland prior to the adoption of the Roads and Bridges Act, 1878, the question of subvention as affecting the city of Edinburgh and the county of Mid-Lothian was discussed in detail. It was stated that the increase of traffic on county roads had far exceeded what was anticipated on the abolition of tolls, more especially in the case of pleasure-driving from towns, and it was contended that the application of the principle of tolls, whereby the user of the road should pay for its upkeep, was the simplest way of determining the use made by burgh communities of the roads in the neighbourhood.

At the quarterly meeting of the Birmingham Tame and Rea District Drainage Board, the estimates of income and expenditure for the year commencing March 26 last were adopted. The total amount required was 34,448*l.*, an increase of 40*7*/₁₀₀ on the preceding year. Resolutions were adopted for the purchase of two plots of land in the Tame Valley in order to enlarge the Saltley Sewage Farm, the total cost being 1,075*l.*

It is stated that Lord Penrhyn has decided to remove Talcen Mawr, a huge rocky pinnacle in the centre of his slate quarry, owing to the action of the weather having rendered it unsafe. The rock is being undermined, and in the chambers will be placed seven tons of gunpowder, which Mr. Young, the manager, estimates will displace 125,000 tons of rock. The fuse will be fired at three o'clock to-morrow (Saturday), and it is announced that the public will be admitted free to witness the explosion, subject to regulations to be enforced to insure safety.

THE Urban District Council of Finedon are projecting the complete sewerage and supply of water for the town of Finedon, and at their April monthly meeting instructed Messrs. Mosley & Anderson, of Northampton, to prepare schemes for both to lay before the Council as early as possible.

THE Vienna correspondent of the *Standard*, referring to earthquake shocks at Laibach, says that the official commission appointed to inquire into the damage to the buildings reports that 10 per cent. of the houses will have to be pulled down, that 80 per cent. stand in need of material repairs, and that the remainder are slightly injured—in short, the whole of the town has to be virtually rebuilt.

HER MAJESTY'S Secretary of State for Foreign Affairs has received from Her Majesty's Minister at Mexico a copy of the prospectus of the exhibition of Industries and Fine Arts to be opened in the city of Mexico on April 2, 1896, at which there will be a foreign department, and special Customs exemptions and other facilities are promised to foreign exhibitors. This prospectus may be seen on application to the Commercial Department of the Foreign Department, between the hours of 11 and 6.

AT the annual general meeting of the West of Scotland Iron and Steel Institute, Glasgow, Mr. James Riley, president, in the chair, the report by the Council showed that forty-one members had been admitted during the session, and after allowing for removals from various causes there was a net gain in membership of thirty-one, the total on the roll being 187 members.

AN inquiry has been held at Marple Bridge into the application of the Glossop Dale (Derbyshire) Rural District Council for sanction to borrow 6,000*l.* for works of sewerage and sewage disposal in the township of Ludworth, and also for the approval of the Local Government Board of the formation of a special drainage district in the township.

NEW ROOM AT THE CAFE VERREY.

THE opening on Saturday last at the Café Verrey, Regent Street, of a new room was quite an important function, which was attended by a large gathering of social, literary and artistic celebrities, whose unanimous approval was expressed in the warmest terms, and Messrs. J. & G. Krehl are to be congratulated upon the happy results of their efforts to attain the acme of elegance and comfort. The style adopted for this *ultra chic* resort for lunchers and diners-out is Persian, and combines oriental richness of detail with the Grecian grace of pure architectural form.

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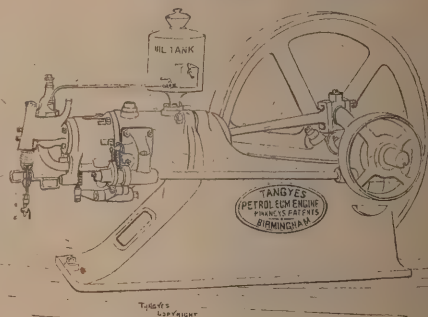
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supporting the main cornice around the room; another intermediate system of smaller circular columns springing from a surbase, support arches, shaped and enriched, which form a pelmet frieze under the main cornice. The constructive portions are finished in old ivory polished lac, the surbase has mottled red translucent glass tiles; the wall space between the surbase and cornice is covered between the columns with velvet, having upon a deep blue ground a foliated pattern in pale turquoise green and old gold colours, affording a soft and most pleasant field of repose to the eye. The central spaces on each wall are fitted with silvered plate-glass and the main cornice has a frieze of deep blue translucent glass tiles recalling the ground colour of the velvet below. The remaining one-third of the wall space above the cornice is occupied by intersecting vaulted arches which spring from the caps of the octagonal columns, and extend forward in a double arched line to support the frame of the central square skylight; these intersecting vaults are finished with beaten metal leaf as oxydised silver, with pale turquoise green and deep blue backgrounds, which display the "all over" design of the relief work. The arched wall spaces between the vaults are all fitted with silvered plate-glass, which produces the pleasing illusion of an open space around the room above the cornice. The enriched ceiling of the central skylight with its side windows, perforated arches and enriched framing is also finished as oxydised silver.

The floor is covered with a deep ruby-red oriental carpet, harmonising exactly in colour with the glass tiles of the surbase. The chairs and tables are of old mahogany, and seats of bluish-green morocco leather. The electric lighting is all sky light, and is arranged in three ascending series, the lowest in the form of pearls within polished lac-white shells with tinted and gilt edges, fixed upon the deep blue glass tiles of the main cornice. The second series are oriental lamps dependent from the three projections of the double vaulting arches, and the third series are in the form of silvered and glass stars around the frame of the central skylight. The designs were prepared by and the work executed under the direction of Mr. Geo. Brown, of Newman Street, W.

A FIRE took place at the Oxford County Lunatic Asylum, at Littlemore. The flames were discovered in the Women's quarters, and the patients, numbering upwards of 300, were immediately conveyed to a place of safety. It was found impossible to save the south wing of the asylum. The damage is estimated at several thousand pounds.

POLYTECHNICS IN LONDON.

In the report of the Charity Commission, the following paragraphs summarise the effects, direct and indirect, of the City of London Parochial Charities Act of 1883 as administered and carried into effect by the Commissioners:—

We proceed to state, in continuation of the information given in our last report, the progress made in the establishment of so many of the nine institutes proposed to be founded by schemes made under the City of London Parochial Charities Act, 1883, as were not completed at the beginning of the past year. Of these nine institutes four are already completed, viz. the Borough Road Polytechnic and the Battersea Polytechnic, opened in January 1894; and the Bishopsgate Institute and the St. Bride's Institute, opened in November 1894. The five remaining institutions are in various stages of progress.

The Cripplegate Institute.—The conveyance of the site of this institute has now been completed, plans of the proposed buildings have been approved by us, and the governors have been authorised to accept a tender for the execution of the work at a cost of 22,801*l.*

The Northampton Institute.—The erection of the institute is proceeding, and a sum of 19,700*l.* has been expended out of a total authorised cost of 34,207*l.*

The South-Western Polytechnic Institute.—The governors have been authorised to accept a tender for the completion of a second section of the building, in accordance with approved plans, at a cost of 9,490*l.*, which, with the cost of the first section previously authorised and now in progress, will make a total expenditure on building of 24,014*l.*

The North-Western Polytechnic Institute.—We have conferred with the governors upon the obligation imposed on them of making some progress towards the establishment of this institute, and it is understood that efforts are being made to secure the freehold of the proposed site.

The Northern Polytechnic Institute.—Plans of the proposed buildings have now been approved by us and the governors have been authorised to accept a tender for the execution of the first two sections of the work at a cost of 15,531*l.* The Clothworkers' Company have arranged for the commutation of an annual grant, promised by them to the institute for thirty years, into a donation of 10,000*l.*, which, with the sum of 7,500*l.* previously contributed by or through the instrumentality of the company, makes a total contribution by them of 17,500*l.*

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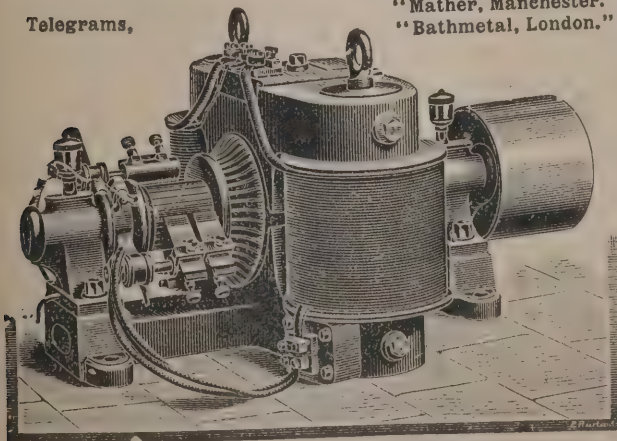


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NEW CATALOGUES.

THE Electrical Power Storage Company, Limited, of 4 Great Winchester Street, are issuing a new illustrated price list, and one in a most convenient form for reference. By a novel arrangement there is no need to search through a table of contents to find a special page. On opening the catalogue at the first page, that which is dealt with on every subsequent page is seen at a glance, and by putting a finger down, the page wanted is immediately opened. The "E. P. S." batteries, cells, &c., are well known, but there are several novelties and improved apparatus now shown in this catalogue. There is also noticeable a considerable reduction in the price of cells, while at the same time there are those of larger size. Also the "Q" type, a cell which they have lately put on the market, and which, owing to its small bulk and weight, is useful for portable purposes. The cell-inspection lamp is a novelty, and is sufficiently thin to go between the plates of the cells, and consequently enables a thorough inspection to be made without removing the plates from the acid. Of the regulating switches a new type is also brought before the trade; it is circular, and consequently very compact, and by utilising the double-circuit switch, as shown, one base is made to do for both charging and discharging circuits. This company has now had fourteen years' experience in the manufacture of storage batteries, and by improvements in design and manufacture, the result of lengthy experiments, they have now been enabled to produce batteries, such as the central station type, which will give 1 kilowatt output for five hours, at list price of about 32%. This, it will be seen, is a considerable reduction

on the prices of a few years ago, when for such an output the cost would have been nearly 50%. The catalogue has a fund of information that we cannot too highly recommend our readers to consult.

WOLVERHAMPTON IRON.

THE new quarter has opened rather more hopefully, as inquiries are brisker and the tone is stronger. Manufacturers announced that the old quarter has resulted in a larger out-turn than was anticipated from the business which was done a month or six weeks ago. Better time is being made at the works on the clearance of orders, but there is a reserve of business that will require attention during the month. The demand is favourably influenced by reason of the larger quantity of material which is desired by district consumers, though these people confine their custom to immediate wants, and they are not disposed to place forward orders. A strong tone characterises the home trade, and some satisfactory indents are furnished by export merchants for several classes of iron made in this district. At present, however, there is no indication of a permanent growth of demand, nor are buyers inclined to place orders even at the present low selling prices for more than will cover their early supplies. The orders being given out are chiefly for bars, sheets, hoops, angles and strip. Various small sizes of iron are also finding rather more custom for immediate delivery; and for steel orders are furnished more regularly than they were several weeks back, mainly for bars, plates, billets and blooms. Stamping-sheet makers are doing a steadier business, and quote former figures. Contracts for pig-iron are withheld, and makers are not looking for much new business, and are putting iron into stock rather than sell at less money; and unless there is more metal wanted several furnaces will be damped out. Current quotations, both for crude and finished iron, show scarcely any alteration.

THE death is announced of Mr. George Daglish, an old and well-known builder, a native of Morpeth. Mr. Daglish was concerned in the erection of many important buildings, and for several years was a member of the Town Council.

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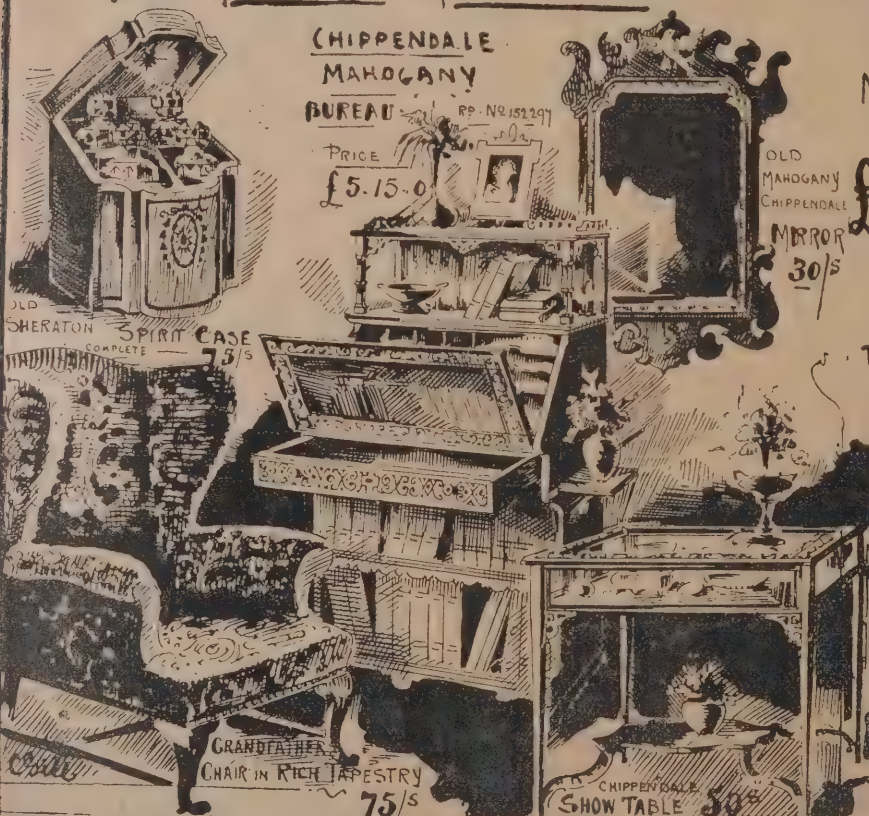
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CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

At the ordinary meeting of this society on Wednesday, April 10, a paper was read on "Laundry Machinery" by Mr. H. Coward, in which he dealt with various forms of washing, wringing and ironing machines, with the drying of linen and the various principles involved in carrying out, in a thorough and satisfactory manner, the proper cleansing of wearing apparel and other articles which are included in the general term of "household linen." A special point of interest in the paper was that of a process of boiling flannel without hardening or prejudicially affecting it, this being done without the use of any chemicals or additions to the water other than those usually employed. Diagrams and models in illustration of the subject were exhibited, and a long discussion ensued in which the president, Mr. C. T. Walrond, A.M.I.C.E., the honorary secretary, Mr. E. H. G. Brewster, A.M.I.C.E., M.I.M.E., &c., Mr. E. Taylor, Mr. A. W. Ackermann, A.M.I.C.E., Mr. R. E. Phillips, A.M.I.C.E., and many others took part.

PLUMBING EXAMINATION.

THE following questions were set for the students of the Sanitary Engineering Section of the Sydney Technical College:—

1. Classify the different sources of water-supply under the following heads:—(a) Wholesome. (b) Suspicious. (c) Dangerous.
2. State the poisonous metals commonly to be looked for in water. Describe their influence upon health, and simple tests for detecting same. Mention the kind of water and the constituents likely to act on lead pipes and cisterns and the special action of hot water and steam in this respect. What are the constituents in water which prevent injurious action in lead vessels or piping?
3. What is the approximate quantity of water required per head for a public water-supply, distinguishing between domestic, manufacturing and public purposes? Give some examples.
4. What are the advantages or disadvantages of constant *v.* intermittent water-supply with regard to usage, pollution and waste?
5. Give a description of the arrangement and purpose of a Deacon's waste-water meter.
6. State the objects of the following fittings:—(a) Loose

valve-cock; (b) waste-not valve; (c) a waste-not system. Describe arrangement and working of any good type of same. Mention any other details of house-plumbing fittings you would consider necessary for the prevention of waste and pollution of a public water-supply.

7. What is the purpose of a storage balance reservoir and service reservoir? Give examples of each.

8. What are the general proportions of an earthen dam—describe the puddle wall and object of same? What is the object of a bywash, and where would you fix it in connection with an earthen dam as compared with a masonry dam? What considerations would guide you in fixing the dimensions of the bywash?

9. In an earthwork dam, in what position would you fix the outlet tunnel? Give a sketch showing same with inlet tower.

10. What is the object of covering in clear water or filtered water storage tanks or reservoirs?

11. What is the difference between an inferential and an absolute measure water meter, and give a short description of a good type of each?

12. In arranging the reticulation pipes for a water supply, how would you proceed? Describe the function and working of a reflux valve, air valve. What is the maximum velocity desirable in water mains?

13. If it is absolutely necessary to rise above the hydraulic grade in a line of pipes, to what height above would you deem it safe to rise, and what special provision must then be made?

14. What is the meaning of "duty" and of efficiency in a pumping plant? What is fair duty to reckon on in ordinary good type of pumps? What is "slip," and how can it be minimised or avoided?

15. Describe shortly the difference between a bucket, a plunger, and a bucket and plunger, a piston and a centrifugal pump. What is a rotary type as compared with a direct-acting pump? What is the object and action of the high-duty attachment in a Worthington pump of the internal plunger type?

16. What is the law governing the bursting of pipes under internal pressure, and how does the strength of a pipe vary in terms of pressure, of thickness of metal, and of diameter?

17. In a sewerage system what is the meaning of "the combined," "partially separate," and separate systems? Give your ideas of the advantages or disadvantage of each.

18. Give a sketch of a manhole and lamphole, also gully, stating purpose and best form of each. Show how a branch sewer can be connected to one at much lower level.

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19. Describe shortly the difference between "chemical treatment," broad irrigation, and intermittent filtration in sewerage treatment, and how are the methods sometimes combined?

20. Describe shortly the principles of the International process for water and for sewage purification.

21. A district has to be provided with storm-water sewers; the area to be provided is 600 acres, which can be divided into three zones—low level, 300 acres; mid level, 200 acres; high level, 100 acres. The available grades are—1 in 500, 1 in 250, and 1 in 100 respectively. The rainfall to be provided for is $\frac{1}{2}$ inch per hour running off in the time it falls. Calculate diameter of circular drain in each case. Formula to be used:—

$$D = 1.5\text{th root of } \frac{Q^2 L}{1542 H}$$

Where Q = cubic feet per second.

L = length of sewer.

H = height = 1 foot.

D = diameter in feet.

Give cross-section of drain to be made in concrete in bad ground.

22. Describe shortly the principles on which garbage destructors should be constructed, giving general details of the best types.

23. What is the object of flushing drains and sewers, and describe the circumstances under which flushing is necessary and how it is accomplished; giving particulars of the main types of apparatus employed, including some of the leading types of automatic flushing tanks.

24. Describe shortly the principles on which the pneumatic systems work—for example, the Lieurner and Shone system. In what cases (if any) are these systems suitable?

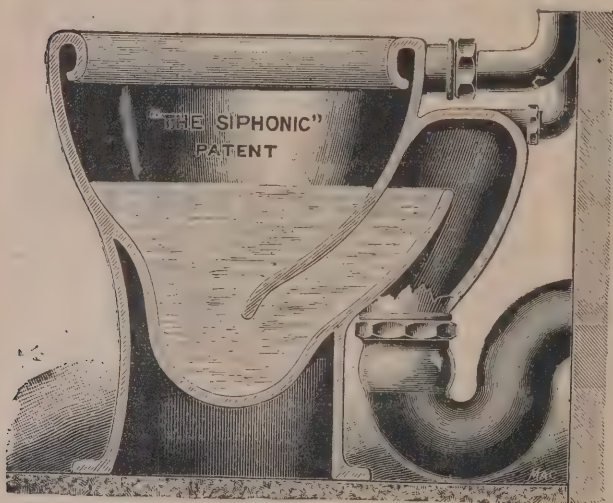
THE NORTH SEA AND BALTIC CANAL.

It is anticipated that in June the new ship canal between the North Sea and the Baltic will be opened. A waterway of the kind has been often proposed, but it is only eight years since the works were commenced. The canal will cost about 7,800,000*l.*, Prussia contributing a third of the amount.

A full description of the new waterway will be found, says the *Times*, in Herr C. Beske's book, "Der Nord-Ost-See Kanal," but we have space here for only some of the leading points. The canal is a little over 61 miles in length and is

throughout on the same level as the Baltic, where tides are unknown. Hence only two sets of locks have been necessary, one at each end, and even of these two the Holtenau locks may be treated almost as non-existent, as their gates will have to be closed only on the occasion of storms on the Baltic affecting the height of the waters there—say on twenty or twenty-five days in the year. Thus for vessels proceeding westward there will be an absolutely clear and unobstructed course as far as Brunsbüttel, and here, except for three hours each day at ebb tide, the lock-gates will have to be kept closed on account of the tidal changes in the Elbe, though vessels will be able to pass through at any time, subject to the ordinary delays. The breadth of the canal at the water level is 197 feet and at the bottom 72 feet $1\frac{1}{2}$ inches, thus allowing of a man-of-war and any ordinary merchantman passing one another wherever they may happen to meet, while at six different points along the line of route there are "bays," where the increase of superficial breadth from bank to bank to 328 feet and of the bottom breadth to 197 feet for a distance of 820 feet will allow of the passing of two men-of-war without fear of collision. The depth of the canal is 29 feet 6 inches. The old Eider canal, which has been incorporated in the new one as far as Rendsburg, save for various windings, now happily avoided, had besides its six sets of locks a depth of only 10 feet and a breadth of a little over 100 feet. The superiority of the new canal, with its far greater dimensions, almost unobstructed course and its outlet into the Elbe at a point where the river has a depth of about 40 feet, is clearly manifest.

As regards the work of construction, the most interesting feature is perhaps to be found in the great terminal locks, and of these the locks at Brunsbüttel claim first consideration. They are protected from the current of the river by two moles, the heads of which are 1,247 feet apart, thus allowing a good space for entrance into the outer harbour, which has a breadth of 328 feet and a length of 1,312 feet. Here the vessels that may have to wait their turn before passing through the river will be accommodated. The locks themselves are double, the one set lying parallel with the other, divided by some massive masonry, under which are several tunnels for the hydraulic machinery to be used for opening or closing the gates and other purposes. The width of each lock is 82 feet, the depth 30 feet and the available length, when the gates are closed at each end, is 492 feet—dimensions adequate to allow of the passing through the locks at any state of the tide of the largest ironclads now



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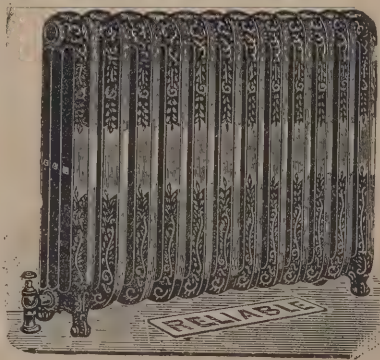
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possessed by Germany, while vessels the length of which exceeds that of the locks will still be able to pass through them during those hours of the day when the gates are all open. It is estimated, however, that four steamers or nine sailing ships of ordinary measurements can find room in each set of locks at one time, so that the period of detention ought not to be very great. As, too, the canal will be lighted with electricity along the whole of its length, vessels will be able to pass through by night as well as by day. On leaving the locks a ship coming from the Elbe will enter the inner harbour, which has a length of 1,640 feet and a breadth of 656 feet. Here the vessels from the Baltic will await their turn to enter the locks, and here, too, there will be a coaling station, accommodation for men-of-war, and a small harbour on the northern side for vessels used in connection with the working and maintenance of the canal. Outside the inner harbour the waterway tapers off to its normal dimensions.

The locks at Holtenau are similar to those at Brunsbüttel, though the outer and inner harbours vary in their dimensions, and the work generally has not presented so many difficulties as that done at the other end. It was carried on mainly in the dry, and the tidal fluctuations of a powerful stream like the Elbe had not to be provided against. Thus the cost of the Brunsbüttel harbour and locks is put down at 771,750*l.*, as against 660,000*l.* for those at Holtenau.

The bridges have formed another specially interesting feature of the work, from an engineering point of view. The canal is crossed by four lines of railway, and for two of these, the Neumünster-Heide line at Grünthal and the Kiel-Eckernförde line at Levensau, near to Kiel, fixed bridges have, with the help of embankments, been constructed at such a height above the level of the water that full-masted vessels can pass underneath without obstruction or delay and with only the lowering of the royal mast, the clear space between canal and bridge being 137 feet 9 $\frac{3}{4}$ inches. These two bridges have the widest span of any in Germany, the arch being 511 feet in length. The Levensau Bridge was formally opened by the Emperor on December 2, 1894. The two other railways, the Neumünster-Rendsburg line at Rendsburg, and the Itzehoe-Heide line, near to Brunsbüttel, are carried across the canal by means of swing bridges, the pivots of which are on the embankment of the canal, while each line has two separate bridges, carrying a single set of rails, so that in case of the one bridge becoming unworkable for a time the traffic could still be carried on by means of the other. There

is, too, at Rendsburg still a third swing bridge for the purposes of ordinary traffic. These bridges are said to be the largest of their kind yet constructed, their length being 328 feet, while they stretch across a clear breadth of 164 feet of water. Yet, notwithstanding their massive proportions, they can be turned completely round, by means of hydraulic power, so as to leave a clear course for high-masted vessels within so short a space of time as two minutes. The railway swing bridges will be in position only when trains are expected, remaining at other times parallel with the canal, though the bridge for pedestrians and vehicles will remain in position, being drawn aside only when necessary for the passing of vessels along the canal.

To the north of Rendsburg the railway crosses still another bridge at a point close to where locks have been provided for the purpose of maintaining communication between the North Sea Baltic Canal and the Eider river. Just to the east of Rendsburg there is a succession of small lakes, formed by the Upper Eider, and constituting part of the old Eider Canal. The new canal is diverted to the south-west at the Audorfer Lake, and passes to the south of Rendsburg, under the series of three bridges already spoken of; but the old waterway for the short distance from the lakes to the Lower Eider is to be maintained as well, in the interests of vessels proceeding to the river from this point, instead of continuing along the ship canal. In this way any interference whatever with the old Eider Canal traffic will be avoided, and vessels will be able to proceed along the river Eider to Tönning as before. But these arrangements rendered necessary a series of important works on the north side of Rendsburg. In the first place, the water level of the Upper Eider and hence of the lakes referred to had to be reduced to the same level as that of the ship canal, which was here to be incorporated with it, and the effect of this was to so far prejudice the interests of millers and others living in the neighbourhood that substantial compensation had to be paid to them. The reduction of the water level made still more necessary than before the deepening of the channel leading from the lakes to the Lower Eider, and this involved the building of a new railway bridge, which here also is a "swing" one, though in this instance the bridge rests on a central pivot built in the middle of the stream and not on one of the banks, the vessels passing on either side. New locks, much more commodious than those previously existing at Rendsburg, have also been provided to facilitate the passing from the different levels of river and canal, so that altogether the work carried out at Rendsburg has assumed a character of considerable importance.



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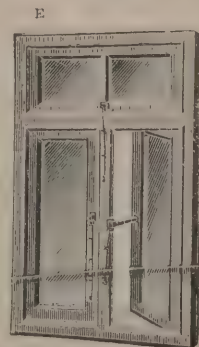


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A further interesting feature in the cutting of the canal was that connected with the Flemhuder Lake, a stretch of water some 578 acres in extent, and forming another of the series of lakes through which the Upper Eider passes before reaching Rendsburg. The level of this lake was 23 feet higher than that of the new canal, and to have so extensive a collection of water as this, and one, too, nearly 100 feet deep in parts, quite close to the new canal—into which the Eider, flowing from the lake, would still have to find an outlet—was, of course, altogether undesirable. Hence the water of the lake was made to run off into the canal until equality was established between the two, an opening then being cut in the canal banks wide enough to allow of a vessel passing direct from the canal to any part of the lake. The immediate result of this partial drainage of the lake was that large tracts of land were laid dry, though in order not to interfere unduly with the water supply of the locality a ring canal was made, by means of dams, around what were formerly the extreme limits of the lake, and hence on the same level. The Eider itself still flows into the Flemhuder Lake on the south side, but it now has a fall of 23 feet, and it is of some importance in the efficient working of the canal, as its waters will help to maintain a steady current from east to west, decreasing the possibility of the canal's being frozen over in winter, and increasing the volume of water which, flowing straight through the Brunsbüttel locks at ebb tide, is to help in keeping the North Sea entrance clear of obstruction.

The only other special feature of the engineering work which need be mentioned here was the trouble involved in cutting through some particularly marshy land around the Kuden Lake near to Brunsbüttel and the Meckels Lake, to the west of Rendsburg. Here light bridges were first built, little by little, in parallel lines across the bog, and along them were pushed small waggons containing sand, which was thrown down on the bog in such a way that the supports of the bridge were gradually covered by it. Then larger waggons of sand were sent along, and so in course of time a solid mass was obtained, the sand either pressing into the bog by its own weight or being worked in by the men employed. In this way a firm double dam was eventually formed capable of resisting both the pressure of the canal water on the one side and of possible inundations on the other. Then the intervening space between the parallel dams was dug out to the required depth, and a firm foundation for the canal, with its sides of stone and cement, eventually secured. With the exception of these stretches of

bog land the course of the canal mostly passes through sandy or clayey soil, and though no blasting operations were necessary, a good deal of the sand was of so loose a character that much trouble resulted at times from landslips, and special precautions were necessary for strengthening the sides of the canal in those parts where the soil is of this description. Steady perseverance, however, has enabled the contractors—working under the superintendence of the Imperial North Sea Baltic Commission—to overcome their difficulties, and the way in which the whole project has been carried through in accordance with the original programme, and, on the whole, within the original estimate of the cost, reflects the highest credit alike on those who mapped out the plan of operations and on those who have had the responsibility of carrying it into effect.

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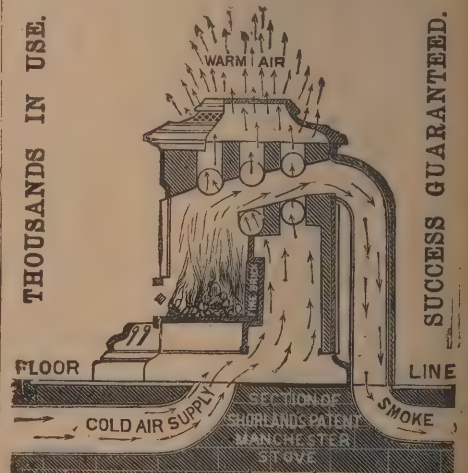
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THE VENTILATION OF BUILDINGS.*

IN presenting briefly a few suggestions and fundamental principles which it is believed may be found of service in arranging the ventilating system of public and private buildings, the sole effort has been to embody in as brief and lucid a form as possible the information which the writer has gathered during some years of study of the subject, and such facts as he has gleaned from his own experience in planning and superintending buildings of some size for hospitals and other purposes. The only recommendation offered for the plans and principles suggested is that they have borne the test of practical experiment in a satisfactory manner, which cannot be said respecting all the schemes for the warming and ventilation of buildings which have been offered in works on sanitary subjects published within the last score of years. In justice to himself the writer ought to say that he has not undertaken to make this paper exhaustive or anything more than what its title indicates; neither has he undertaken to enter the field which properly belongs to the architect, but rather to present simply such suggestions and theories as he has himself found of practical value and which are susceptible of general application, omitting altogether the minor details, which however necessary to the adaptation of a general plan or principles to any particular case, are likely to be of very little service except in the special conditions to which they are specially adapted. Seeking then to avoid as much as possible redundancy of language and circumlocution in methods of presentation, let us begin at once the discussion of the things most essential in a correct scheme for the proper ventilation and heating of a building.

First of all it may be stated that the ventilation and heating of a building must be considered together, for a successful working of each will depend upon the conditions of the other. It needs no argument to impress the fact that the amount of heat to be furnished in any given instance must depend very largely upon the amount of fresh air to be supplied per hour or minute. If the air of a room is to be changed four times per hour, certainly a proportionately larger quantity of fuel must be consumed than if the air is to be changed but once an hour.

The air-supply of a room or building is generally determined

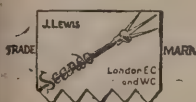
by its size rather than by the number of persons by whom it is to be occupied. This is certainly not a scientific method. A large room, occupied by but one or two persons, might possibly admit through cracks about windows and doors and through its porous walls a sufficient air-supply; while a small room, crowded with people, would require a very large provision for the supply of fresh air. The first thing, then, to be considered in the study of the ventilation of a room or building is the number of persons who are to occupy the space under consideration.

According to the most eminent sanitary authorities of England, each healthy adult person requires not less than 3,000 cubic feet of air per hour. This statement is based upon careful experiments, which showed that if the normal quantity of carbon di-oxide contained in the atmosphere—which is two parts to every 5,000 parts of air—is increased to three parts in 5,000 of air, the limit of tolerable impurity is reached; that is, if the amount of CO_2 is increased by respiration to a larger proportion than that stated, namely, three parts in 5,000, the air thus contaminated becomes productive of disease. It must not be supposed that the poisonous properties of such air are due to the chemical compound CO_2 . Air may contain a much larger proportion of CO_2 , provided this compound is derived from purely chemical sources, without injury being apparent. But when the CO_2 is furnished by the respiration of animals, there is associated with it a subtle poison which has been shown by the eminent physiologist, Professor Brown-Séquard, to be one of the most powerful poisons known, exceedingly minute quantities being sufficient to produce death.

A little computation based upon the experiments referred to will show that Dr. Parkes's figures are certainly not extravagant. With each breath each human being exhales into the air 1 cubic inch of carbon di-oxide and a definite amount of organic poison associated with it. As air naturally contains 2 cubic inches of carbon di-oxide in every 5,000 cubic inches of air, and as an additional cubic inch of CO_2 , or 3 cubic inches in 5,000 cubic inches of air is the limit of safety, it is evident that each breath renders unfit for further use 5,000 cubic inches, or approximately 3 cubic feet of air. The average person breathes eighteen times per minute; consequently each person spoils or renders unfit for further use 3 feet by 18 feet, or 54 cubic feet of air per minute. Fifty-four by 60 feet gives us, as the amount of air which each person contaminates per hour, 3,240 cubic feet, a slight excess over the amount named by Professor Parkes. Some other

* A report to the State Board of Health, by John H. Kellogg, M.D., member of the Michigan State Board of Health, Battle Creek.

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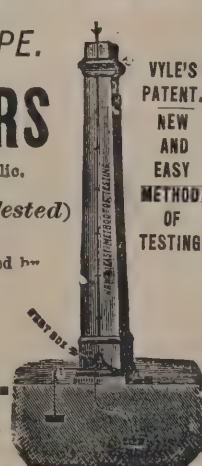
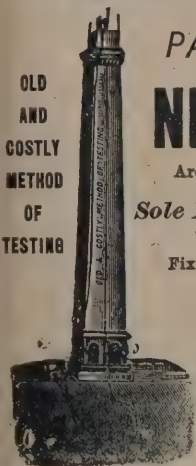
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authorities place the line of dangerous contamination at a somewhat higher point, and consequently they require a smaller amount of air. Avoiding either extreme, we may place the amount of air required per hour for each healthy person at about 2,400 cubic feet. It must be understood, however, that this rule applies to healthy persons only, and is not applicable to hospitals or buildings occupied by infirm or sick persons. For such institutions, and for manufacturing establishments in which the air may be contaminated by chemical or other processes, at least double the amount named, or 5,000 cubic feet of air per hour, must be supplied. In any given case, then, to ascertain the amount of air required per hour, we have only to multiply 2,400 or 5,000, as the case may be, by the number of persons to be supplied with air. The number of persons taken should be the maximum rather than the minimum number which the room or building is calculated to accommodate, for the evident reason that the capacity of a ventilating shaft, duct or opening may be easily diminished but cannot be so readily increased.

Having determined the amount of air required in any given case, the following important practical points remain to be determined:—

1. The circulation of the fresh air.
2. The area of fresh-air inlets.
3. The area of foul-air outlets.
4. The location of foul-air outlets.
5. The construction and location of foul-air ducts.
6. The location, sectional area and height of ventilating shafts.
7. The question of artificially assisting the draught by means of a pressure or suction fan, or by means of heat in the ventilating shaft.

We will consider each of these several questions in the order named.

1. A room cannot be properly ventilated without an efficient arrangement for the circulation of air. For this there must be for each space to be ventilated at least two openings: one for the admission of fresh air, the other for the removal of impure air. Nothing could be more absurd than the frequently witnessed attempt to ventilate a room by supplying it with a ventilating shaft connected with proper ducts and foul-air openings, but without any provision for a supply of fresh air. Such an arrangement is eminently well calculated to produce dangerous draughts through the opening of windows, and the impression that any attempt at efficient ventilation is liable to result in

failure. It is also essential for the proper distribution of the air admitted to a room that the air shall be heated before it enters the room or building, or at the moment of entering.

2. To determine the required area of fresh-air inlets, the amount of air required and the velocity at which the air is to travel must be known. Air heated to a temperature of 40 deg. Fahr. above that of the external air will travel at the rate of about 5 feet a second when entering a room of ordinary height from which it may escape readily. If the escape of air from the room is assisted by means of an efficient ventilating shaft the velocity of the incoming air may be safely computed as 10 feet per second. If the fresh air enters the room at a temperature so high as 120 deg. Fahr. to 150 deg. Fahr., the velocity of the air-current will be increased to 12 or 15 feet per second. Better practical results are obtained by large volumes of moderately heated air travelling at a moderate speed than from superheated air travelling at a high velocity.

Calculating the velocity of the incoming air at 10 feet per second, it is only necessary to divide the total amount of air required per second by ten, and the result will represent the area of free opening required. An allowance of at least 40 per cent. must be made when the openings are covered by register-plates. For example, suppose the amount of air needed is 240,000 cubic feet per hour, sufficient to supply 100 persons with the minimum quantity of air. This requires 66⅔ cubic feet of air per second. Sixty-six and two-thirds divided by 10 is 6.6⅔. Adding 40 per cent. for obstruction of register-plate gives us 9.3 square feet as the combined areas of the register-covered openings for admitting fresh air.

3. The number and location of the fresh-air inlets is not a matter of so great importance as is commonly supposed. If the fresh air enters the room at a temperature 20 deg. to 40 deg. higher than that of the air of the room it will go at once to the ceiling, no matter where or how admitted, and will thence gradually diffuse itself through the room, its course being chiefly determined by the location of the windows and of the foul air exit openings. I think it preferable that the fresh-air inlet should be in the wall near the floor, rather than in the floor, as it is by this means better protected against the accumulation of dust and dirt.

In the case of large buildings containing several floors and many rooms or apartments to be supplied with air it is best not to undertake to carry a separate fresh-air duct to each room, but to equalise the air-pressure within the building by leading large ducts to the common hall or corridor of



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4. Experience has shown that in order to prevent unpleasant draught, the velocity of the air at outlet openings should not be greater than 5 feet per second. The necessary area of outlet openings is readily obtained, then, by simply dividing the total amount of air to be supplied per second by 5. For example, suppose a room to be ventilated is calculated to accommodate thirty persons, each to be supplied with 2,400 cubic feet of air per hour. The aggregate amount of air to be supplied will be 30 feet by 2,400 feet, or 72,000 cubic feet. Dividing this amount by 3,600, the number of seconds in an hour, we have 20 cubic feet as the amount required for each second. Dividing this by 5, the velocity allowable, we have 4, which represents the necessary area for the foul-air outlets in square feet.

It must, of course, be understood that the figures thus obtained represent actual opening, and not an opening partially obstructed by a grate or register. As before stated, 40 per cent. more must be allowed when the opening is covered by an ordinary register.

As regards the proportion of the area of the foul-air exits to the area of fresh-air inlets, it may be said that outlets should be at least double the area of the inlets, since a velocity of 10 feet or 15 feet per second may be allowed without injury or inconvenience at the inlet, although such a velocity would not be tolerable at outlet openings.

5. When a room is heated wholly or chiefly by warm air the distribution of heat in the room will be almost wholly controlled by the location of the foul-air outlets. The natural course of the air-current is this: the heated air rises to the ceiling, spreads out, and coming in contact with the outer walls, which are lower in temperature than the inside walls, especially the windows, it is cooled and falls to the floor. It is evident then that as the outer walls and the portions of the room adjacent to them are necessarily the coldest part of the room, the circulation of the air through the room and the proper distribution of the heat will be facilitated by placing the foul-air

openings along the outer walls and preferably under the windows. If the foul-air outlets are placed in an inner wall or at the floor near an inside wall one effect will be to draw toward this opening warm air which ought to have been utilised in warming the outer walls. Another effect, and one of the most disagreeable features attending this method of placing the foul-air outlets, is that the air which has been cooled by contact with the windows and outer walls and by its greater specific gravity has fallen to the floor, will be drawn the whole distance across the floor to the opening on the opposite side, thus constantly maintaining at the floor a stratum of cold air. An arrangement of this sort is a very frequent cause of cold floors, and consequently cold feet, and the resulting headaches from which the occupants of such a room are almost sure to suffer.

The foul-air outlets should be placed as near the floor as possible. The opening may be in the base-board or in the floor itself. The only objection to the latter method is the collection of dust which is likely to be swept into the opening.

6. The ventilating ducts communicating with the foul-air outlets should have a sectional area equal to the free area of the openings with which they communicate. This capacity should be maintained until the duct reaches the ventilating shaft, and should be increased if several turns are made in the duct, as each square turn has the effect to diminish the velocity of the air current nearly one-half. Square turns should never be made, and the ducts should be enlarged at the angles where a turn is necessary. In case a duct must be carried for some distance, its capacity should be increased 50 per cent. or even 100 per cent. to compensate for the great amount of friction occasioned by distance. The ventilating ducts should of course be made tight. For this purpose it is necessary that they should be lined with metal or some other durable material. Even well-seasoned lumber will shrink and open up large cracks, by which the efficiency of the duct will be very materially diminished. It is also a wise plan to construct ventilating ducts of some non-combustible material, or at least to line with such material as a caution against fire.

Only ducts coming from the same room or floor should be connected with the common ventilating shaft. Each storey must have its own foul-air shaft, otherwise the counter draughts occasioned by the opening of doors and windows, especially in moderate weather, or the adverse influence of winds, will be certain to lead to contamination of the air of one room by the

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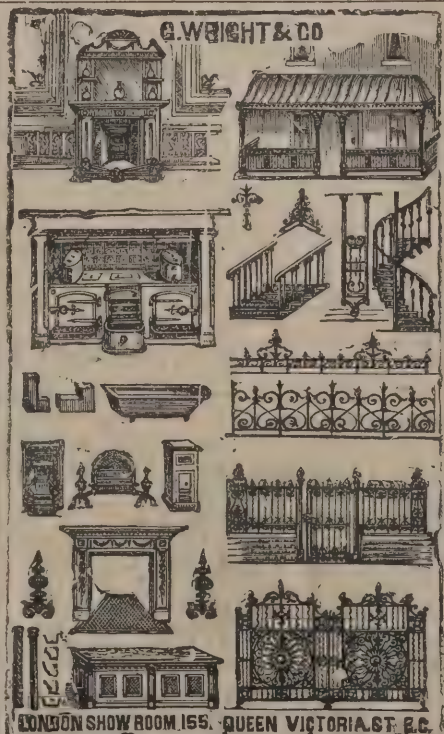
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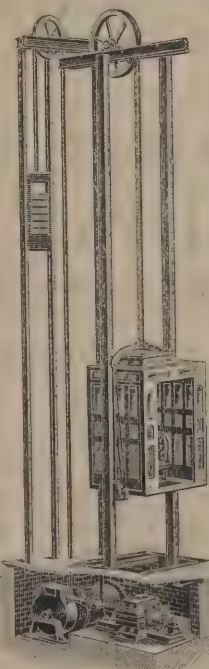
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air of another room with which it is in communication through the common shaft.

It is of the utmost importance to supply each floor, and, if possible, each room, with its own independent ventilating shaft, running as directly as possible to the open air without any connection with other ducts.

7. The location, sectional area and height of the ventilating shaft are questions of very great interest and practical importance. As regards location, it is always better that the ventilating shaft should, when possible, be located within the building, as in an inside wall. This insures a temperature equal to that within the building, and so secures a constant and positive draught whenever the building is supplied with artificial heat. If, in addition, the ventilating shaft can be located adjacent to the chimney, or if the smoke can be carried up through it by means of a boiler-iron stack or a stack constructed of sewer-pipe, a still higher temperature of the air in the ventilating shaft and hence a better draught will be secured.

The sectional area of the shaft will depend upon the amount of air to be removed and the height of the shaft.

By a careful study of the tables of Parkes and others I have been able to construct a simple formula which is of great practical service in determining these two questions. The following is the formula:—The square root of the height of a shaft, multiplied by the square root of the difference in temperature between the air in the shaft and the outside air, divided by 4, equals the velocity of the air in the shaft in feet per second. In using this formula it is of course necessary that two of the quantities should be known. The difference in temperature is a pretty constant factor. In fixing this, the minimum difference should of course be chosen rather than the maximum, as a ventilating shaft which may have an ample capacity in extreme cold weather, when the great difference between the external and internal air would secure a powerful draught, would be quite insufficient to supply the necessary amount of air in moderate weather. I have chosen as a basis for obtaining the minimum difference in temperature the temperature of 45 deg. Fahr. for external and 70 deg. Fahr., the usual internal temperature. At a temperature much higher than 45 deg. doors and windows are likely to be opened, and hence the working of any ventilating apparatus would be interfered with. The difference between 45 deg. and 70 deg. is 25 deg., which may be fairly taken as a basis for calculation.

(To be concluded.)

THE STATE OF THE MERSEY.

THE acting conservator of the Mersey, Admiral Sir G. H. Richards, K.C.B., has just submitted his annual report on the navigation of the river to the Conservancy Commissioners, and therein he states that there are few and very unimportant changes in the features of the shoals and principal channels to record for 1894. This is, of course, excepting the dredging of the bar of the Queen's Channel. Of the minor changes the only ones worthy of note are a reduction in the area of the shoal patch eastward of the lightship—the depth on it at the least water is now 17 feet instead of 15 feet and 18 feet as formerly—and the continued operations of the silting process in the Rock Channel, not so much, however, at the entrance of the Bight of Hoyle as to the eastward of a line drawn north from the Leasowe Lighthouse, thence onward to the Rock Gate the depths continue to decrease. Vessels drawing 15 feet cannot now remain at anchor for a low tide to the eastward of R.I. Red Conical Buoy. The channel, however, says the conservator, has its value for navigation at tide time, and the coasting steamers which use it relieve the Queen's Channel traffic.

Dealing with the dredging operations at the Bar, the first three months of 1894 were, states Admiral Richards, unfavourable for dredging, nearly one-half of the time being lost. During the latter end of the year also the weather interfered considerably with the operations. The *Brancker* and two smaller dredgers removed during the first half of the year 2,831,740 tons of sand, of which quantity the *Brancker* accounted for 2,374,350, and during the second half the *Brancker* removed 1,451,050 tons from the Bar and 625,250 tons from Taylor Spit, the smaller dredgers removing 640,000 tons. This makes the total quantity of sand removed since the commencement of the work in September, 1890, to December, 1894, 8,935,980 tons, of which the *Brancker* has removed 5,050,650 tons. The results obtained are considered very satisfactory. At the end of June, 1894, the least depth of water in the 1,000 feet cut at low water of a spring tide falling 10 feet below Old Dock Sill was 20 feet, while in December the least depth at the same datum, and for a width of 1,250 feet was 22 feet, and for a space of 500 feet outside the buoys which mark the channel the depth was not less than 19 feet on the north side and 16 feet on the south side. The whole space of the cutting for a width of 1,400 feet had an average depth of more than 23½ feet at low water spring tides, though for navigable purposes it could only be taken at

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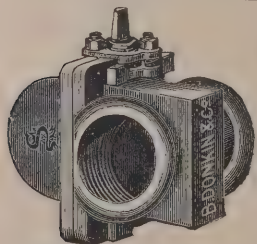
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read top Advertisement on page xiii.

the minimum depth. The bottom was uneven owing to the nature of the dredging, but the heavy gales of last year have had no injurious effect, their tendency, on the contrary, having been to level the floor of the cutting. It may be generally stated that vessels drawing 23 feet of water can enter the Mersey at low water tide; at one hour flood a minimum of 25 feet 6 inches; at two hours 30 feet 8 inches, and at three hours 35 feet 8 inches will be found during the lunitation.

The question of the deposit of excavations, dredgings, &c., states the conservator, becomes year by year more difficult, owing to the increased quantities to be dealt with coming from the Ship Canal and other sources. The Conservancy at the present time is almost wholly dependent for the proper disposal of dredged material on the co-operation of the several public bodies who control the different works from which it is collected. The staff of the marine surveyor, however, are always on the alert to ascertain the results of these deposits which are less likely to be injurious, at any rate in the navigable channel, since the dredging operations at the Bar have been in force and a system of monthly returns of the deposit of dredging has been established. The rock, clay, town refuse, &c., from all sources deposited during the year 1894 amounted to about 409,308 tons, and silt 2,293,545 tons.

With regard to the Manchester Ship Canal questions still exist, says the report, which may affect the integrity of the navigation of the Mersey. The most serious of these is that the tidal portion of the river at Warrington and for some miles below it has silted up, occasioning a considerable loss of depth, which has been partially caused by the diversion of the upper waters from their normal course. This has decreased the sectional area and tidal capacity of the river, and those navigating in that vicinity assert that since the canal was opened the tide does not rise so high as it used to do, and there can, in Admiral Richards's opinion, be little doubt of the correctness of these statements. The canal company are now undertaking work in the hope of remedying this serious condition of things.

The abstract of traffic through the several sea-channels recorded by the lightships, for both the inward and outward traffic, is 42,928 vessels, of which 37,559 used the Queen's Channel, and passed the Crosby lightship and Askew Spit, showing an average of 103 vessels daily using this channel in entering and leaving the port of Liverpool. The number of vessels using the Rock Channel was 4,980, and 389 passed through the Formby Channel. The full average of daily traffic

in and out of the port of Liverpool was 118 vessels. There were 1,489 vessels more than the total of 41,439 recorded as the traffic of the previous year. The Customs tonnage returns for the year 1894 are:—Inward 8,585,325 tons, outward 9,129,558 tons, being an increase, as compared with 1893, of 883,181 tons.

The lifeboats have been required on eleven occasions by vessels in distress, and 13 lives were saved. The water bailiff's return for 1894 shows 80 wrecks and casualties, an increase of 17 over the previous year.

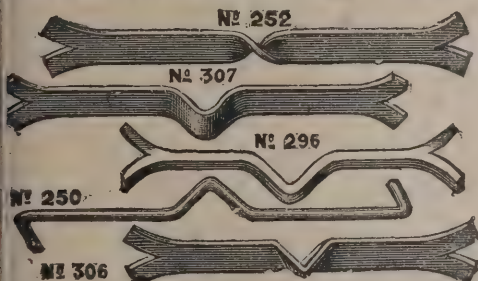
A NEW ITALIAN LAKE.

To go to bed in a plain and to get up on the banks of a lake, to lie down an agricultural labourer and to wake a fisherman, is not a common experience, says the Florentine correspondent of the *Scotsman*, even in those days of telluric storm and seismic convulsion. Such, however, is precisely what has just happened, and not many miles from Rome. Alighting at the station of Monte Rotondo, famous for a Garibaldian victory, which preceded by a few days the Garibaldian defeat at Mentana on November 2, 1867, you proceed to Leprignano, not far from Castelnovo di Porto. This is a hamlet numbering about a thousand souls, chiefly agricultural in their calling. It stands some 600 feet above the sea level, on a plateau to the right of the Tiber, near the valley watered by the Gramicia torrent. Few visitors but those interested in Etruscan antiquities are ever seen at Leprignano, quite unattractive as it is, except for the ruins of Capena, that ancient Etruscan city whose importance may even now be gauged by the number and quality of its tombs. On the morning of the 8th inst., however, the little hamlet was conscious of a profound rumbling, the preliminary to further sounds of similar import, announcing the noise it is now making in the world. On the 12th and 13th the rumbling was repeated, and on the latter date it was found that the soil occupying a space of six hectares had collapsed, and that the vacuum had been filled with water, forming a quite respectable lake. Sulphurous gases bubbled up to the surface, disclosing the springs from which the lake is fed, while from its raw margin emanated similar exhalations, finding their vent through the numerous cracks that run their eccentric course around it. All the countryside turned out to witness the improvised sheet of water, and some young peasants, more adventurous than their fellows, advanced

John Heath's Pens.

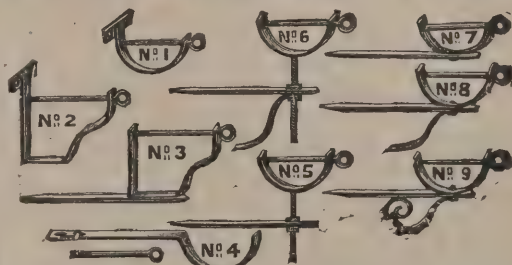
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No. 84,208

towards the brink, only to feel the earth giving way beneath them and to get a good ducking. The extreme unsteadiness of the surrounding soil, indeed, favours the view that the lake will gradually widen in circumference, for already there have been landslips at various points of its margin, followed immediately by a rise of the water.

The phenomenon, as may well be imagined, is attracting much interest in the scientific world, and this morning, at the instance of the Prefect of Rome, a deputation consisting of Professors Meli and Keller, who hold the chairs of geology and physics in the University, started by the 10 A.M. train for Monte Rotondo and Lepignano. Reinforced by a civil engineer delegated by the Minister of the Interior, they will examine the phenomenon in all its bearings, and an interesting report of their findings may shortly be expected. Meanwhile it is satisfactory to note that nature is, so to speak, entering her protest against the mania of modern Italy for draining her inland sheets of water and destroying the amenity while not aiding the salubrity of the country. There was, perhaps, good ground for draining the Lago di Fucino, as from its site and its sudden risings disasters were from the oldest historical times associated with its presence. But to make this a precedent for the draining of Lake Thrasymene is what enlightened Italy, I am glad to think will not tolerate. The Lake Regillus has long ago disappeared from "under the Porcian height," and the gain to agriculture or to the reduction of malaria has not been so conspicuous as to compensate the loss of an old historic landmark. Rather should engineering energy be devoted to regulating the river courses throughout the peninsula—equalising their water-supply, so as to make them less like gravel pits in summer and more like fertilising streams in the autumn and spring. But this leads us on to the protection of the woods and forests, the reckless cutting down of which is the main cause of Italy's disastrous floods, now numbered by her as among her worst annual visitations. But this theme is of too great magnitude for the close of a letter, which must end as it began with a note of congratulation on the addition of a new lake to a region all too deficient in water-supply, and in the amenity and salubrity which such a natural resource almost invariably brings.

THE death is announced of Mr. Lee Hankey, at his residence near Malpas. Mr. Hankey was a partner in the firm of W. & F. Brown & Co., builders, Chester.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

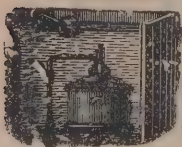
- 7135. Holdsworth Akeroyd, for "Improvements in or appertaining to water-closets."
- 7138. John Shaw, for "Improved automatic down-cast and up-cast cowl for sewers, drains and other structures."
- 7155. William Edwards, for "A new or improved window fastener."
- 7173. John Frederick Spencer, for "Improvements in the constructional arrangements of buildings."
- 7218. Theodor Baldwin Wilcox and Henry Wilcox, for "Improvements in window fasteners."
- 7257. Thomas Walter Tucker, for "Improvements in draught excluders for doors."
- 7261. August Kiemchen, for "Improvements in roofing tiles."
- 7277. Stanley Smith, for "Improvements in or relating to drainage flooring or paving."
- 7382. William Murchland, for "Improvements in and connected with water-closets."
- 7487. James Laidlaw Wood, for "Improvements in sash fasteners."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & CO., Patent Agents, 37 Chancery Lane, London, W.C.

IN order to minimise the danger of fire, the authorities of the South Kensington Museum have decided to substitute concrete and mosaics for wood as materials for the floors throughout the east and west galleries, where the science collections and the valuable Indian section, including the silks and other fabrics, are situated. The work has already been commenced.

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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1873.

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SPECIAL NOTICE TO THE TRADE AND OTHERS.

[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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* * As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

COMPETITIONS OPEN.

LLANELLY.—May 15.—Elevations and Plans are invited for proposed School. Mr. Fred. Nelson Powell, Clerk to the Managers of the Llanelly Intermediate and Technical Schools, Llanelly.

CONTRACTS OPEN.

ABERSYCHAN.—May 11.—For Iron Girders, Masonry, &c., for Widening Bridge. Mr. E. Cooke, Council Offices, Abersychan.

ACTON.—May 7.—For Construction of Sewer in Mill Hill Grove and Avenue Road. Mr. D. J. Ebbetts, 242 High Street, Acton.

ANDOVER.—May 10.—For Erecting Iron Fence, with Dwarf Wall. Mr. T. E. Longman, Town Clerk, Andover.

BARROW-IN-FURNESS.—May 15.—For Supplying and Erecting Gasholder Lift. Manager, Gasworks, Barrow-in-Furness.

BARROWFORD.—May 20.—For Sewerage Works. Mr. J. T. Landless, Station Buildings, Nelson.

BASSENTHWAITE.—May 11.—For Building Dwelling-house. Mr. F. Waite, High Side, Bassenthwaite.

BECCLES.—May 11.—For Building Shops, &c. Secretary, Working Men's Co-operative Society, Limited, Newgate Street, Beccles.

BEXHILL-ON-SEA.—May 9.—For Supply of 1,000 Cubic Yards of Stone or Granite for the Repair of Roads. Mr. M. Hodgson Graves, Town Surveyor, Bexhill.

BLANDFORD.—May 9.—For Laying-on Water Service to Workhouse. Mr. Charles Hunt, Elmfield Cottage, The Close, Blandford, Dorset.

BOSHAM.—May 10.—For Building School, Offices, Master's House, &c. Mr. N. C. H. Nisbett, 62 High Street, Winchester.

BRIGHTON.—May 10.—For the Construction of Two Concrete Groynes and a Sea-wall. Mr. Francis J. C. May, M.I.C.E., Town Hall, Brighton.

BRISTOL.—For Alterations and Additions to Chapel. Mr. H. J. Jones, 12 Bridge Street, Bristol.

BURY.—May 18.—For Forming Roads. Borough Engineer, Bank Street, Bury, Lancs.

CANTERBURY.—May 23.—For Supplying Road Materials. Mr. A. H. Campbell, 28 St. Margaret Street, Canterbury.

CAVERSHAM.—May 3.—For Construction of Sewerage Works. Mr. Nicholson Lailey, Engineer, 16 Great George Street, Westminster, S.W.

CITY OF LONDON.—May 7.—For Performance of Carpenters' Work for a Period of Three Years. Mr. H. Montague Bates, Guildhall.

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COLNE.—May 9.—For Constructing Concrete Tanks and Engine-house, &c. Mr. H. Holgate, Lloyd's Chambers, Colne, Lancs.

CONSETT.—For Building Lecture-hall and School. Messrs. Armstrong & Knowles, 38 Grainger Street West, Newcastle.

CONVICT PRISONS.—May 4.—For Supply of Timber, Deals, Bricks, Lime, Cement, Sand, Slab and Roofing-slates, &c., for New Buildings for the Period ending March 31, 1898, to Dartmoor, Parkhurst and Portland Convict Prisons. Directors of Convict Prisons, Home Office, Whitehall.

CORTON.—May 13.—For Building Church Schools. Messrs. Bottle & Olley, 5 Queen Street, Great Yarmouth.

CULLOMPTON.—May 16.—For Rebuilding Bridge with Iron Girders. Mr. H. Michelmores, County Council Offices, Exeter.

DRIGHLINGTON.—May 9.—For Alterations and Extension to Chapel. Mr. T. A. Buttery, Architect, Queen Street, Morley.

DULWICH.—May 7.—For Formation of New Road. Mr. Charles Barry, 1 Victoria Street, S.W.

EASINGWOLD.—May 17.—For Drainage Work at the Workhouse. Mr. F. J. H. Robinson, Guardians' Offices, Easingwold.

FRAMLINGHAM.—May 15.—For Laying Stoneware and Iron Pipe Sewers. Mr. T. Miller, 9 Thoroughfare, Ipswich.

FULHAM.—May 14.—For Erection of a Branch Post Office. Mr. A. Paull, 6 Quality Court, Chancery Lane, E.C.

GLOUCESTER.—May 21.—For Constructing Reservoir and Laying Cast-iron Pipes. Mr. Wm. Fox, 5 Victoria Street, Westminster.

GRAVESEND.—May 14.—For Erection of Municipal Offices. Mr. A. G. Smith, M.S.A., 1 Darnley Street, Gravesend.

GREAT BENTLEY.—May 23.—For Building Schools, Master's House, &c. Mr. J. W. Start, Architect, Colchester.

GRIFFITHSTOWN.—May 10.—For Building Infirmary. Mr. E. A. Lansdowne, Metropolitan Bank Chambers, Newport, Mon.

HARLYN BAY.—May 9.—For Building Bridge. Messrs. Jenkin & Son, Civil Engineers, Liskeard.

HAVANT.—May 11.—For Building Board School. Mr. A. E. Stallard, Architect, West Street, Havant.

HALIFAX.—May 11.—For Constructing Reservoir and Laying Earthenware and Cast-iron Pipes. Messrs. Horsfall & Williams, 15 George Street, Halifax.

HEMSWORTH.—May 9.—For Laying Iron Pipes. Mr. Richardson, Surveyor, Hemsworth.

HERTFORD.—May 9.—For Supplying and Laying Cast-iron Water Mains. Mr. T. R. Dickinson, Borough Surveyor, Hertford.

HUNSLET.—For Building Ten Almshouses, Fence Walls, &c. Mr. John E. Leak, Architect, Hunslet, Leeds.

KENDAL.—May 7.—For Excavating, Quarrying, Embanking, Pipe-laying and Other Work, and for Providing certain Plant and Delivering certain Stone, Concrete, Cast-iron Pipes, Stoneware Pipes and Other Materials required in Connection with the Formation of a Reservoir at Fisher Tarn, near Kendal, and with the Works for Conveying Water to and from such Reservoir. Mr. Christopher Graham, Highgate, Kendal.

KENSINGTON.—May 16.—For Enlarging Nurses' Home. Mr. T. W. Aldwinckle, 1 Victoria Street, Westminster.

KNOCKHOLT.—May 15.—For Building Police Station. Mr. F. W. Ruck, 86 Week Street, Maidstone.

LEWISHAM.—May 6.—For Pulling-down Hither Green Lodge and Other Premises. Mr. Edwin T. Hall, 57 Moor-gate Street.

LEYBURN.—May 16.—For Building Church Room. Mr. Wm. Bell, N.E.R. Station, Leyburn.

LISCARD.—May 27.—For Excavating and Forming a Lake in Central Park. Mr. A. Salmon, Public Offices, Egremont, Cheshire.

LONDON.—May 6.—For Repairs, Painting, &c., at the Central London Sick Asylum Office, Cleveland Street, W. Mr. W. S. Cross, F.R.I.B.A., Outer Temple, W.C.

MANCHESTER.—For Building Thirteen Storage Warehouses on the Ship Canal Dock. Mr. C. Heathcote, 6 Princess Street, Manchester.

MANCHESTER.—May 8.—For Fixing Sanitary Fittings at Town Hall. Mr. T. de Courcy Meade, Town Hall, Manchester.

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MANCHESTER.—May 16.—For Pointing Chimney-stacks and Walls at Workhouse. Messrs. W. T. Gunson & Son, 10 Marsden Street, Manchester.

MIDLAND RAILWAY.—May 3.—For Cleaning and Painting of Station Buildings, &c., at Leicester, Midland Goods Depot; Liverpool, London and Canada Dock Goods Depot and Houlgrave Street Stable; Withington, Didsbury and Heaton Mersey Stations, and Locomotive Buildings at Belle Vue (Manchester). Mr. James Williams, Derby.

MILE END.—May 23.—For Erection of a New Steam Laundry and Cottage at the Infirmary, and for Certain Alterations and Additions to the Laundry and Boiler-house at the Workhouse. Mr. Chas. F. Burden, Guardians' Offices, Bancroft Road, E.

MIRFIELD.—May 8.—For Building Eight Houses. Mr. Arthur A. Stott, Architect, Heckmondwike.

MOSS SIDE.—May 18.—For Building Board School and Caretaker's House. Messrs. Woodhouse & Willoughby, 100 King Street, Manchester.

MURTON COLLIERY.—May 13.—For Building Twenty Cottages. Mr. Robert Hogg, Fatterr Pasture, Murton Colliery.

OTLEY.—For Building Eight Houses. Messrs. Fairbank & Wall, 3 Manor Square, Otley.

POPLAR.—May 8.—For Supplying Building Materials. Mr. G. Herbert Lough, Clerk to the Guardians, Upper North Street, Poplar.

RADCLIFFE.—May 15.—For Building School, &c. Mr. Edwin Grundy, 12 Brazenose Street, Manchester.

RAWDON.—May 13.—For Building Chemical Mixing-house and Concrete Precipitation Tanks and Laying Stoneware and Iron Pipe Sewers. Mr. W. H. Radford, Angel Row, Nottingham.

ROCHDALE.—May 10.—For Building Offices for the Guardians. Messrs. Rutworth & Duncan, Architects, South Parade, Rochdale.

ROTHERHITHE.—May 6.—For Erection of Infectious and Non-infectious Mortuaries, Post-mortem Room, &c. Mr. Norman Scorgie, Lower Road, Rotherhithe.

RYTON.—May 13.—For Constructing Sewers, with Flushing Chambers, Ventilation Shafts, &c. Mr. J. P. Dalton, Urban District Council Offices, Ryton-on-Tyne.

SCARFSKERRY.—May 15.—For Constructing Concrete Pier. Mr. James Barrow, 166 Union Street, Aberdeen.

SEVENOAKS.—May 4.—For Levelling, Metalling, Kerbing, Graveling, Channelling and Making Good of the Bradbourne Park Road and Laying of Stoneware Pipe Sewers, with Manholes, Lampholes, Gullies and other Works connected therewith. Mr. Jabez Mann, C.E., Urban Council Offices, Argyle Road, Sevenoaks.

SHEFFIELD.—May 11.—For Building Dwelling-house. Mr. C. Hadfield, Old Club Chambers, Norfolk Street, Sheffield.

ST. MABYN.—May 11.—For Building Schools. Mr. John J. T. Andrew, St. Mabyn.

ST. HELIERS.—May 10.—For Constructing Landing Stage. States Engineer's Office, Jersey.

STOCKPORT.—May 13.—For Constructing Brick Sewers. Mr. A. M. Fowler, 1 St. Peter's Square, Manchester.

SUTTON.—May 6.—For Internal Cleansing, Distemping, Colouring, Painting, &c., of the Several Blocks of the Girls' School, Banstead Road, Sutton, Surrey. Mr. Dennett, South Metropolitan District School, Brighton Road, Sutton, Surrey.

THORNHILL.—May 10.—For Building Five Cottages. Mr. James C. Haller, Thornhill, Dewsbury.

TUNBRIDGE WELLS.—May 25.—For Erecting Dressing Boxes, &c., at the Open-air Baths. Mr. W. C. Cripps, Town Hall, Tunbridge Wells.

WADSLEY.—June 7.—For Building Kitchen and Outside Staircase at the Asylum. Mr. J. W. Cotterill, Wadsley Asylum, near Sheffield.

WALSALL.—May 14.—For Providing and Laying Asphalte. Mr. John R. Cooper, Town Clerk, Walsall.

WAR DEPARTMENT.—May 6.—For Limewhiting, Colouring, &c., and Internal and External Painting to the Various Buildings comprising Ramillies Barracks, and Works in connection therewith, at Marlborough Lines, in the North Aldershot District. Major W. F. N. Noel, R.E., Royal Engineer Office, North Aldershot.

WAR DEPARTMENT.—May 31.—For Engineer Station and Out-Station in the North-Western District, Liverpool. Major

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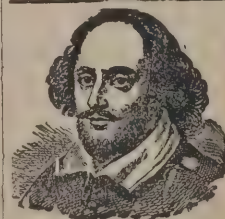
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WEST HAM.—May 14.—For Two Beam Pumping-Engines, each about 250 Indicated Horse-power; Two Centrifugal Pumps and Engines, each about 350 Indicated Horse-power; Four Boilers, each 30 Feet in Length by 7 Feet 6 Inches in Diameter; also Alterations to Existing Centrifugal Pump, Engine and Boilers and Other Works. Mr. Lewis Angell, Town Hall, Stratford.

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WESTMINSTER.—May 10.—For Rebuilding West Block of Workhouse. Messrs. J. Waldram & Son, 13 Buckingham Street, W.C.

WHITECHAPEL.—May.—For Internal Painting and Minor Structural Works at the Infirmary, Mile End Road. Mr. Capel, Union Offices, Baker's Row, E.

WILLESBOROUGH, KENT.—May 5.—For Deepening the Well at Workhouse. Mr. A. J. Burrows, F.S.I., 41 Bank Street, Ashford.

WILLESDEN.—May 7.—For Construction of 4,000 feet Pipe Sewers with Manholes and other Incidental Works. Mr. O. Claude Robson, Public Offices, Dyne Road, Kilburn.

WYE.—May 11.—For Constructing Gasholders and Tank. Mr. W. Lewin, the Gas Company, Wye.

YSTRAD RHONDDA.—May 11.—For Building Church and Boundary Walls. Mr. E. M. Bruce Vaughan, Architect Cardiff.

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A. H. Green, Blandford	3,750	0	0
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J. J. SMITH & Co., Croydon (accepted)	233	0	0

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Thornton & Crebbin, Bradford	166	6	4
Blakeborough & Sons, Brighouse	138	19	9
Clapham Bros, Keighley	131	16	1
Lees & Sons, Gomersal	131	9	6
Clay, Henriques & Co, Dewsbury	113	8	2
ROBERTS & CO, Limited, Union Foundry, Bradford (accepted)	109	13	5

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Surveyor's estimate	7,500	0	0

Plumbing Work.

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FARINGDON.

For Rebuilding a Cottage at Little Coxwell, near Faringdon, Berks, for Mr. W. R. Hole. Mr. WILLIAM DREW, M.S.A., Architect, 22 Victoria Street, Swindon.

C. WILLIAMS, New Swindon (accepted)	£166	17	0
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CROWBOROUGH.

For Building a New Public-house, the Rose and Crown, for Messrs. Ballard & Co. Mr. CURTIS CARD, F.S.I., Architect, Lewes.

W. Wells, Lewes	£1,167	0	0
Wickens & Son, Crowborough	1,162	0	0
D. WICKENS, Crowborough (accepted)	1,018	0	0
Packham, Uckfield (withdrawn)	800	0	0

FINEDON.

For Enlargement of National Schools, Finedon. Messrs. MOSLEY & ANDERSON, Architects and Surveyors, Good-year Chambers, Northampton.

G. Branson & Son, Northampton	£439	0	0
A. Ball & Son, Northampton	435	0	0
Tebbutt & Pratt, Wellingborough	401	0	0
T. Chapman, Finedon	395	0	0
Wilford & Judkin, Northampton	388	15	0
F. HENSON, Finedon (accepted)	387	10	0

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F. Morton, Liverpool	199	10	0
Smith & Co., Glasgow	198	5	0
Hollom, London	194	0	0
M. Pitts, Stanningley	192	7	0
MURDOCH & CAMERON, 115 Bothwell Street, Glasgow (accepted)	172	0	0

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For Enlargement of Girls and Infants' School and Erection of Outbuildings and other Work, for the Managing Committee of Halesworth National Schools. Mr. ARTHUR PELLE, Architect, Beccles.

Martin & Son, Bungay	£604	0	0
Brock & Sons, Aldeburgh	510	0	0
Cuttings & Sons, Saxmundham	488	0	0
F. Woodyard, Halesworth	365	0	0
S. HOWARD & SONS, Halesworth (accepted)	355	10	0
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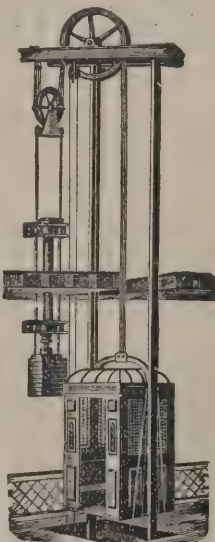
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Scott & Co., Kirkcaldy, joiner	3,034	0	0
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For Building Wesleyan Chapel and Classroom at Knayton, near Thirsk. Mr. THOMAS STOKES, Architect, Thirsk. Quantities by Architect.

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J. W. Jackson, Thirsk, plumber and glazier.
W. Dodgson, Thirsk, slater.
J. Rutherford, Thirsk, painter.
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For Building Wesleyan Chapel and School at Laverton, near Ripon. Mr. THOMAS STOKES, Architect, Thirsk.

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H. Dalton, Ripon, plumber and glazier.
Baynes & Rawe, Ripon, slater.
W. T. Wilson, Kirkby Malveard, painter.
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Hollis Bros. & Co., Leicester	922	0	2
Bryson, Jameson & Co., Hull	900	8	5
J. Griggs & Co., Loughborough	897	6	8
Bennetts & Co., Grimsby	880	18	4

LLANISHEN.

For Erecting House, Shop and Stables at Llanishen, for Mr. E. Williams. Mr. A. S. MEAD, Architect, Cardiff.

Gould & Burns	£882	8	2
Cox & Bards	827	12	6
Hatherley & Carr	797	0	0
Richards & Co.	785	0	0
S. Hanson	765	3	0
T. Cod	761	13	0
Powell & Mansfield	726	1	9
T. WOOD & SON (<i>accepted</i>)	675	0	0

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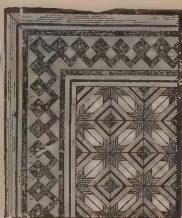
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W. Scrivener & Co.	3,224	0	0
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T. White & Son	3,140	0	0
T. Tyerman	3,083	0	0
F. T. Chinchin	3,045	0	0
H. E. Tomes & Son	2,933	0	0
W. Wells	2,895	0	0
G. Godson & Sons	2,863	0	0
G. NIXEY (<i>accepted</i>)	2,678	0	0
E. Lawrance & Sons (<i>withdrawn</i>)	2,590	0	0
B. E. Nightingale (<i>withdrawn</i>)	2,495	0	0

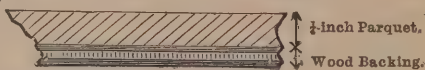
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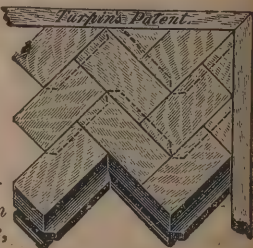
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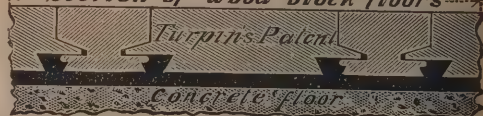
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Telegrams, "IRON, WELLINGBORO."

LONDON—continued.

For Alterations and Additions at the North Star Hotel, Finchley Road, N.W., for Mr. J. T. Vincent. Mr. ALBERT E. PRIDMORE, Architect, 2 Broad Street Buildings, E.C.
Quantities by Mr. R. J. STAMP.

London & Co.	£2,398	0	0
Marchant & Hirst	2,283	0	0
Davenport	2,176	0	0
Gould & Brand	2,146	0	0
Drew & Cadman	2,132	0	0
Courtney & Fairbairn	1,833	0	0
S. R. LAMBLE (accepted)	1,749	0	0

For Additions and Alterations to Board School, Waterloo Road, Hammersmith.

J. Shillitoe & Son	£12,230	0	0	A	£160	0	0
Holliday & Greenwood	11,694	0	0	202	0	0	0
W. Downs	11,420	0	0	160	0	0	0
Holloway Bros.	11,345	0	0	208	0	0	0
Lathey Bros.	11,273	0	0	172	0	0	0
R. A. Verbury & Sons	11,112	0	0	195	0	0	0
Atherton & Latta	10,950	0	0	176	0	0	0
J. Longley & Co.	10,807	0	0	195	0	0	0
B. E. Nightingale	10,798	0	0	190	0	0	0
C. Cox	10,250	0	0	176	0	0	0
E. Lawrance & Sons	10,154	0	0	176	0	0	0

A.—Extra for Brickwork in Cement.

For Building Board School, &c., Fircroft Road, Tooting.

Atherton & Latta	£22,603	0	0	A	£346	0	0
Grover & Son	20,115	0	0	350	0	0	0
Holliday & Greenwood	20,079	0	0	310	0	0	0
Lathey Bros.	20,048	0	0	312	0	0	0
Hart Bros.	20,036	0	0	270	0	0	0
Holloway Bros.	19,914	0	0	312	0	0	0
W. Down	19,679	0	0	305	0	0	0
G. E. Wallis & Sons	19,586	0	0	310	0	0	0
Stimpson & Co.	19,499	0	0	415	0	0	0
E. Lawrance & Sons	19,102	0	0	312	0	0	0
W. Gregar & Son	18,756	0	0	—	—	—	—

A. Extra for Brickwork in Cement.

NELSON.

For Painting Peniel Chapel and Vestry at Nelson, Wales.

S. A. Griffiths, Treforest	£82	0	0
W. E. DENHAM, Nelson, Treharris (accepted)	56	10	0
F. A. Clarke, Maesycwmwr	47	0	0
J. M. Allardyce, Treharris	37	10	0

RUABON.

For Building New Court-house. Mr. R. LLOYD WILLIAMS, County Surveyor, Denbigh.

T. Brown, Chester	£3,330	0	0
J. F. Jones, Cefn	1,935	0	0
J. Davies, Ruabon	1,894	0	0
Gethins, Shrewsbury	1,860	0	0
Jenkins & Jones, Ruabon	1,795	0	0
W. ROGERS, Wrexham (accepted)	1,695	0	0

SLAITHWAITE.

For Erection of a Warehouse and Three Shops, Britannia Road, Slaithwaite, for the Colne Vale Corn Millers, Limited.
Mr. J. BERRY, Architect, 9 Queen Street, Huddersfield.

Accepted Tenders.

J. Ellis, Linthwaite, mason.
J. Varley & Son, Slaithwaite, joiner.
F. Goodall, Marsden, plumber.
J. Walker, Slaithwaite, plasterer and painter.
W. E. Calvert & Co., Folly Hall, ironfounder.
J. Cooke, Huddersfield, concreter.
Total, £2,800.

ST. ALBANS.

For Sewering, Levelling, Paving, Metalling, Flagging, Channelling, making good and providing proper means for Lighting Beaconsfield Road, for the Corporation.

J. Dickson, St. Albans	£478	0	0
G. CAPPER, St. Albans (accepted)	438	10	0

SWINDON.

For Erecting an Infant School and Alterations and Additions to the Haydon School, for the Rodborne Cheney School Board. Mr. WILLIAM DREW, M.S.A., Architect to the Board, 22 Victoria Street, Swindon.

W. Gerring, New Swindon	£845	10	0
H. Flewelling, Wootton Bassett	730	0	0
C. Williams, New Swindon	724	17	0
W. CHAMBERS, New Swindon (accepted)	615	0	0

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SWINDON—continued.

For Additions to the Eagle Tavern, Regent Street, New Swindon, for Mr. H. W. Thomas. Mr. WILLIAM DREW, M.S.A., Architect, Swindon.

C. WILLIAMS, New Swindon (accepted) . . . £865 17 0

THIRSK.

For Building House, &c., near Thirsk Junction, for Mr. John Ellis. Mr. THOMAS STOKES, Architect, Thirsk.

Accepted Tenders.

W. Jackson, bricklayer, mason and plasterer.

R. Lee, Thirsk, joiner.

R. Pickersgill, Stockton-on-Tees, plumber and glazier.

Baynes & Rawe, Ripon, slater.

C. Long, Thirsk, painter.

Total, £625.

WAKEFIELD.

For Making and Draining a New Street at Thornes, Wakefield. Mr. JOHN VAUGHAN, Surveyor, Gaskell Villas, Thornes.

J. Speight, Leeds . . . £449 0 0

Henson, Leeds (too late) . . . 360 6 5

F. Taylor, Wakefield . . . 341 0 0

W. Kitson & Son, Wakefield . . . 330 3 5

E. Hindle, Horbury . . . 310 6 0

T. & G. WILSON, Wakefield (accepted) . . . 305 10 0

WELLINGBOROUGH.

For Taking-off Roof of Western Tower, Wellingborough Union Workhouse, and Taking-down and Rebuilding about 4 Feet of the Walls, and Reroofing and Making all Good. Messrs. SHARMAN & ARCHER, Architects.

R. Marriott, Wellingborough . . . £119 0 0

J. Hudson, Wellingborough . . . 71 10 0

W. E. Giles, Wellingborough . . . 69 0 0

W. Stevens, Wellingborough . . . 53 15 0

G. HENSON, Wellingborough (accepted) . . . 52 4 0

WEYBRIDGE.

For the Construction and Repair of a Culvert and Roadway in Walton Lane, Weybridge, for the Weybridge Urban District Council. Mr. J. S. CRAWSHAW, Surveyor.

J. W. Young, Weybridge . . . £72 15 0

W. Greenfield, Weybridge . . . 69 15 0

J. Jackson, Weybridge . . . 65 0 0

S. BROWN & SONS, Weybridge (accepted) . . . 48 0 0

Surveyor's estimate . . . 75 15 4

WIMBLEDON.

For Building Caretaker's Cottage, Dundonald Recreation Ground, Wimbledon, for the Wimbledon Urban District Council.

Julyan & Lockyer, Plumstead . . . £474 10 0

E. P. Bulled & Co., Croydon . . . 397 0 0

J. Burgess, Wimbledon . . . 340 0 0

F. Dale, Wimbledon . . . 325 0 0

J. MILLEDGE & SONS, Wimbledon (accepted) . . . 300 0 0

WORCESTER.

For New Classrooms, Royal Grammar School. Mr. A. HILL PARKER, Architect, 5 Foregate Street, Worcester.

Escourt & Son, Gloucester . . . £3,138 0 0

H. Stokes, Worcester . . . 2,955 0 0

Bromage & Evans, Worcester . . . 2,947 0 0

J. Kendrick, Worcester . . . 2,899 0 0

T. Vale, Stourport . . . 2,697 0 0

J. Wood & Sons, Worcester . . . 2,687 0 0

COLLINS & GODFREY, Tewkesbury (accepted) . . . 2,630 0 0

BUILDING AND BUILDERS.

AT a mass meeting of the members of the Leeds Branch of the Amalgamated Society of Carpenters and Joiners, held in St. James's Hall, it was resolved to declare a strike, the Masters' Association having declined to accede to their demand of an increase from 8*d.* to 8½*d.* per hour, although the masters offered to meet the men to the extent of an increase to 8¼*d.* The original demand of the Society was an increase to 9*d.*

AT the annual meeting of the Durham and Northumberland Archaeological Society held at Durham, the Rev. Canon Greenwell, D.D., presiding, Dr. Greenwell was unanimously re-elected president, and amongst the new members elected was the Dean of Durham, Dr. Kitchin. It was agreed that the following places should be visited:—May, Darlington and Houghton-le-Skerne; May 9, special day in Durham Cathedral (recent discoveries); June, Blanchland, Edmondbyers and Wiggleswick; July, Alsica Roman Wall and Thirkwell; August (two days), Bridlington and neighbourhood; September, Snape Castle and Bedale.

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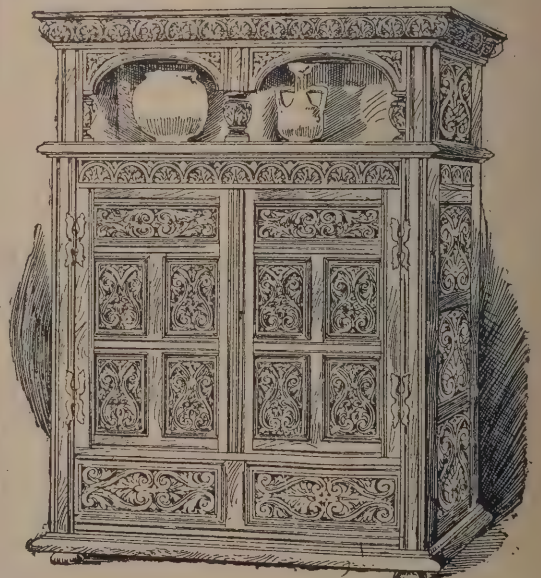
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schools at a cost of 25,000*l.* The present buildings are unable to accommodate half the students.

AT the meeting of the Horsforth District Council a letter from the West Riding County Council was read, asking if the Council had taken any steps to provide Horsforth with an isolation hospital for infectious diseases, or, if not, what they intended to do. The consideration of the letter was deferred.

ACCORDING to the *Glasgow Herald*, in June an open competition will be held for a county surveyorship in Ireland. These posts are among the best which civil engineers can get in the public service, being worth at the start from 300*l.* to 400*l.* a year. The limits of age are twenty-six and forty, and the subjects of examination, which is in two parts, and covers ten days, include several branches of science, the strength and properties of materials, and a choice between railway and marine engineering. Competition is usually very keen.

A MEETING of Dundee operative masons was held in Buchan's Hall for the purpose of considering whether there should be a strike to enforce the demand for an increase of wages. There were between 300 and 400 present. It was stated that the National Executive had agreed to give the men financial support if they decided on coming out. After a long discussion a vote was taken by ballot for or against a strike. According to the rules there must be a majority of two-thirds before a strike can take place. On the votes being counted it was found that there was a majority of over fifty against leaving their work. At present builders in Dundee have 8½*d.* per hour and hewers 8*d.*

LABOURERS working to masons, plasterers and bricklayers in Falkirk and district have struck work for an additional half-penny per hour. They are at present receiving 5½*d.* The strike will prove a considerable drawback to builders, as a large number of new buildings are presently in course of erection, and preparations are being hurriedly made with a view to readiness for the term occuparcy. Work has already been a good deal interrupted by the recent joiners' strike.

A FIRE occurred in Jamaica Street Works, Dundee, occupied by the Boase Spinning Company, Limited, and before it was extinguished damage to the extent of between 2,000*l.* and 3,000*l.* was occasioned. While the firemen were working part of a wall fell on to an adjoining roof on which Captain Ramsay, John Ramsay and John Rodger, firemen, were standing. The falling masonry went through the roof, and Rodger was precipitated to the floor below.

THE new public baths and washhouses erected by the vestry of St. Mary, Islington, in Tibberton Square, Essex Road, have been opened by Mr. Shaw-Lefevre, M.P. The building, with the quadrangle in front, covers an area of 30,000 square feet, and contains three large swimming-baths, besides private baths and a public laundry.

AT Brussels the roof of the building destined to contain an exhibition similar to "Venice" in London suddenly collapsed. Many workmen were buried in the *débris*, fifteen sustaining serious injuries.

ELECTRICAL.

THE gas committee of the St. Helens Corporation have approved of plans for putting down plant at the gasworks capable of lighting the Town Hall and the Gamble Institute by electricity, and also for meeting any further immediate demands for extension of electric supply in the neighbourhood. The Parliamentary Committee have fixed 15*l.* per annum as the amount to be paid as compensation to Mr. Thomas Parkinson, ex-assistant overseer for the township of Eccleston, who was deprived of office under the Corporation new act.

THE electric light which has been recently installed at Dover is a decided success. The works cover an area of 10,000 feet. The buildings comprise engine and machine-room, 100 feet by 30 feet; boiler-room, 100 feet by 42 feet, giving space for seven sets of engines and seven boilers; testing-rooms, secretary's offices, board-rooms, &c. There have been two sets of electric-light machinery fitted up in the engine-room worked by two high-speed condensing engines of the marine type. Each engine works large armatures, or alternators, one containing twenty-four magnetic coils and the other twenty-two coils, giving 100 alternations per second. The smaller armature is the only one used at present in the supply to the arc lamps, but in time, when there is more demand for the light, the two will be worked together. Four more sets have yet to be erected, making in all six, which are to be placed in a parallel line, the armatures working in one long groove reaching from one end of the room to the other. The plant is elaborately fitted with contrivances which test and govern the engines and condensers. The engines, erected and to be erected, comprise four 100 Kilo-Watt machines, one 75 and one 50. The whole of the work is estimated to cost about 40,000*l.*, and it is stated that there is room in the grounds to

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extend the works to twice their size if required. The town hall has been successfully lighted by electricity, and the churchwardens of Buckland have recently had light laid on to their church, where it was first used on Easter Sunday. The edifice is illuminated by means of eighty small lamps, which have given every satisfaction. Half the twenty-one lamps at present supplied with the current are kept going from sunset to sunrise—six on the Sea Front and four between there and the Market Square—and the remaining half are supplied from sunset till midnight.

VARIETIES.

WE regret to announce the death of Mr. William Saunders, M.P. for Walworth, which took place at Market Lavington on Wednesday morning last. Mr. Saunders, we understand, has been in ill health for some time past, and had only recently returned from the Riviera. The Central News Agency was founded by the deceased gentleman, but he would be more particularly known in the building trades as one of the original partners in the firm of Randell & Saunders, of Bath stone fame. Although for some years past Mr. Saunders had taken no active part in the business, he remained a partner until the amalgamation of the various Bath stone firms.

DURING the six months of the new tariff the imports of tin-plate at New York were 20,250,000 lbs. larger than in the corresponding six months a year earlier.

AN interesting exhibition of photo-ceramic enamels by various workers was opened in the Photogram Reading-room, Farringdon Avenue, last Friday. There was also a fairly representative collection of materials and apparatus for working the process, which was demonstrated at various periods during the day by Mr. W. Ethelbert Henry, who used one of Messrs. Fletcher, Russell & Co's patent gas muffle furnaces. An educational case (specially arranged by Mr. Henry) contained prints and transfers, showing the various stages in the production of photo-ceramic pictures, from the original transparency to the finished burnt-in result. Examples of under and over exposures, as well as a miscellaneous collection of "furnace failures," the cause of each being explained, were arranged by the same exhibitor, together with a useful set of "Rose-colour Test" tiles (specially prepared by Mr. Joseph P. Emery), and a series of tiles bearing specimens of fired colours by various manufacturers.

THE Glasgow Corporation have accepted the contract of Messrs. Clayton, Sons & Co., Leeds, for a three-lift gasholder, to be erected at the Tradeston Gasworks, Glasgow. The contract price is 24,028 $\frac{1}{2}$ l., the Leeds offer being 3,000 $\frac{1}{2}$ l. cheaper than those of the Scottish firms.

THE directors of the Boyne Navigation Co., Limited, are prepared to receive tenders up to June 1 for the supply and erection of twenty-seven pairs of lock-gates on their canal between Navan and Drogheda; also for sundry repairs to locks.

THE chimes at the Royal Exchange, which have been in existence for fifty years, have recently broken down, and the Gresham committee, which has the control of the fabric, has decided to improve and enlarge them. Hitherto, only four tunes have been played—"The Old Hundredth," "God Save the Queen," "Auld Lang Syne" and "The Roast Beef of Old England." The new arrangements contemplate twenty-one chimes, divided into a week of English, Scotch and Irish airs, each day playing a distinctive air. On Sunday the chime will be to a sacred tune, viz.:—"When I Survey the Wondrous Cross," "Hanover" and "Abide with Me." The chimes will be rung thrice daily—at nine in the morning, at noon, and at nine o'clock at night. They will be in working order soon.

ALL the plumbers at Leicester have ceased work under the lock-out notice of the employers in consequence of some of the men having struck work through the employment of a non-unionist. No effort at conciliation has been made. The joiners and carpenters still remain out, and their strike, which has already lasted five weeks, threatens to be very prolonged, a number of fresh issues having been raised. The employers threaten to introduce free labour. The unionists object to any piecework.

THE water committee of the Glasgow Town Council paid a visit to Killearn, and turned on the water into the Blane Valley section of the new Loch Katrine Aqueduct. This section forms part of the duplicate aqueduct from Loch Katrine, and is 5 $\frac{1}{2}$ miles long. The total length of the new aqueduct is 23 $\frac{1}{2}$ miles, so that the Blane Valley section is about one-fourth of the whole length. The aqueduct is in great part in tunnel. Altogether there are five tunnels, the longest being 1 $\frac{1}{4}$ mile. This section includes about five furlongs of a double line of 48-inch pipes and two bridges. The bridges are the only exposed parts of the aqueduct, it having been found advantageous to have as little of the work exposed to the weather as possible, as long

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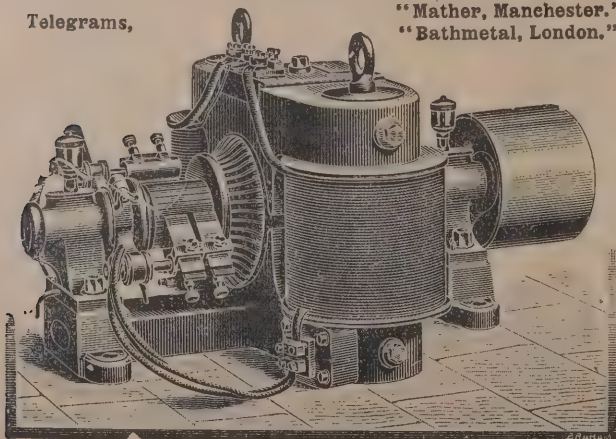
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aqueduct bridges are affected by either heat or frost, as has been proved by the old aqueduct. The tunnel is lined inside with concrete for 75 per cent. of its whole length, this concrete lining being put in where the rock is soft, and crumbles when the air gets freely at it. The contract was let in March 1890, so that it has taken five years to finish. Mr. James Young, Glasgow, was the contractor, and Mr. John Pollock, manager. The total cost of this section has been 160,000*l.*, or 30,000*l.* per mile. The total length of the new aqueduct now open is 13½ miles, leaving 10½ miles still to be completed.

THE committee appointed to raise a fund sufficient to have the bridges at Bonhill and Balloch free from pontage on May 15 have been notified by the county treasurer that the amount required is 300*l.* This is a larger sum than the committee were calculating upon, but it is not expected there will be any difficulty in raising the deficiency.

MR. J. YOUNG will read a paper, entitled "The Dwelling-house from a Sanitary Point of View," at the next meeting of the Sanitary Inspectors' Association, which will be held at the Carpenters' Hall on Saturday.

A CATHEDRAL is proposed for Belfast. Canon O'Hara, the rector of St. Anne's, has promised a large donation, and 1,000*l.* has been promised by Lord Shaftesbury. It is stated that the cathedral will be built on the site of the present church.

THE choir of Bristol Cathedral, which has latterly been undergoing considerable alterations, is to be reopened on Sunday. The restoration of the Lady Chapel is now completed.

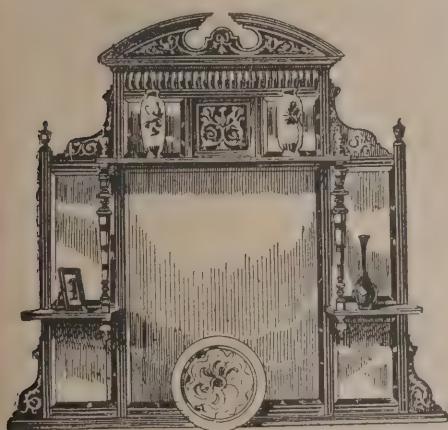
NEW CATALOGUES.

MESSRS. E. H. SHORLAND & BROTHER, of Drake Street Works, Manchester, have just published their new catalogue. We notice it is much larger than their former one, with many new designs of their patent Manchester grates, Manchester stoves and exhaust roof and other ventilators. Some of the new designs of the Manchester grates are decidedly handsome, with brass and copper canopies in repoussé work, whilst others are plainer and well suited for the public institutions for which they are specially designed; they all have projecting fireclay backs to throw the heat well into the room, in addition to their well-known warm-air ventilating arrangement. Interspersed in

the catalogue we notice the names of many leading architects and medical gentlemen, all bearing testimony to the excellency of the various appliances. Amongst their patent exhaust roof ventilators may be observed several new designs. The patent Manchester stoves are shown both single and double fronted, and with ascending and descending smoke flues in a variety of designs. These warm-air ventilating stoves, we are informed, are being largely used in hospital wards throughout the country, and are highly spoken of by those who have used them. A long list of places which have been warmed and ventilated by means of the patent Manchester grates and stoves is given in the catalogue. The catalogues are neatly bound in strong cover with index, and form a very useful book of reference for architects or anyone interested in warming or ventilation. The three different sections of the catalogue are printed on coloured paper, the Manchester grates being on white, the ventilators on pink and the Manchester stoves on blue tinted paper

THE WORKS DEPARTMENT OF THE COUNTY COUNCIL.

THE half-yearly report of the works committee of the London County Council on all the works which have been completed up to date has been presented. According to it the total estimated cost of the works was 176,886*l.*, while the actual cost amounts to 178,863*l.*, or an excess over the estimates of 2,777*l.* The committee instructed the manager to report to them the reasons for the increase of expenditure, and, in the course of a long statement of the causes which have contributed to the excess, he says that when the estimates were made up for the works the prices were based on the assumption that the workmanship and materials to be put in them would be accepted as satisfactory provided they were equal to those in the best specimens of buildings of their class in London. This, however, was found to be a delusion, and, instead of workmanship and materials of good ordinary quality being approved, workmanship of the highest standard and materials of the very best quality were demanded by the officers supervising the works. This same rigorous inspection was applied to all departments of the works, and, while it may have been prompted by a desire on the part of the officers to discharge their duties in the most zealous manner, in the opinion of the manager it had a most disastrous effect on the cost, and if the system had been designed to make the work



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carried out by the Department cost as much as possible nothing could have been invented better calculated to bring about that result. The manager further states that other portions of the excess were due to the fact that for some time after the Works Department was established there was a tendency on the part of the skilled workmen not to do the same amount of work for the Council as they would be expected to do for a contractor, and it was only after repeated dismissals that this idea was shaken. With the unskilled labour there was, generally speaking, no cause for complaint. The statement concludes with the remark that the visits of individual members of the Council to the works are apt to be misconstrued. The men, he alleges, store up real and fancied grievances and relate them to the councillors in a most exaggerated form. The effect is most pernicious, and the manager thinks that very much better results would be obtained if councillors would refrain from entering into conversation with the men, who have ample means of making any complaints. The total deficit, including the initial expenses of starting and organising the Department, amounts to about 1¼ per cent. The committee think it is clear that painting cannot be done by the Council at the lowest competition prices, but in plain work, such as excavating, road-making, concreting or sewer-work, where quality of work cannot vary much, it is clear that work can be undertaken at contract prices.

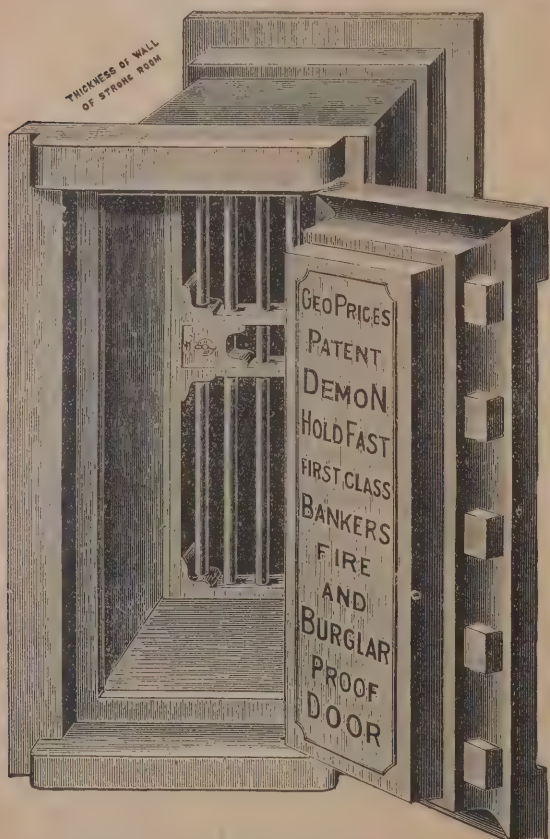
DEMOLISHING PARTLY-ERECTED HOUSES.

FOR some time the main roads committee of the Flintshire County Council, says the *Liverpool Courier*, have been concerned with some new buildings which were being erected at Buckley for Mr. F. L. Hancock, a gentleman well known in hunting circles and resident at Wold House, Hawarden. The committee endeavoured to dissuade Mr. Hancock from encroaching, as they contended, upon the public highway in the building of the houses, but the work was proceeded with, with the result that it culminated in a novel and amusing scene a few days ago. The main roads committee decided that the buildings, which were about half completed, should be demolished, so far as they were believed to extend upon the highway, and Mr. Robert Lloyd, main roads inspector and about eight men employed by the Council arrived upon the scene to put the edict into effect. The proposed action on the part of the authorities had become

known in the neighbourhood, and a fairly large crowd gathered to watch the proceedings, but there was no attempt to interfere with the action of the authorities. In the first place, the County Council's employes pulled up about 100 yards of wire fencing in the vicinity of the new buildings, which enclosed a ditch adjoining the road. The bricklayers at work upon the scaffolding of the new houses were then requested to cease work, an order with which they readily complied. The front portion of the buildings was then speedily destroyed, the bricks thrown into Mr. Hancock's field, and everything cleared off the ground to the extent of about 6 feet. An incident of this character has not taken place before in this part of the country, and the action of the authorities caused great interest. We would not recommend the various county councils throughout the country to adopt the above method of asserting their rights, although it certainly is a novelty as to the legal rights in such a case. We should consider that it will result in an interesting lawsuit.

THE BUTE HOUSE ESTATE, PETERSHAM.

A SPECIAL meeting of the Richmond Town Council was held on April 30 for the purpose of considering the suggested purchase by the Government of the Bute House estate and its addition to Petersham Park. The amenities committee of the Council recommended the appointment of a deputation to wait upon the First Commissioner of Works and support the request of the inhabitants of Petersham that the Bute House property should be purchased by the Government and added to the park. The committee also recommended that the deputation should submit to the First Commissioner the great public importance of preserving the rural character of the landscape as seen from Richmond Hill, especially in regard of Petersham Meadows and parts of the Marble Hill estate, and invite the assistance of the Government in the matter. The recommendations were unanimously adopted and a deputation appointed. It was further resolved that the deputation should be empowered to approach the City Corporation and the County Councils of London, Surrey and Middlesex, seeking their assistance in the matter. A letter was read from the secretary of the National Society for the Preservation of Places of Historic Interest and Natural Beauty, asking that that Society should be allowed to add a member to the deputation. This was agreed to.



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FORESTRY IN ENGLAND.

AT the meeting of the members of the Surveyors' Institution on April 29, the discussion on the paper on "Forestry," read at the previous meeting by Mr. G. Cadell, was resumed. Dr. Farquharson, M.P., as a landed proprietor, pointed out that every kind of tree wanted its own particular kind of ground, and one of the great difficulties in planting ground with trees was that of getting the proper seed. A difficult question in regard to forestry was that of the education of foresters. What was wanted was aid from the State, and public opinion upon this question should be aroused. It was necessary that the body politic should have this all-important matter brought to its attention, and that a strong public opinion should be raised which would demand that something should be done for what was really a great and important national industry. In the past tree cultivation had gone on in a wretched and haphazard way, and now the question arose how forestry was to be made profitable. There was a possibility that in the future foreign competition in regard to timber might be lessened, and that the home producer might have a fair chance with the products of his industry. Dr. Schlich (Professor of Forestry at Cooper's Hill) remarked that the preferential rates in regard to the carriage of timber given to foreign traders over English producers were simply heart-rending. There were 26,000,000 acres of waste land in England, and about one-fourth of that expanse might be easily made available for planting-out with trees. It was beyond all doubt that there were a great many areas in England which would be more profitable to plant with trees than to use for other purposes. Professor Marshall Ward, Mr. Wason, M.P., Mr. Stafford Howard (Commissioner of Woods and Forests), and other speakers joined in the discussion.

ACCIDENT AT THE BLACKWALL TUNNEL.

MUCH anxiety has been caused by the publication of an unfounded rumour to the effect that the Blackwall Tunnel had partly collapsed, and that twenty lives had been lost. The contractors (Sir Weetman Pearson & Son) have, in carrying out the work, adopted a hydrostatic shield, air-locks and other appliances, which have insured their workmen against such catastrophes. The tunnel is now being driven through Thames ballast, or, more correctly, through the puddled clay which has been put at a great expense over this thin gravel portion of the river-bed. What really happened about half-past 4 A.M. was a settlement of the clay covering into an existing cavity at the bottom of the shield where the head of river water above could not be balanced by a uniform air-pressure. This occurrence allowed a certain amount of air to "blow out," causing a water-spout about 18 feet in height. The temporary diminution of air-pressure thus caused allowed a quantity of water to get into the invert of the air-lock. As soon as the proper air-pressure was restored the tunnelling operations proceeded as before, the influx of water being pumped out by the pumps provided for such contingency.

THE BLAST AT PENRHYN QUARRIES.

A SPECIAL correspondent of the *Times* writes:—Until the afternoon of Saturday last (April 27) Y Talcen Mawr was the central point and perhaps the most striking feature of those famous quarries near Bethesda which have been in operation since the reign of Queen Elizabeth, and have changed half the rugged protuberance of the mountain called Bionllwyd into a deep amphitheatre. Many thousands of people who have visited the quarries must carry with them a memory of the Talcen. It was a rough slab-sided obelisk of grey rock, with a bold vein of white quartz at the summit. Its height from the bottom of the quarry was about 300 feet, and it was pierced at regular intervals with tunnels representing the level of operations at various periods in the past history of the quarry. At all times this great pillar of green rock presented a picturesque appearance, whether it was viewed from above or below, for the terraces, which the quarrymen call galleries, of purple slate, rising tier upon tier, one upon another, almost to the top of the mountain, formed a singularly effective background. Opinions vary as to the reason why this upstanding fragment of a dyke which ran across the centre of the quarry from north to south was suffered to

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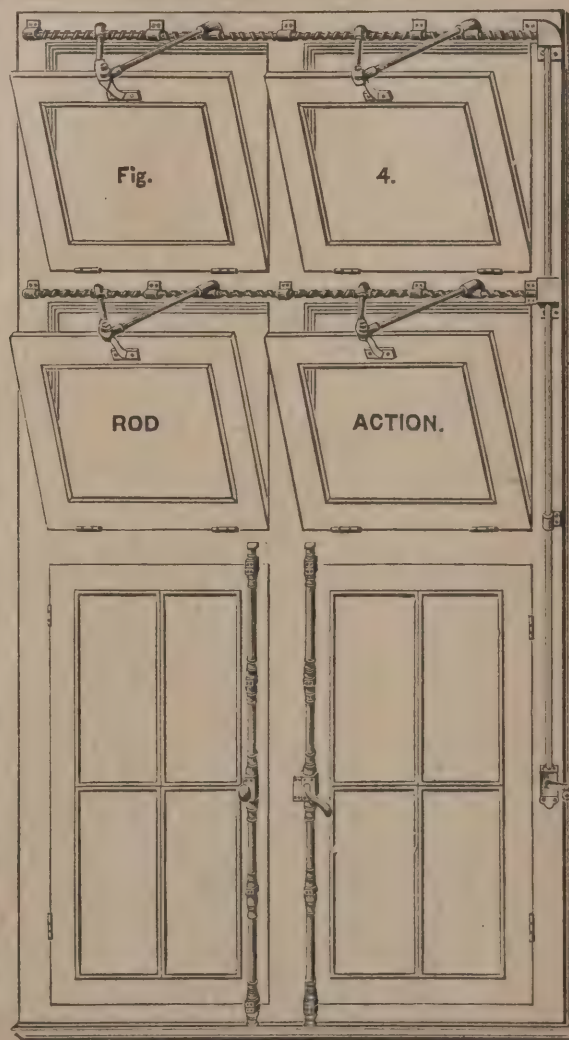
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remain, while the dyke itself was cut away on either side; but the better opinion is that a manager of the quarry who flourished at the beginning of the century, not foreseeing the colossal scale upon which the quarry would be worked in the future, hoped that this portion of the green rock might serve as a support for one side of the quarry. But the quarry grew beyond his expectations. The quarrymen cut through the dyke on either side, and left the Talcen in obelisk, which grew more and more picturesque and more and more dangerous every day and every year as the slate rock was cut away deeper and deeper at its base.

It was in August of 1894 that, after a report from Mr. E. A. Young, the chief agent, had caused Lord Penrhyn to make a personal inspection the Talcen was doomed, and the wisdom of the sentence was proved almost at once by the sudden fall, fortunately in the night, of a fragment weighing several tons, which, if it had fallen in the day, must have destroyed a large number of quarrymen. From that date till Saturday preparations for the great blast proceeded, and on Saturday the huge pillar, weighing 125,000 tons at the least, was demolished. The spectacle was imposing in the extreme. On the very brow of the quarry, fully 500 yards away from the scene of the coming explosion, and some hundreds of feet above it, a knot of privileged spectators was assembled near a flagstaff. The time was a few minutes past three. All along the brow of the quarry, and up on the slopes of the mountain above were crowds of spectators. All knew that in the bowels of the Talcen were two charges of powder, one of three tons and the other of four tons. At last the decisive moment came. The flag on the brow of the quarry was hoisted by the Hon. Miss Pennant. A blue wisp of smoke from the base of the pillar, and all present knew that the triplicate fuses furnished by Messrs. Bickford Smith & Co. had been lighted by Mr. Pritchard, and that the huge bricked-up chambers of powder specially manufactured by the Elterwater Company, and used rather than gelatine by reason of its gradual action, would do its work shortly. There was a silence of expectation for five minutes or so, an interval which was almost painful; but still the wisp of blue smoke rose lazily, and a little cascade of water on the Bethesda side of the rock fell down merrily. The minutes passed very slowly, but at last—sixteen minutes and a half after the flag had been hoisted—there was a crashing sound. The noise was not so loud as one would have expected. With it came an outburst from the base of the pillar of smoke, of minute dust and of something that was either flame

or red-hot powder of stone. Away from the top of the pillar sped two kestrel hawks which have nested there for many a year. The base of the great rock seemed to fall away as water falls from a fountain jet at its highest point. There was no sign of any stone being thrown to a great distance. Then, in less time than these words occupy in the writing, but in orderly sequence none the less, there was the roar of huge masses of stone rolling one upon another, and with it came the spectacle of the huge rock sinking and subsiding with a slowness that was almost majestic until it was a mere chaotic mass of boulders reeking with smoke, quivering and gliding downwards for many minutes like an avalanche. Another minute followed, and then the whole of the quarry was vested in a cloud of heavy and evil-smelling smoke, of which, however, the keen wind made short work.

RESTORATION OF BRISTOL CATHEDRAL.

READERS of the life of John Addington Symonds, says the *Bristol Times*, cannot but be struck with his enthusiasm for the Cathedral Church of Bristol, his yearning for it even in foreign travel and his delight at revisiting it after experience of far more imposing buildings. In his early days the cathedral, though half its present size, had twice its picturesqueness, its only approaches being down a steep flight of steps into the north transept, and a similar ascent from the cloisters into the south transept. A heavy stone screen, erected in the reign of Henry VIII., with minor prophets blazoned on the panels, and badges of the king and the youthful Prince Edward, surmounted by a later gallery and the present organ, shut in the choir from the vulgar gaze, the general effect being that of the decorous seclusion of a college chapel. The choir was then as left by the Reformation, and the episcopal throne—an erection like a four-post bed—had received all the bishops in due succession and many royal visitors. It is very gratifying to know that the ancient screen, having the initials "H. R." with the Tudor arms, and "E. P." with the badge of the Prince of Wales, deciding the date as between 1537 and 1547 (the birth and accession of Edward VI.), will be re-erected at the back of the new sedilia when sufficient funds are forthcoming.*

Many changes have taken place since those days, and before we chronicle the last phase of restoration now about to

* This screen was taken down in 1860, when the choir stalls were pushed eastwards for congregational purposes.



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be made public, it may be as well to glance hastily at the past history of this venerable building. This naturally divides itself into the pre-Reformation monastery and the post-Reformation cathedral. When Robert Fitzhardinge founded his Augustinian house on the rising ground to the west of Bristol, and began to build in 1142, he was following the example set him by his neighbour, Robert, Earl of Gloucester, the great patron of literature and the arts, who scarcely ten years earlier had begun to build the priory of St. James, to the north of the same city. Between these two monasteries in after years sprang up others, forming a continuous belt of religious houses, with their grounds sloping down to the banks of the river Frome, and making a picture difficult to rival anywhere. The House of the Gaunts, on the other side of the Green, with its orchard, still perpetuated in name; the Carmelites, with many pinnacles and spires, where Colston Hall now stands; the priory of St. Bartholomew, whose gatehouse still remains to us; the Franciscan Friars, with their noble church; and the nunnery of St. Mary Magdalen just above, and founded by Eva, wife of our Robert Fitzhardinge, make a list of which any city may be proud. Fitzhardinge died February 5, 1170, and was buried "atwix the Abbots and Piores stalles and next unto the Abbote's stalle in the intreyng into the quere." This would be beneath the western arch of the tower. Robert, Earl of Gloucester, was also buried in the choir of his church of St. James, in a tomb as seen and described by Leland.

The earliest portions of the building, parts of the south transept and staircase in the north aisle, and the gateway to the abbot's lodgings in the Lower Green, are recognised as belonging to the time 1142-48, while the later Norman (Transitional), the magnificent chapter-house, with its vestibule and the lower part of the great gateway, may be attributed to the later work of Fitzhardinge, 1155-70, when he had become enriched by the grants of the Berkeley estates. The Norman church had short transepts, still remaining in plan, and a short choir of three bays, with a square east end, as proved by the foundations discovered in forming the new pavement. In the early part of the thirteenth century an addition was made to this simple Norman church of the beautiful lady chapel, now known to us as the "elder lady chapel." The position of this chapel, east of the north transept, may be accounted for by the fact that the reverence paid to the Virgin had not reached its later development, when the place of honour, the east end of the choir, was invariably devoted to her worship. It is one of the finest specimens of the style of the thirteenth

century, even in its present mutilated condition, for originally it was detached from the north wall of the church, and certainly suffers by amalgamation with the main building. This chapel has been restored in a very conservative spirit, if we may except the removal of a sixteenth-century doorway of very inferior character, thereby causing certain antiquarian regrets. The boldness and depth of mouldings, relieved by exquisite foliage and grotesque figures, are well worthy of study, and remind one much of the north porch of Wells.

It would be to little purpose here to recount the several abbots who ruled the House until the dissolution, in 1539. The great builder to whom we are indebted for the church east of the transepts is Abbot Edmund Knowle, 1306-32. He has left a beautiful example of the Decorated style. The Norman choir had become ruinous, and possibly was considered of too small proportions for the increasing ritual requirements. It was, therefore, taken down and replaced by the present choir, with its aisles of equal height, the lateral stone transoms acting as internal flying buttresses to take the thrust of the central vault. The richness of the windows is enhanced by the use of a transome pierced with tracery, and the walls are relieved by deeply-recessed arches of the peculiar form known as the "Berkeley arch." The late Archdeacon Norris pointed out that Bishop Gower, who was at this time rebuilding the nave of St. David's Cathedral, was a friend of Knowle's, and reproduced these recesses in his own work. It is curious to conjecture the possibilities which might have arisen to this church had the abbot not declined sepulture to the body of King Edward II. The wealth which poured into the abbey of St. Peter at Gloucester would then have been diverted to Bristol, and the church might have been rebuilt on a far grander scale. Abbot Knowle died in 1332, and was buried, according to the roll of Abbot Newland (discovered a few years ago at Berkeley Castle), "under a brode marbull stone streight afore the rode auter." Tradition has assigned to him a place by the high altar; and as, at the Reformation, the holy table was erected at the extreme east end, the tomb of the abbot on the north side was assigned to Knowle, whereas the high altar undoubtedly stood immediately beneath the enriched groining between the fourth and fifth bays, to which position the holy table is now happily restored. But it was "afore the rode auter" that Knowle was buried, and this was an altar west of the rood screen, which doubtless formed its reredos. No such mistake attaches to the tomb of Abbot Newland, 1481-1515, whose rebus of a heart pierced with nails

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(Nailheart) occurs on the effigy on the south of the eastern lady chapel. But before this "new works" were being constructed by Walter Newbury (abbot 1428-73), stone in quantities being brought from Dundry, no doubt for the reconstruction of the nave in continuation of Knowle's work. During his abbacy the central tower was rebuilt. To Abbot Elyott (1515-26) we owe the stalls and the interesting miserere carving, illustrating the tale of Reynard the Fox, so popular in the Middle Ages. According to the roll at Berkeley Castle, Abbot Newland "bielded the gate house," by which is meant, no doubt, the upper part, and possibly he may have reworked the Norman mouldings below, as suggested by the late Mr. E. W. Godwin, who gives good reasons for this opinion in a paper published in the *Archæological Journal*, vol. xx. He is also supposed to have reconstructed the roof, with the vaulting, and the windows of the transept. This brings us to the dissolution, when Henry VIII. converted the building into a cathedral for the use of the newly-created see of Bristol, which with Gloucester was carved out of the diocese of Worcester. The work of rebuilding the nave was then discontinued, and it appears probable that what was still standing of the old Norman nave was taken down, but by way of substitute a short nave was formed by placing the altar at the extreme east end, erecting a great screen across the second bay from the tower, the stalls occupying the two next eastern bays.

In 1850, when Dean Elliot came to Bristol, he found the cathedral in a dilapidated and disgraceful condition. The walls and piers were covered with yellow wash, the windows were decayed and broken, and the east end of the building was overlaid with earth to a depth of several feet. Between 1860 and 1866 the Dean reglazed all the windows, with the exception of the great eastern window, removed the earth from the east end, and discovered and restored the beautiful sedilia on the south side of the eastern lady chapel, as well as the tomb on its north side. He also removed the yellow wash from pillars, walls and groining, and caused the roof to be decorated and its bosses gilded. The old bishop's throne and organ screen were removed, the stalls rearranged with much new carving, and provision was made for lighting and warming the cathedral.

Besides these improvements, the eastern cloister was restored and glazed, and—most important, perhaps, of all—the large piers under the central tower were underpinned and rendered secure. No less than 20,000*l.* was spent upon these works.

In 1866, Canon Norris started a bold movement for rebuilding the whole of the nave, instead of two or three bays, as previously proposed by the Dean and Chapter. The work was entrusted to Mr. Street, who with great judgment determined to follow Knowle's construction. Mr. Street's design included two western towers. The nave and the western towers up to the level of its roof were completed in 1877, at a cost of 48,000*l.* In 1886 Mr. J. W. Dod offered 5,000*l.* towards the completion of the western towers, in accordance with Mr. Street's designs. Further sums were raised, and by June 21, 1888, Mr. Pearson, who on the death of Mr. Street had become the architect to the Chapter, carried out this work at a cost of 8,000*l.* In the same year a sum of 3,100*l.* was expended in effecting the complete restoration of the fifteenth-century gate-house and the old Norman archway of the abbey. Thus during the lifetime of the late Dean some 88,000*l.* were spent on the cathedral.

If we except the restoration of the north transept in 1890, with its beautiful window filled with stained-glass by Powell, given by the Dolphin Society to the memory of Colston, no important work was carried out in or about the cathedral after this until June 13, 1892, when a meeting was held in the Merchant Venturers' Hall, at which the Lord Bishop of the diocese presided. The ruinous and unsafe condition of the central tower and elder lady chapel and the defects in the choir arrangements were duly considered, and it was resolved that "the cathedral be without delay restored." This spirited resolution has not been allowed to fall through. By March 1893 the present dean, Dr. Pigou, was able to commence the restoration of the tower and elder lady chapel; not long afterwards the new choir arrangements were undertaken, and the restoration of the north cloister, all of which works are now completed.

The restoration of the tower is perhaps one of the most successful of the day. Every stone of the old tower that was sound has been carefully preserved and replaced. The new stone used has been taken from the same quarry on Dundry as that from which the tower was originally built, and the pitch of the lofty north-east pinnacle has been carefully preserved from the indubitable evidence of the stones at its base found *in situ*. The result is most harmonious and imposing. In the restoration of the elder lady chapel also great care has been taken to leave untouched the beautiful and almost unique carving in the capitals and spandrels of the arcades, and the introduction of an additional order in the fine western archway, though a



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bold stroke, must be admitted to be an æsthetic improvement, as well as justified by the necessity of strengthening an arch which has to transmit the thrust of the tower to the new and massive external buttress. The east window, by Hardman, is a beautiful specimen of modern glass. Coming to the choir, a very fine effect has been obtained by restoring the altar to its proper position, seen through a vista of handsome choir stalls, and standing on a sumptuous marble base. In this respect Bristol now surpasses many other English cathedrals.

The restoration of the central tower (completed July 1892) cost 4,896*l.* That of the elder lady chapel (opened January 6, 1892), cost 1,866*l.*, to which must be added 220*l.* for the grilles and 30*l.* for the altar rails. The marble paving of the choir (by Davison, who did the work at Truro and St. Paul's) has cost 1,300*l.*, and the reconstruction of the stalls, by Luscombe, of Exeter, from Mr. Pearson's bold and handsome designs, 1,389*l.*

Two artistic wrought-iron screens separate the choir from its aisles east of the stalls, and a dossal and side curtains have been temporarily provided. The whole building is now lighted by electricity, the brass electroliers being the work of Singer, of Frome. Thus far the total cost of this present restoration has reached about 12,000*l.*, of which a debt remains of at least 1,200*l.*

Much has been done, but indeed much remains to be done. A choir screen (the base only of which has been erected), a reredos, sedilia, bishop's throne, pulpit, organ and bells have still to be provided; and, in addition to these internal improvements, it is estimated that about 5,000*l.* should immediately be spent on the restoration of the eastern exterior of the building.

QUARRYING.*

At the very outset let me point out that it is by no means easy to define exactly what a quarry is. You will probably say that that is a somewhat strange prelude, when the lecturer candidly confesses that he cannot explain precisely what he is going to talk about; but I will tell you in a moment where the difficulty lies and why it is necessary to lay some stress upon

* One of a course of five lectures on "The Sanitation of Industries and Occupations," delivered before the Sanitary Institute by Mr. C. Le Neve Foster, B.A., D.Sc., F.R.S.

this question of definition, "What is a quarry?" If I were to put this question to you most would reply without hesitation, "A quarry is a place where stone is dug." This is a good popular definition; the classical scholar might base his reply upon the origin of the word and say that it has come down to us from the Low Latin word "quadraria," meaning a place where squared stones were "got," the verb "quadrare" signifying "to make square." The "quadrarius" or "quarryman" was originally the stone-cutter who trimmed stones into shape for building purposes. It is easy to understand that the term quarry eventually denoted any excavation made for getting stone, whether dressed into cubical or parallelopipedal forms or sent into the market in irregular lumps.

When we come to look at the question from an official point of view, the popular explanation has to give way to strict definitions laid down by Acts of Parliament or ascertained by legal decisions.

In the first place many excavations, which are popularly known as "quarries" because stone is obtained from them, are legally "mines." We thus at once must make the distinction between—(1) Workings open to the sky; (2) workings underground.

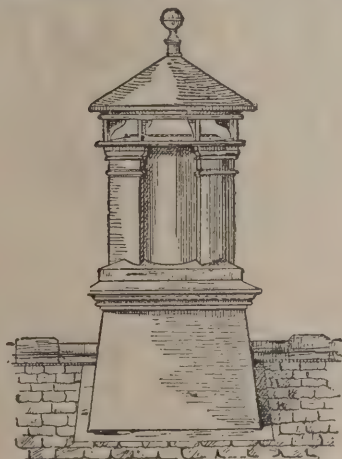
Judicial decisions have settled very clearly that in this country it is the nature of the excavation which determines whether any given workings are a "mine" or not. If the mineral is obtained by underground passages and chambers under a cover of rock, the workings are legally "mines." Where stone is obtained such workings are popularly known as "underground quarries," and they are more numerous than many persons think. About one-third of the slate of Wales and most of the Bath stone is nowadays quarried in underground chambers, that is to say legally it is "mined."

On the other hand, if we cross the Channel a different state of things prevails. Workings for minerals in France are classified according to the nature of the substance and not according to the nature of the excavation. If iron ore is being worked, the undertaking is designated a mine, even if it is merely a shallow pit open to daylight, whereas underground workings for stone, no matter their depth and complexity, enter into the category of "quarries."

This essential distinction between the laws of the two countries must be borne in mind in making international comparisons of death-rates from diseases or accidents.

Having pointed out that much stone is got by true mining operations, let me now turn to workings which are open to the

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sky. There are no less than three legal definitions of "quarries," which I will take according to the dates of the statutes.

1. *Factory and Workshop Act*, 1878 (41 Vict. ch. 16), fourth schedule (25):—"Quarries, that is to say, any place not being a mine, in which persons work in getting slate, stone, coprolites, or other minerals."

2. *Quarry (Fencing) Act*, 1887 (50 & 51 Vict. ch. 19), section 4, says:—"The term 'quarry' includes every pit or opening made for the purpose of getting stone, slate, lime, chalk, clay, gravel or sand, but not any natural opening."

3. *Quarries Act*, 1894 (57 & 58 Vict. ch. 42), section 1, reads thus:—"This Act shall apply to every place, not being a mine, in which persons work in getting slate, stone, coprolite or other minerals, and any part of which is more than 20 feet deep."

It is not necessary for my purpose to-night to bind myself closely to any one of these definitions; I merely point them out to confirm my opening statement that it is not easy to state exactly what is meant by a "quarry" in the United Kingdom.

I think that it will be convenient, for the purposes of this lecture, to regard as quarries any underground workings for stone, and all other workings for minerals which are directly open to the sky, and which may conveniently be comprised under the term "open works."

2. Kinds of Minerals Worked.

The minerals we have to deal with are very varied; indeed it may be said that practically every kind of mineral has at the outset been got by open workings, and even at the present day very large quantities of metallic ores are obtained in that manner without any burrowing underground.

Among the minerals worked opencast are alumstone, asbestos, brick-earth, chalk, clay (including china-clay, fire-clay, fuller's-earth, potter's clay), coal, and more especially brown coal, copper ore, gems, gold, gypsum, iron ore, iron pyrites, lead ore, nitrate of soda, phosphate of lime, stone of all descriptions, strontium sulphate, tin ore.

From a geological point of view the deposits worked are likewise very varied; sometimes they are stratified and have been formed by the deposition of sediment in old seas or rivers, by the growth and accumulation of animal or vegetable organisms, or by precipitation from solutions; in other cases we have to deal with rocks which were at one time in a fused or plastic condition, and which are said to be of igneous origin. In fact, any portion of the earth's crust which can be utilised

in the arts or manufactures may be obtained by a quarrying process.

3. Processes of Excavation.

With substances varying in nature from the loose sand to hard granite, it is evident that the processes employed in "getting" must be numerous. The excavation may be effected by manual labour or with the aid of machinery. The simplest hand tool is the crowbar. It is thrust into cracks and joints, and by using it as a lever blocks of stone are prized off. Next come the pick and shovel, familiar tools in almost all workings for minerals, differing more or less in form according to the precise substance for which they are used. Wedges driven in by sledge hammers may be called to the aid of the quarryman to detach his blocks of stone; and lastly we come to blasting operations, by which so much mineral is forcibly wrenched off from its bed.

The jumper, that is to say, a bar of iron steeled at the end and forged into a chisel-shaped "bit," is an implement frequently seen in open works for boring holes to receive the explosive; short holes are likewise made by striking a steel chisel (borer) with a steel hammer or sledge.

The powerful explosives, which owe their strength in the main to nitro-glycerine, such as dynamite, blasting gelatine and its congeners, though very largely used, have not yet displaced the old-fashioned gunpowder. The latter holds its own in many cases where the rock has to be wrenched off gently, so to say, and where the smashing action of the high explosives would more or less spoil the material which has to be extracted.

The excavating machines used in quarrying may be classified as follows:—

1. Diggers. 2. Dredgers. 3. Boring machines. 4. Groove cutters.

1. Steam diggers, known sometimes in this country as "steam navvies," and in the United States as "steam shovels."

These gigantic diggers are employed not only by railway and canal engineers, but also by quarry owners. Sometimes their business is simply to remove over-burden; in other cases they dig up the valuable mineral itself, such as iron ore or even auriferous gravel. In the Mesabi Range, Minnesota, iron ore is excavated in open workings and at once loaded into railway waggons by the steam shovel.

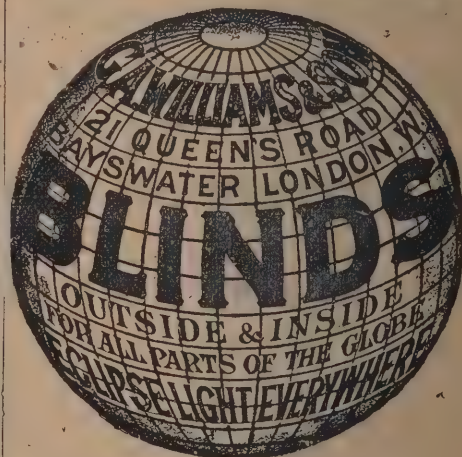
2. One naturally associates the dredge with workings under water, but in addition to being used for excavating gold-bearing sand and gravel from river bottoms, it may render useful services upon *terra firma*. A dry dredge with an endless chain

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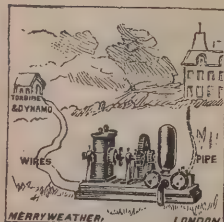
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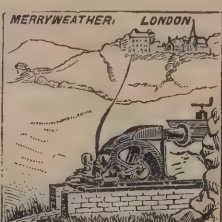
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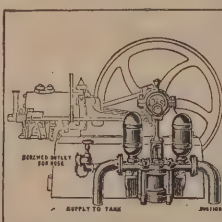
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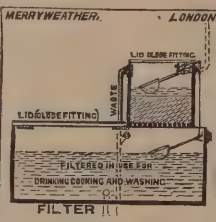
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of buckets is employed for stripping off a thick layer of gravel covering a bed of brown coal near Cologne, and Priestman's grab dredge might have been seen not long ago digging up brick earth in the vicinity of London.

3. Rock drills—that is to say, machines which bore holes for blasting—are at the present day rendering immense services to the quarryman. They relieve him from a toilsome labour, and insure a rapidity of work which was previously unknown. An ordinary percussive rock-drill is merely a cylinder with a piston driven backwards and forwards by steam or compressed air, and a cutting chisel attached to the piston-rod. The chisel is therefore made to strike its blows mechanically with great force, and the number of shot holes which can be bored in a given time is very great.

4. Though rock suitable for many purposes can be obtained by ordinary blasting, this process is out of place when it is necessary to quarry such a material as marble. Blasting would get out irregular lumps and would shatter the rock, or at all events produce cracks, whilst the object of the worker is to obtain perfectly sound blocks of parallelopipedal form. Various groove-cutters are in use, which enable the quarryman to effect his purpose. An old machine, but one still largely used in the United States, is the Wardwell channelling machine. It is an appliance in which steam power replaces manual labour in working jumpers. Three or five chisels are arranged side by side, and are lifted and dropped by a steam cylinder so as to chip out a vertical groove. Smaller machines have now been brought out by the Ingersoll and Sullivan companies.

Instead of chipping out a long groove, it is sufficient in many cases to bore out a series of holes along a given line, and then break down the intervening partitions with a special tool. Machines for this purpose are largely used in the United States.

A large circular-saw mounted upon a suitable carriage which cuts vertical grooves 30 inches deep is likewise of American construction. One of the most ingenious groove-cutters is Wilmart's wire saw, which has been employed with success at a Belgian marble quarry for upwards of ten years. Three iron or soft steel wires, each a quarter of an inch in diameter, are twisted into a strand and are made to form a long, endless cord, which is drawn by machinery over the surface of the rock, whilst sand and water are fed on to it continuously. The sharp grains of sand are caught in the interstices between the wires, and as they are dragged along they cut the stone which lies in their path. Then pulleys which guide the wire

saw are fixed upon frames in little pits specially excavated for the purpose at each end of the cut, and are duly lowered as the work proceeds, so as to keep the wire cord upon the bottom of the groove.

Two other special methods of excavation deserve mention, viz. processes depending upon the action of heat and upon the action of water.

It is probable that "fire-setting" is one of the oldest forms of mining and quarrying, and in spite of the discovery of the new and more powerful explosives it has not entirely died out. The effect of the fire is to crack and split the rock, and to render it easily removable by the pick, crowbar or wedge.

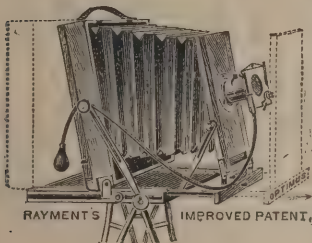
In the island of Naxos emery is quarried exclusively by fire-setting. A pile of brushwood is heaped up against the rock and lighted. When it has burnt out in about two or three hours water is thrown upon the heated rock, and the sudden chilling produces fractures which enable lumps of emery to be got out easily. Jade is quarried in Burmah, and stone in India in the same fashion.

Water serves a useful purpose for getting china clay in Cornwall and Devon. The granite in these counties is sometimes thoroughly decomposed, owing to the conversion of the felspar into kaolin. Where the existence of such a mass of suitably decomposed rock has been proved, the over-burden is stripped off and a shaft sunk; its bottom is put into communication by a tunnel with another shaft, sunk in the adjacent hard granite and fitted with pumps. Water is led on to the soft decomposed granite which the workman loosens with a pick; the milky stream flowing away from the working face is led into a settling pit near the top of the first shaft, where it deposits coarse grains of quartz. It now drops down the shaft, runs along the tunnel, is pumped up to the surface and led away to settling pits.

The hydraulic mining of the United States is carried on by playing upon banks of gold-bearing gravel with jets of water under considerable pressure. Vast works are undertaken to provide adequate supplies of water, which is stored in high reservoirs created by artificial dams and then led for miles by ditches to the points where it is required. Valleys are crossed by iron pipes or by troughs carried by trestles.

The huge jet of water issuing from a nozzle under the control of a workman is directed against some part of the gravel band and made to undermine it. Great masses fall and are disintegrated by the spouting water; the result is a muddy stream, which flows away hurrying along with it sand, gravel

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and boulders, and all the gold. It is conducted into long lengths of wooden troughs, specially arranged for catching the gold by the aid of quicksilver.

These two processes by fire and by water are exceptional. I now proceed to say a few words about the ordinary methods of arranging the quarry workings.

4. Methods of Arranging the Workings.

As already stated, the mineral may be quarried in two ways:—

1. By pits open to the sky.
2. By underground mining.

The shape assumed by the actual excavation must depend greatly upon the nature of the mineral and its solidity. Hard solid rock, like limestone or granite, may be allowed to stand up in high and almost vertical faces, whereas less stable materials, such as clay and sand, would slip in or run in if one tried to treat them in like manner.

A very simple process of working is that adopted in Chili for obtaining nitrate of soda. The impure nitrate (*caliche*) is found in beds from 6 inches to 12 feet thick beneath a covering of hard conglomerate (*costra*) from 1 to 10 feet thick. A small shaft is sunk a little below the bottom of the *caliche*, and enlarged in order to receive a charge of slow-burning powder made on the works. The explosion loosens and breaks up the ground over an area about 20 yards in diameter. The hard overlying stratum of *costra* is then easily removed, and the *caliche* is broken up into lumps, which are taken to the lixivating and crystallising works.

Working in steps, stopes, terraces, benches, lifts or galleries, for all the terms are used, may be looked upon as the typical method of quarrying, and we may find examples in the case of many kinds of ores and stones.

The great Penrhyn slate quarry near Bangor is well known to all tourists in North Wales. The valuable slate and the valueless over-burden are both taken away by a series of terraces on an average 60 feet high by 30 feet wide.

The lead-bearing sandstone of Mechnich was at one time worked open-cast on a very extensive scale. At the present time the underground workings are of more importance.

The famous iron ore of Styria is mainly worked open-cast, or to use what is now the legal expression in this country, is "quarried." There are in all nearly fifty terraces, in fact the workings may be looked upon as a gigantic flight of stairs 1,500 feet high, the tread of each step being on an average

36 feet. These workings in Styria produced in 1891 about three-quarters of a million tons of iron ore. If the rock is firm enough to stand alone for a great height, it is sometimes taken down in one vertical slice, without making a series of steps.

Much chalk is quarried in the neighbourhood of Rochester, for instance, in a somewhat similar fashion.

A last method of quarrying is by gigantic blasts, which bring down thousands of tons of stone at a time. It is practised in some limestone quarries in this country, both in North Wales and in Derbyshire. A tunnel is driven in to the face of the quarry, and a chamber is excavated for the reception of explosives. The tunnel is now filled up with earth or masonry, or both, and the charge is fired by a long fuse, or by electricity. The result is the displacement of thousands of tons of rock, the clearing away of which may occupy the quarrymen many months.

In quarrying limestone near Messina, a charge of 31 cwt. of powder in bags was placed in a special chamber at the end of the tunnel, driven into the face of the quarry, and the tunnel having been duly tamped, the powder was fired, bringing down no less than 100,000 cubic yards of rock. Granite has been quarried at Baveno, on the Lago Maggiore, in a like manner. In 1886 a monster blast of 17½ tons of gunpowder and half a ton of Nobel's dynamite were exploded simultaneously, displacing 500,000 cubic yards of granite. Twenty or thirty blocks of from 1,000 to 6,500 cubic yards each were carried fully 300 yards by the explosion. A block of 6,500 yards would be represented by a cube of 55 feet on the side.

As will be naturally understood, the task of removing waste rock or earth often lying above the useful mineral increases with the thickness, until at last a point is reached when it will no longer pay to work the quarry open. The quarry-owner then endeavours to devise some method of excavating the valuable material by itself, leaving the waste rock as a roof. This leads him to true underground mining, which from a strictly legal point of view is beyond the scope of my lecture. However, when stone is obtained from such excavations, they are popularly known as quarries, and on this account they deserve a word of mention.

As the material quarried is usually of small intrinsic value, the cheapest method of supporting the roof is to leave portions of the deposit unworked. This method is employed in working slate at Festunio, in Merionethshire. The beds of slate are sometimes more than 120 feet thick, and are worked by chambers separated one from the other by thick partitions of

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rock ; in other words, a huge wall of slate, 30 or 40 feet thick, is left standing between every two chambers of like dimensions. Two or three beds may be worked one above the other, care being taken that the position of the pillars shall coincide. The chambers themselves are huge caverns, the roof of which may be more than 100 feet above the heads of the workmen.

Wales is not the only part of the world where slate is obtained in underground quarries. France and Germany afford examples of similar, or somewhat similar, workings. At the slate quarries near Fumay on the Meuse, and Rimogne, near Mézières-Charleville, the men fill up the chambers with rubbish, and stand upon it while at work.

5. Transport.

A word must be said about the methods of bringing the product of the quarry from the workings to the places where it is made fit for sale.

These methods vary very considerably according to the situation and size of the workings. In some places, as already mentioned, the mineral is loaded in the quarry directly into railway trucks and sent away without any preliminary treatment whatever ; in others it is lowered down the sloping sides of mountains or raised from deep pits. At the celebrated Carrara quarries blocks weighing from ten to forty tons each are lowered in a very primitive fashion down rough inclined planes by means of ropes twisted round posts, which are set up at regular intervals. The usual method is to construct self-acting inclines, the weight of the descending loaded waggons drawing up the empties.

When the quarry is a pit which cannot be tapped by a tunnel, the mineral may be drawn up inclined planes by any available source of power or it may be lifted by a crane or an aerial incline. This latter device is largely used in North Wales and in Scotland, where it is known as the "Blondin." It has the advantage of being easily and cheaply erected and of being capable of picking up the load of mineral at various parts of the bottom of the pit.

6. Preparation of the Mineral for the Market.

As a rule, the mineral coming away from the quarry requires treatment of some kind before it is brought into a condition fit for the purchaser. Considering the variety of substances which are quarried, viz. metallic ores, gems and all kinds of stones, it would be impossible for me in the limits of this lecture even to hurry through all the processes which are in use. The

great subject of "dressing" could not be dealt with properly in less than a dozen lectures. I shall therefore limit myself to mentioning a few of the purely mechanical processes employed in the case of stone.

One important branch of the preparation of stone for the market is the manufacture of "setts" or paving stones. The Scotch workman, sitting down at his work, by dexterous blows of a hammer, which has a slightly concave face, splits the blocks across so as to form the paving stones he requires. The Carnarvonshire man stands and does his work in a bent posture.

The manufacture of road metal is carried on on an enormous scale in the Charnwood Forest district of Leicestershire, and likewise at Penmaenmawr in North Wales. The blocks of stone coming from the quarry are first reduced in size by a stonebreaker, that is to say, a machine with two huge jaws, which crack the stone just as we should a nut with the teeth ; the broken stone then falls between two revolving toothed rolls, the stone is once more cracked and has simply to be passed through sieves in order to be separated into the different sizes required for various trade purposes.

In the case of slate, the blocks coming from the quarry, sometimes weighing a ton or two, are split by wedges into slabs about 3 inches thick, which are sawn across into the lengths required and then skilfully split by thin chisels. The thin sheets are "dressed" into the well-known rectangular shape, either by hand choppers or knives worked mechanically.

THE VENTILATION OF BUILDINGS.

(Concluded from last week.)

THE height of the ventilating shaft is usually determined by the architect, who considers it with reference to the architectural effect in the building. When this is given, we have but to take the square root of the known height of the chimney, multiplied by the square root of 25, which is 5, divide the product by 4 and we have as a result the velocity at which the air will travel in the shaft in feet per second. It only remains to divide the total number of cubic feet to be removed per second by the velocity of the air per second, and the result is the sectional area of the shaft which is sought. Let us take a simple example by way of illustration. Given the height of the shaft, 50 feet, and the amount of air to be furnished

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72,000 cubic feet per hour or 20 feet per second, the formula would work out thus:—

$$\frac{\sqrt{50} \times \sqrt{25}}{4} = \text{Vel. in ft. per sec.} = 9 \text{ ft. } \frac{20}{9} = 2.22 \text{ sq. ft.}$$

the necessary sectional area of the shaft.

If the area of the ventilating shaft is given, the height being left to be determined, it is only necessary to know the amount of air to be removed, the difference between the internal and external temperatures, and to fix upon the velocity at which the air shall travel. The sectional area of the shaft must often be determined by the conveniences of construction, being governed by the plan of the building. A very safe rule is to make the sectional area of the ventilating shaft equal to the combined sectional areas of all the ducts leading into it. It is possible to secure efficient ventilation with a ventilating shaft which is somewhat smaller than this, but this is unquestionably the safest rule to follow. To determine the rate at which the air will travel, it is only necessary to divide the amount of air in cubic feet required per second by the sectional area of the shaft expressed in feet. With these data, the determining of the required height is a very simple problem, using the formula which has already been given. An example will make this entirely clear.

Let us suppose that the conditions are as follows:—Air is required for forty-eight students. At 2,400 cubic feet per hour for each, the total amount needed would be 115,200 cubic feet per hour, or 32 cubic feet per second. The combined area of ducts of sufficient size to allow the transmission of this air at the rate of 5 feet per second would be $32 \div 5 = 6.4$ square feet, and the velocity will, of course, be 5 feet. The question we have to solve is what would be the necessary height of the ventilating shaft to secure this velocity, the difference in temperature being 25 deg. Fahr. The solution of this very practical problem is extremely simple. Bearing in mind the formula, we will let H represent the height of the shaft, D the difference between the internal and external temperatures and V the

velocity of air per second; $\frac{\sqrt{H} \times \sqrt{D}}{4} = V$. Substituting the quantities which are known we have the following:—

$$\frac{\sqrt{H} \times \sqrt{25}}{4} = 5.$$

Reducing, we have $5\sqrt{H} = 20$, $\sqrt{H} = 4$, $H = 16$; that is, the height of the shaft required by the conditions named would be

16 feet. In most instances it is more convenient to employ a smaller shaft and one of greater height. Let us suppose such a case, in which the amount of air required per second is the same, namely, 32 cubic feet per second, and the sectional area of the shaft 4 square feet instead of 6. Dividing the amount of air required per second by the area of the shaft, we have 8 as the velocity per second ($32 \div 4 = 8$). Our formula then would

be as follows, $\frac{\sqrt{H} \times \sqrt{25}}{4} = 8$; reducing we have $5\sqrt{H} = 32$,

$\sqrt{H} = 6.4$, $H = 40.96$. In this case the height of the shaft would be practically 41 feet. By the same method the necessary height of shaft for any given area may be readily determined.

From an economical standpoint, other things being equal, it is far better to secure increased efficiency by increasing the size of the ventilating shaft rather than its height, for the obvious reason that the capacity of a shaft for removal of air increases directly with the increase in sectional area, whereas the velocity of the air current increases in direct ratio with the square roots of the heights of the shaft, thus requiring that the height of a shaft shall be quadrupled to double its efficiency while it is only necessary to double its sectional area to secure double efficiency. There is also a loss by increase of friction and of cooling surface, and in the disproportionate increase of expense of construction. The cost of increasing the efficiency of a shaft 100 per cent, by increasing the velocity of the air current, will be very much greater than in securing the same result by increasing its sectional area. Cases occur, of course, in which the stronger draught secured by increased height of shaft is essential to the efficient working of a ventilating system or the accomplishment of a specific purpose.

8. When possible to do so, it is unquestionably preferable to so plan a system of heating and ventilation that it will operate efficiently by the aid of natural draught only. Such a system is as nearly automatic in its action as any ventilating system can be made. A draught which depends upon a mechanical apparatus, as a pressure or suction fan, or even upon a steam-coil or other form of heating apparatus in the ventilating shaft, is very likely to be found defective when efficiency is most needed. I have visited many large institutions provided with large ventilating fans, and have never yet found one in which the apparatus was in constant operation. In many cases it had been inoperative for years, and was not in running order. In one case I was informed that

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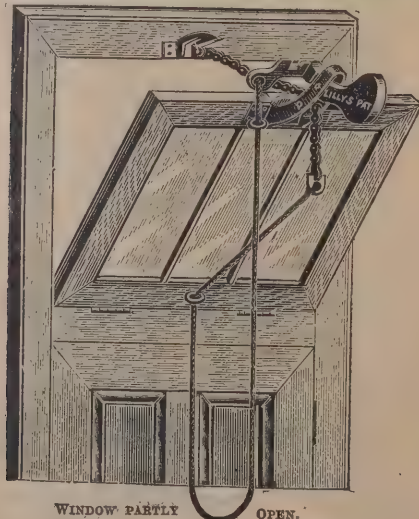
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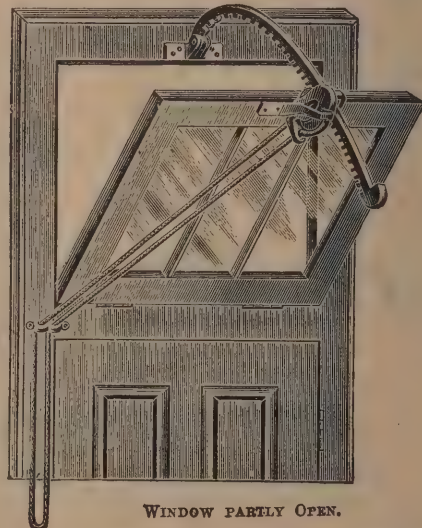
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the fan was started "whenever the odours in the ward became so strong as to be very noticeable." To my nose the odours were at that moment very strongly pronounced, and yet the fan was not in operation. The noses of managers and attendants become accustomed to odours to the presence of which they are constantly exposed, so that they cease to be a proper means of testing the condition of the air.

Some years ago the writer visited a large hospital, the air supply of which was wholly dependent upon a fan which was a pressure-blower, and hence so constructed that when the fan was not in operation the opening for the entrance of air through the fan was very small. The fan was placed in the mouth of a tunnel nearly 8 feet in diameter, just about the proper size for supplying air to the hospital at a moderate velocity, but the opening of the fan had a sectional area of only about 4 square feet. The hospital had been in operation for some three years. The fan had never been in operation since the opening day, as it was run by a separate engine, and was so far from the building as to require the attention of a special engineer when in use, and, consequently, the air-supply of the hospital, which was filled with sick people of all classes, was limited to the small opening described, there being no other. It is certainly unwise to so plan the ventilating system of a large building as to make the inmates absolutely dependent upon the efficient working of a mechanical apparatus of this sort. Mechanical and other means of assisting "natural draught" are, nevertheless, valuable, and in some instances necessary accessories to a system of natural ventilation, especially for large buildings, as they furnish a means by which the disturbing influence of winds may be more or less completely overcome. The writer has had two large fans in use in buildings under his care for several years, as occasion has required. As usually constructed and employed, however, these appliances are almost useless from their inadequacy and inefficiency. This is especially the case when heat in the ventilating shaft is depended upon as a means of securing a strong draught, in consequence of the use of an amount of heating surface quite inadequate for the work required.

Ventilating shafts which are exposed on all sides, and even those which are placed in the outer walls of buildings, must be heated or furnished with a fan to insure a constant draught. The amount of heating surface usually provided in such cases is ridiculously small, and is not infrequently so placed as to be of very little value. When it is recalled that all the air sup-

plied to a building must pass through the ventilating shaft, it will be apparent that a considerable amount of heat must be imparted to this air to produce a strong draught in case the chimney is so situated that the air loses a considerable amount of its heat before it is expelled from the chimney.

From experiments which have been made (Box) for the purpose of determining the heating capacity of steam-pipes, we know that 1 square foot of surface of 1-inch pipe (3 linear feet) will give off about 300 heat units per hour, or 5 heat units per minute under the conditions in which heating is required in a ventilating shaft. Five heat units will raise the temperature of 276 cubic feet of air 1 deg. (1 cubic foot of air at 62 deg. weighs '0761 lbs.). The specific heat of air is '238. $5 \div '0761 \div '238 = 276$. Knowing the amount of air to be transmitted by the ventilating shaft per minute or second, it is easy to determine the amount of heating surface required to raise the temperature of the air one or more degrees. It is only necessary to divide the amount of air transmitted per minute by 276 to determine the number of square feet of heating surface required to raise the temperature of the given quantity of air 1 deg. Fahr.

Taking, for example, a case in which, as in our last illustration, the amount of air required to be transmitted is 32 cubic feet per second, or 1,920 cubic feet of air per minute, we have $1,920 \div 276 = 6.95$, practically 7 square feet of heating-surface, or 21 linear feet of 1-inch pipe, necessary to raise the temperature of the air 1 deg. Fahr. To raise the temperature of the air 5 deg., which would be quite sufficient to insure the successful working of the shaft, would of course require five times as much heating surface, or 105 linear feet of 1-inch pipe.

The most economical method possible for heating a ventilating shaft is the combustion of fuel in the shaft itself. A number of years ago, in studying the ventilation of the Houses of Parliament in London, by the aid of the assistant engineer, who kindly conducted me through the subterranean region of this great structure, I was surprised to find that the current of air in the great towers, which are not merely architectural features but constitute the ventilating shafts of the building, was maintained by means of a great heap of burning coal, which was placed exactly in the centre of the shaft upon a high platform, the top of which was at about the same level as the top of the great horizontal ventilating ducts which entered the shaft at its bottom.

Fuel may be consumed in a shaft by means of a stove placed in a chimney, carrying the stove-pipe up through it. In exceptional cases the smoke may be discharged directly into

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the shaft, but this arrangement is not always a safe one and hence cannot be recommended. The position of the heater is a matter of no small importance. I have sometimes seen a steam-coil placed at the extreme bottom of the ventilating shaft, the first opening being several feet above it. In so placing the heater there is very little circulation of air, and hence its efficient heating-capacity is not utilised. To secure the efficient working of a ventilating shaft, the heater should be placed above the highest opening. It is, as a rule, not wise to have openings into a ventilating shaft at different levels, but if this arrangement cannot be avoided the heater should certainly be placed above the highest opening; or if a long heater, placed against the side of a chimney, it should extend above the highest opening. Whether the heat should be concentrated near the lower portion of the shaft, or should be extended some distance along the inside wall, is a question which may be differently answered according to circumstances. There is an advantage in the extension of the heater some distance along the inner wall, in that a better opportunity is afforded for radiation and thus for heating the inner surface of the shaft, and so preventing the tendency to downward currents. It should be remembered, however, that the higher in the shaft the heater is placed the shorter will be the heated column, and hence, from this standpoint, the less the efficiency of the heat employed.

In conclusion, the writer wishes to disavow any attempt to make in the foregoing an extensive presentation on the subject of ventilation. Those who wish to make an extended study of the subject will find the means of doing so in the excellent work of Mr. Thomas Box, published by E. & F. N. Spon, 12 Cortlandt Street, New York City. My aim in the preparation of this paper has been to present such practical points as I have gathered from a somewhat extended experience in planning the ventilation of large buildings in which I have had an opportunity to live for a series of years, studying the result of various methods employed, and to formulate a few simple rules which are useful for the working-out of correct methods of ventilation in all ordinary cases, and which are much less cumbersome for use than the ponderous formulas of Box and others who have undertaken to present this subject in a scientific way. I ought also, perhaps, to call attention to the fact that, while the physical principles relating to heating, ventilating, &c., are correctly given by Box and other authors who have given much scientific data upon this subject, the suggestions made with reference to the supply of fresh air are,

as a rule, widely at variance with the conclusions at which Parkes, Angus Smith and other investigators have arrived in the study of the question of ventilation from a sanitary and hygienic standpoint, and so are not to be relied upon. For example, Box puts the amount of fresh air required for each person per hour at 212 cubic feet, which is simply ridiculous, being less than one-tenth the amount shown by ample experience to be really necessary.

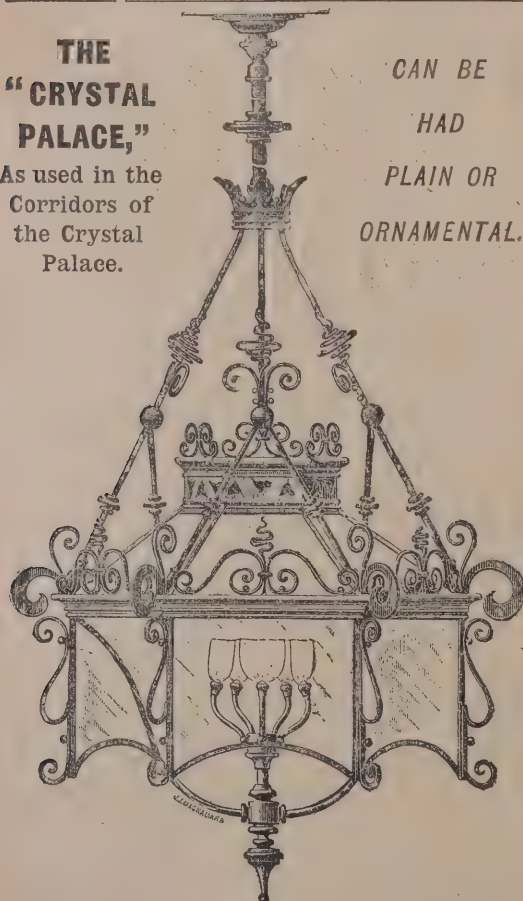
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HALIFAX.—May 11.—For Constructing Reservoir and Laying Earthenware and Cast-iron Pipes. Messrs. Horsfall & Williams, 15 George Street, Halifax.

KENSINGTON.—May 16.—For Enlarging Nurses' Home. Mr. T. W. Aldwinckle, 1 Victoria Street, Westminster.

KNOCKHOLT.—May 15.—For Building Police Station. Mr. F. W. Ruck, 86 Week Street, Maidstone.

LAMBETH.—May 16.—For Erection of a Large Shed with Corrugated Iron Roof. Mr. Henry J. Smith, Vestry Hall, Kennington.

LEWISHAM.—May 10.—For Boring at the Ladywell Baths. Mr. E. H. Oxenham, Local Board Offices, Catford.

LEYBURN.—May 16.—For Building Church Room. Mr. Wm. Bell, N.E.R. Station, Leyburn.

LISCARD.—May 27.—For Excavating and Forming a Lake in Central Park. Mr. A. Salmon, Public Offices, Egremont, Cheshire.

MANCHESTER.—May 13.—For Erection of Electric-light Machinery and Installation. Mr. T. de Courcy Meade, Town Hall, Manchester.

MANCHESTER.—May 16.—For Pointing Chimney-stacks and Walls at Workhouse. Messrs. W. T. Gunson & Son, 10 Marsden Street, Manchester.

MERTHYR-TYDFIL.—May 13.—For Erection of an Accident Ward at Hospital. Messrs. Wakeling & Mackay, Market Square Chambers, Merthyr-Tydfil.

MILE END.—May 23.—For Erection of New Laundry Machinery, New Engines, Steam Plant and General Engineer's Work in Connection with their New Steam Laundry, and Alterations and Additions to the Laundry and Boiler-house, at the Workhouse, all situate in Bancroft Road, London, E. Mr. C. F. Burden, Guardians' Office, Bancroft Road, E.

MOSS SIDE.—May 18.—For Building Board School and Caretaker's House. Messrs. Woodhouse & Willoughby, 100 King Street, Manchester.

MURTON COLLIERY.—May 13.—For Building Twenty Cottages. Mr. Robert Hogg, Fatterly Pasture, Murton Colliery.

RADCLIFFE.—May 15.—For Building School, &c. Mr. Edwin Grundy, 12 Brazenose Street, Manchester.

RAWDON.—May 13.—For Building Chemical Mixing-house and Concrete Precipitation Tanks and Laying Stoneware and Iron Pipe Sewers. Mr. W. H. Radford, Angel Row, Nottingham.

ROCHDALE.—May 10.—For Building Offices for the Guardians. Messrs. Rutworth & Duncan, Architects, South Parade, Rochdale.

RYTON.—May 13.—For Constructing Sewers, with Flushing Chambers, Ventilation Shafts, &c. Mr. J. P. Dalton, Urban District Council Offices, Ryton-on-Tyne.

SCARFSKERRY.—May 15.—For Constructing Concrete Pier. Mr. James Barrow, 166 Union Street, Aberdeen.

SHEFFIELD.—May 11.—For Building Dwelling-house. Mr. C. Hadfield, Old Club Chambers, Norfolk Street, Sheffield.

SPILSBY.—May 15.—For Supply of 7,000 Tons of Broken Granite and a like amount of Broken Slag. Mr. George Walker, Council Offices, Spilsby.

ST. MABYN.—May 11.—For Building Schools. Mr. John J. T. Andrew, St. Mabyn.

ST. MARYLEBONE.—May 16.—For Erection of a Shelter, &c., at the Parish Stoneyard. Mr. W. H. Garbutt, Court House, St. Marylebone.

ST. HELIERS.—May 10.—For Constructing Landing Stage. States Engineer's Office, Jersey.

STOCKPORT.—May 13.—For Constructing Brick Sewers. Mr. A. M. Fowler, 1 St. Peter's Square, Manchester.

SUFFOLK.—May 24.—For Sinking Two Wells, 6 Feet Diameter and about 25 Feet Deep, and Lining them with Cast-iron Cylinders, Putting Down a 6-inch Borehole in each Well to the Depth of 300 Feet from the Surface, Lined with Borehole Tubes, and Providing Temporary Pumping Plant and Proving the Yield of Water from each Borehole, together with all Pipes, Fittings and other Subsidiary Works, and Construction of Aeration and Filtration Works, consisting of Aerating and Subsidising Tank of a capacity of 50,000 Gallons, Three Sand Filter Beds, Covered Sterilised Water-tank of a Capacity of 50,000 Gallons and Sand-washer, together with all necessary Valves, Pipes and Connections. Messrs. Geo. & Fred. W. Hodson, Engineers, Loughborough.

SWINDON.—May 27.—For Erection of a School to accommodate 885 Children. Mr. W. Drew, Architect, Swindon.

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WALSALL.—May 14.—For Providing and Laying Asphalte. Mr. John R. Cooper, Town Clerk, Walsall.

WAR DEPARTMENT.—May 14.—For Painting, White-washing, &c., Internally and Externally Various Barracks and Buildings in Woolwich Royal Engineer District. Lieut.-Col. Orpen, R.E. Office, Woolwich.

WAR DEPARTMENT.—May 31.—For Engineer Station and Out-Station in the North-Western District, Liverpool. Major R. Thompson, R.E., Royal Engineer Office, Rupert Lane Barracks, Liverpool.

WEST HAM.—May 14.—For Two Beam Pumping-Engines, each about 250 Indicated Horse-power; Two Centrifugal Pumps and Engines, each about 350 Indicated Horse-power; Four Boilers, each 30 Feet in Length by 7 Feet 6 Inches in Diameter; also Alterations to Existing Centrifugal Pump, Engine and Boilers and Other Works. Mr. Lewis Angell, Town Hall, Stratford.

WESTMINSTER.—May 10.—For Rebuilding West Block of Workhouse. Messrs. J. Waldram & Son, 13 Buckingham Street, W.C.

WHITECHAPEL.—May.—For Internal Painting and Minor Structural Works at the Infirmary, Mile End Road. Mr. Capel, Union Offices, Baker's Row, E.

WYE.—May 11.—For Constructing Gasholders and Tank. Mr. W. Lewin, the Gas Company, Wye.

YSTRAD RHONDDA.—May 11.—For Building Church and Boundary Walls. Mr. E. M. Bruce Vaughan, Architect, Cardiff.

At the meeting of the Edinburgh Dean of Guild Court, of twenty-six applications seventeen were granted, warrants being issued to the Corporation, to construct a subway and access between Orwell Terrace and West Fountain Place; to Mr. James Anderson to erect a villa at the corner of Mayfield Road and Lygon Road, and to Mr. Alex. Wilson to erect semi-detached villas at Saville Terrace.

TENDERS.

ACTON.

For Erection of new Vestry at All Saints Church, South Acton, W., for the Rev. J. Macarthur, M.A. Mr. EDWARD MONSON, F.R.I.B.A., Architect, Acton Vale, W.
 Chamberlen Bros., Hammersmith . . . £825 0 0
 G. Hooper, Acton . . . 735 0 0
 J. Christie, Shepherd's Bush . . . 731 0 0
 G. Lyford, Shepherd's Bush . . . 730 0 0
 T. Nye, Ealing . . . 685 0 0
 J. DOREY & CO., Brentford (accepted) . . . 649 0 0

For Rebuilding of No. 16 Church Road, Acton, W., for Mr. F. A. Everitt. Mr. EDWARD MONSON, F.R.I.B.A., Architect, Acton Vale, W.
 G. HOOPER, Acton (accepted) . . . £770 0 0

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For Building Warehouse, Far Fold, Armley, for Mr. Councillor Gaunt. Mr. F. W. RHODES, Architect, Upper Wortley.
Accepted Tenders.
 W. W. Haley, Bramley, bricklayer and mason . . . £247 0 0
 A. Knapton, Wortley, carpenter and joiner . . . 112 0 0
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For Alterations to House, Walton Street, for Mr. G. Lepper. Mr. J. T. LAWRENCE, Architect, Leighton Buzzard.
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For Building Semi-detached Villas at Upper Bangor, for Dr. Lloyd and Captain Davies. Mr. RICHARD DAVIES, Architect.
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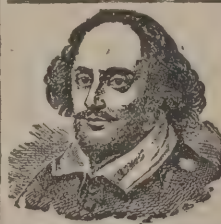
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Jones & Williams, Bangor	1,618 0 0
W. JONES, Bangor (accepted)	1,489 0 0
For Building Pair of Residences at Upper Bangor, for Mr. Charles Pozzi. Mr. RICHARD DAVIES, Architect.	
R. & J. Williams, Upper Bangor	£1,857 0 0
W. & O. Pritchard, Llanfair	1,778 0 0
Jones & Williams, Bangor	1,658 0 0
W. Jones, Bangor	1,589 0 0
E. WILLIAMS, Bangor (accepted)	1,465 0 0

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For Building Girls' School, Cookery School and Caretaker's Residence, Romilly Road, Barry, for the Barry United District School Board. Mr. GEORGE THOMAS, F.S.I., Architect, Cardiff.	
H. J. Money, Barry	£7,065 0 0
F. Small, Barry	6,538 0 0
Henry Davies, Cardiff	6,532 0 0
D. C. Jones & Co., Gloucester	6,435 0 0
Lloyd & Tape, Barry Dock	6,275 0 0
E. R. Evans & Bros., Cardiff	5,959 0 0
D. Davies, Cardiff	5,770 0 0
G. RUTTER, Barry (accepted)	5,395 0 0
Architect's estimate	5,444 0 0

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For New Laundry at the Workhouse, for the Guardians. Mr. HERBERT WALKER, Architect, Newcastle Chambers, Nottingham.	
G. Hopewell & Son, Basford	£2,332 5 10
J. Dove, Hucknall Torkard	2,210 0 0
Dennett & Williamson, Nottingham	2,163 0 0
J. Attenborough, Nottingham	2,068 0 0
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J. F. Price, Nottingham	2,025 0 0
Hodson & Son, Nottingham	2,025 0 0
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J. Shaw, Nottingham	1,940 0 0
W. PINKETT, Bulwell (accepted)	1,709 0 0

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For Building House and Shop at Bethesda, for Mr. Owen Jones, Victoria House. Mr. RICHARD DAVIES, Architect, Bangor.	
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W. ROBERTS, Bethesda (accepted)	544 0 0

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W. BAIRD, Dublin (*accepted*) 1,163 3 4

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For Rebuilding Premises, Mitre Street, Colchester, recently destroyed by fire, for Mr. Robert Howe. Mr. G. H. PAGE, Architect, Trinity Chambers, Colchester.

G. Bowles, Colchester £1,370 0 0
G. Dobson, Colchester 1,197 0 0
G. Farran, Colchester 1,145 0 0
A. Chambers, Colchester 1,045 0 0
F. DUPONT, Colchester (*accepted*) 984 0 0

CROWBOROUGH.

For Building Public-house, the Rose and Crown, for Messrs. Ballard & Co. Mr. H. CURTIS CARD, F.S.I., Architect, Lewes.

W. Wells, Lewes £1,167 0 0
Wickens & Son, Crowborough 1,162 0 0
D. WICKENS, Crowborough (*accepted*) 1,018 0 0
Pockham, Uckfield (*withdrawn*) 800 0 0

DEVONPORT.

For Alterations to Front of the Royal Sailors' Home, Duke Street, Devonport. Mr. H. G. LUFF, A.R.I.B.A., Architect, 64 Chapel Street, Devonport.

G. H. Smith & Son, Devonport £342 15 0
W. Littleton, Devonport 339 10 0
J. HEALY & SON, Devonport (*accepted*) 333 0 0

DOVER.

For Construction of Vale View Road, for the Town Council.

A. Matthews, Dover £184 16 11
H. Stiff, Dover 155 0 0
AUSTEN & LEWIS, Dover (*accepted*) 151 7 0

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For Building Eight Dwelling-houses, off Atherton Street, for the Durham Co-operative Society, Limited. Mr. H. HENRY, Architect, 11 North Bailey, Durham.

Accepted Tenders.

J. G. Bradley, mason £853 0 0
W. Walton, joiner 579 15 0
T. Nesbitt, plasterer 138 0 0
W. T. Blakey, slater 102 15 0
N. W. Almond, plumber 94 0 0
T. H. Dodd, painter 42 16 10

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For Building a Crown Post Office, East Grinstead, for the Commissioners of H.M. Works and Public Buildings.

C. Rice	£3,155 7 4	A	£15 7 4
H. Young	3,100 0 0		20 0 0
W. Marriage & Co.	2,800 0 0		20 0 0
J. Morris	2,690 0 0		20 0 0
Battley, Son & Holness	2,639 0 0		50 0 0
E. Steer	2,552 18 7		25 0 0
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P. Peters	2,350 0 0		10 0 0
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R. Gilchrist & Son	2,122	8	0
J. Paterson & Son	2,118	4	6
Bell, Hornsby & Co.	1,962	5	6
R. C. Brebner	1,954	0	6
W. Simpson, jun.	1,899	9	10
J. Drysdale	1,879	5	6
G. Duncan	1,844	2	0
D. Murray	1,750	2	0
J. Watson	1,741	19	6
W. Eadie	1,682	5	0
T. Black & Co.	1,638	11	0
A. Thomson	1,633	16	6
A. & J. FALL (accepted)	1,625	3	2

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For Additions to Public School, Inverurie. Messrs. ELLIS & WILSON, Architects, 181A Union Street, Aberdeen.

Accepted Tenders.

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J. Milne, carpenter	456	10	0
Sivewright, plasterer	99	11	0
J. Laing & Son, plumber	92	19	0
W. Milne, slater	70	0	0
J. Godsman, painter	22	6	9

KENLEY.

For Building Police Station at Kenley, for the Receiver for the Metropolitan Police District. Mr. JOHN BUTLER, Architect. Quantities by Mr. W. H. THURGOOD.

Graham	£4,200	0	0
Grover	4,097	0	0
Higgs & Hill	3,984	0	0
Lathey	3,950	0	0
Smith	3,950	0	0
Holloway Bros.	3,885	0	0
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GOULD, Hunslet: (accepted) . . . about £21,000 0 0

LLANRWST.

For Building House and Shop at Llanrwst, North Wales, for Messrs. Williams, Gwydyr House. Mr. RICHARD DAVIES, Architect, Bangor.

E. Jones, Bettws-y-coed	£1,400	0	0
J. Jones, Pentre Voelas	1,370	0	0
H. HUGHES, Llanrwst (accepted)	1,338	0	0

LEWES.

For Enlargement of Board Room, for the Guardians. Mr. W. A. MOLE, Surveyor, Albion Street, Lewes.

F. Piper	£78	10	0
H. Card & Son	54	10	0
J. Floyd	45	10	0
W. WELLS (accepted)	42	0	0

For Construction of Sewer, with Manholes, Lampholes, &c., Southover, for the Town Council.

P. Peters, Horsham	£2,046	9	1
T. Adams, Wood Green	1,883	14	10
M. S. Kitteringham, Enfield	1,878	12	8
W. H. SAUNDERS & Co., Bournemouth (accepted)	1,680	9	8

LONDON.

For Extension of Nursing Home at London Hospital, Whitechapel, E. Mr. ROWLAND PLUMBE, Architect.

John Yates	£15,841	5	6
L. Whitehead & Co.	13,650	0	0
L. H. & R. Roberts	13,635	0	0
T. Rider & Son	13,609	0	0
W. Goodman	13,333	0	0
Howell J. Williams	13,275	0	0
E. Lawrence & Son	13,195	0	0
Perry & Co.	13,166	0	0
Holloway Bros.	12,985	0	0
W. Shepherd	12,885	0	0

For Work required in connection with Chimney Stacks, Roof, &c., at the St. Pancras Infirmary, Dartmouth Park Hill, N. J. A. DIXON, Highgate (accepted) . . . £166 10 0



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LONDON—continued.

For Repairs, Drainage, Improved Sanitary and other Works at St. George's Union Workhouse and Infirmary. Mr. H. SAXON SNELL, F.R.I.B.A., Architect, London.		
Leslie & Co., Kensington Square	£4,719	0 0
R. M. Heywood, Hammersmith	4,490	0 0
Geo. Foxley, King Street, W.	4,300	0 0
W. Pearce, Grayton Road, N.W.	4,246	0 0
Mowlem & Co., Westminster	4,200	0 0
W. Lidstone, Blackstock Road, N.	4,193	0 0
H. WALL & Co., Kentish Town (accepted)	3,897	0 0

NOTTINGHAM.

For Pulling Down Old Buildings and Rebuilding the Bowling Green Inn, Canal Street, Nottingham. Mr. W. B. STARR, Architect, 12 St. Peter's Gate, Nottingham.		
F. Wartnerby	£2,784	0 0
W. Savidge	2,750	0 0
F. Messom	2,725	0 0
J. G. Thomas	2,725	0 0
T. Cuthbert	2,703	10 10
Scott & Son	2,697	0 0
J. F. Price	2,680	0 0
W. Maule	2,680	0 0
R. Fisher	2,649	10 0
J. Dove	2,605	0 0
A. G. Bell	2,599	0 0
H. Vickers	2,585	0 0
J. Oscroft	2,584	10 0
G. A. Pillatt	2,575	0 0
G. T. Lovett	2,573	0 0
J. WHEATLEY (accepted)	2,537	15 0
For Building Thirteen Cottages at Hyson Green, Nottingham. Mr. W. B. STARR, Architect.		
Clay & Cartledge, Hucknall Torkard	£2,167	0 0
H. Moore	2,145	0 0
T. Cuthbert	1,985	0 0
R. Howitt	1,926	0 0
J. Cooper	1,911	0 0
F. Wartnerby	1,894	0 0
SCOTT & SON (accepted)	1,849	0 0

PLYMOUTH.

For Street Works, for the Corporation. Mr. J. PATON
Borough Surveyor.

Ebrington Street.

Paynter & Davey	£742	3 6
J. Shaddock	739	8 6
W. C. Shaddock	630	4 3
E. Duke	604	1 3
C. L. Duke	558	9 6
T. SHADDOCK (accepted)	539	18 6

Drake Street.

Paynter & Davey	300	9 10
E. Duke	251	1 6
J. Shaddock	245	14 0
T. Shaddock	245	1 6
J. Welsh, Bath	230	12 9
W. C. Shaddock	225	4 0
C. DUKE (accepted)	210	14 5

Charles Place Lane Sewer.

J. Shaddock	248	11 6
W. C. Shaddock	239	10 6
Paynter & Davey	222	5 6
E. Duke	213	10 0
C. Duke	212	7 0
T. SHADDOCK (accepted)	208	18 4

READING.

For Works, for the Berkshire County Council:—(1) Maidenhead, Repair and Partial Rebuilding of Chapel Arches;
(2) West Hendred, Partial Rebuilding of Lud Bridge;
(3) New Bridge at Tidmarsh. Mr. J. MORRIS, Bridge Surveyor, 156 Friar Street, Reading.

Contract No. 1.

Martin, Maidenhead	£370	0 0
Partlo, Maidenhead	287	0 0
G. & C. Allen, Reading	254	0 0
H. HILL, Maidenhead (accepted)	224	0 0

Contract No. 2.

G. & C. ALLEN (accepted)	93	10 0
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Contract No. 3.

ELLIS, Reading, steelwork (accepted)	129	12 4
BOXALL & SON, Pangbourne, builders (accepted)	58	10 0

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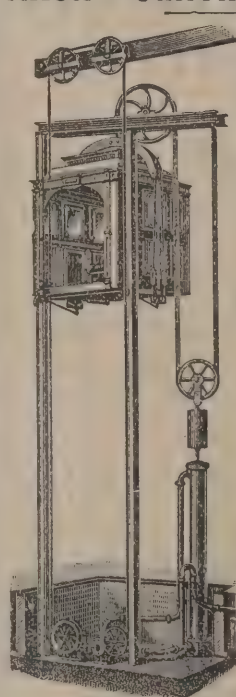
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For Bakehouse in Rawtenstall. Mr. G. NIGHTINGALE, Architect.
MOORE BROS. (accepted) £591 18 8

RODBOURNE CHENEY.

For Building Infants' School, and Alterations to Haydon School, for the Rodbourne Cheney School Board. Mr. WILLIAM DREW, M.S.A., Architect, 22 Victoria Street, Swindon.
W. Gerring, Swindon £845 10 0
H. Flewelling, Wootton Bassett 735 0 0
C. Williams, Swindon 724 17 0
W. CHAMBERS, Swindon (accepted) 615 0 0

ROWHEDGE.

For Erection of Buildings on the Lion and Field Estate, Rowhedge. Mr. G. H. PAGE, Architect, Trinity Chambers, Colchester.
J. Warricker £420 0 0
F. Dupont 365 0 0
G. Blaice 359 10 0
G. Rackham 358 0 0
A. Diss 350 0 0

RUSHDEN.

For New Shoe Factory, Station Road, Rushden, for Mr. H. Perkins. Mr. HERBERT ADNITT, Architect, Harborough Road, Rushden. Quantities by Architect.
H. Sparrow, Rushden £1,080 0 0
Whittington & Co., Rushden 1,079 0 0
C. Bayes & Son, Rushden 1,075 0 0
T. Wilmott, jun., Rushden 1,054 0 0
T. & C. Berrill, Irchester 1,047 0 0
R. Marriott, Rushden 1,025 0 0
W. T. Whitbread, Northampton 1,022 0 0
HACKSLEY BROS., Wellingborough (accepted) 997 0 0

SWANLEY.

For Repairs to Properties at Moulton Hill, Swanley, Kent. Mr. ST. PIERRE HARRIS, Architect and Surveyor, 8 Ironmonger Lane, E.C., and Orpington.
C. Catlett, Belvedere £175 0 0
R. A. Lowe, Chislehurst 170 0 0
Somerford & Son, Orpington 157 0 0
Stebbings & Paunett, Sidcup 150 0 0
J. WARD, Swanley (accepted) 127 0 0

SEVENOAKS.

For Levelling, Metalling, Kerbing, Gravelling, Channelling and Making Good of the Bradbourne Park Road, and the Laying of Stoneware Pipe Sewers, with Manholes, Lamp-holes, Gullies and other Works connected therewith, for the Urban District Council. Mr. JABEZ MANN, Surveyor.
E. Iles, Wimbledon £2,199 0 0
S. Hudson, Streatham Hill* 2,072 0 0
* The tender of Mr. Hudson was accepted according to schedule prices.

ST. GEORGE.

For Building Classrooms at Whitehall School, for the St. George's School Board.
F. Martin £1,527 3 1
H. A. Forse 1,490 0 0
W. J. Tanner 1,445 0 0
G. H. Wilkins 1,384 0 0
C. A. Hayes 1,374 0 0
G. Humphries 1,370 0 0
J. Browning 1,340 0 0
G. Downs 1,295 0 0
S. Williams 1,280 0 0
LOVE & WAIT, Bristol (accepted) 1,200 0 0

ST. MARY CRAY.

For Erection of Shop in High Street, St. Mary Cray. Mr. ST. PIERRE HARRIS, Architect, 8 Ironmonger Lane, E.C., and Orpington.
W. R. Taylor, Orpington £308 0 0
Somerford & Son, Orpington 279 0 0
R. A. Lowe, Chislehurst 259 0 0
F. Duthoit, Bromley 255 0 0
T. KNIGHT, Sidcup (accepted) 239 0 0

SOUTHAMPTON.

For Building Grammar School, for the Governors of the Endowed Schools. Messrs. MITCHELL, SON & GUTTERIDGE, Architects, Southampton.
PLAYFAIR & TOOLE (accepted) £5,960 0 0

SWINDON.

For Additions to Eagle Tavern, Regent Street, New Swindon, for Mr. H. W. Thomas. Mr. WILLIAM DREW, Architect, Swindon.
C. WILLIAMS, New Swindon (accepted) £860 17 0

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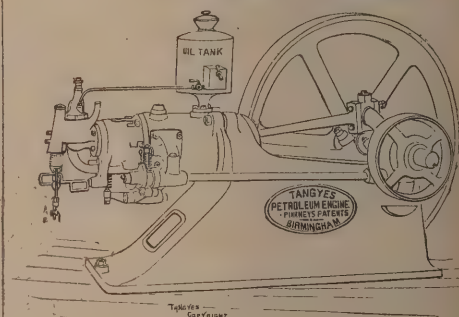
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Boys' Wing.

Stephens & Son, Exeter	£3,806	0	0
W. Gibson, Exeter	3,670	0	0
A. R. Lethbridge & Son, Plymouth	3,560	0	0
J. L. & H. Steer, Clyst St. George	3,555	0	0
E. Andrews, Teignmouth	3,554	0	0
H. P. Rabbich, Paignton	3,480	0	0
M. Bridgman, Paignton	3,474	10	10
Goad & Co., Plymouth	3,464	0	0
Wakeham Bros., Plymouth	3,336	4	4
Tree & Bolley, Exeter	3,289	3	6

Girls' Wing.

A. R. Lethbridge & Son	3,865	0	0
Goad & Co.	3,728	0	0
Stephens & Son	3,570	0	0
W. Gibson	3,540	0	0
E. Andrews	3,400	0	0
J. L. & H. Steer	3,356	0	0
M. Bridgman	3,322	2	8
Wakeham Bros.	3,155	17	4
H. P. Rabbich	3,100	0	0
Tree & Bolley	3,093	9	0

SUTTON-IN-THE-MARSH (Lincs.).

For Contract No. 1, the Construction of a Filtering Tank at the Sewage Outfall and Laying about 200 Feet of 9-inch Pipe Sewer in the Parish of Sutton-in-the-Marsh; Contract No. 2, Laying-out and Levelling Sewage Disposal Grounds, Erection of Engine-house and other Works, and Erection of a Steam-engine and Centrifugal Pump, and Connecting Same to Existing Tank, in the Parish of Burgh-in-the-Marsh, for the Spilsby Rural District Council. Mr. J. E. BUTCHER, District Surveyor, Spilsby.

Contract No. 1.

J. T. TURNER, Wainfleet, All Saints (accepted)	£78	17	0
T. Elms, Wainfleet, All Saints	74	10	0

Contract No. 2.

S. Sherwin, Boston	497	0	0
T. Elms	464	14	0
J. T. Turner	443	15	0
WAITE & SIVIL, Burgh (accepted)	408	0	0

WALTHAMSTOW.

For Erection of a Pair of Villas in Elmsdale Road. Mr. JASPER J. KELE, Architect, 26 High Street, Walthamstow.
Morrison & Goodwin, Southgate Road £950 0 0
Thompson, Leyton 817 0 0
Lawrence, Waltham Abbey 667 10 0
Dartnall Bros., Leytonstone 667 0 0
RAWLINS & TURNER, Walthamstow (accepted) 650 0 0

TRADE NOTES.

THE Eagle Foundry, Greenock, have secured a contract for the construction of a set of triple-expansion engines for a cargo steamer of about 8,000 tons capacity, to be built by Messrs. Russell & Co., Port Glasgow.

THE gas committee of the Bridgnorth Town Council submitted a recommendation at the quarterly meeting, which was approved, that more storage accommodation was an absolute necessity. The engineer recommended that the present large holder, having a capacity of 50,000 cubic feet, be superseded by a two-lift holder of 115,000 cubic feet capacity. There should be no delay in placing the contract, which would absorb a sum of about 1,800l.

AT the finance committee of the Liverpool Corporation there was read a letter from the churchwardens on the prompt and effective action of the City Council in connection with the maintenance, &c., of the church clocks. The report of the surveyor on this subject was approved, and he was instructed to carry out the necessary repairs to the clocks, and to arrange for the winding and keeping in order of the clocks. Evidently in the matter of clocks Liverpool is behind the age.

THE East Finchley Board Schools are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

BUILDING AND BUILDERS.

THE fund for the restoration of Walsall Hospital has reached 2,222l, and the committee have adopted plans for the rebuilding of the damaged portions of it and the addition of a medical ward, the capacity of which will depend upon the amount of money received.

A MEETING of master builders representing associations from the principal towns of Scotland has been held in Edinburgh, for the purpose of considering the advisableness of

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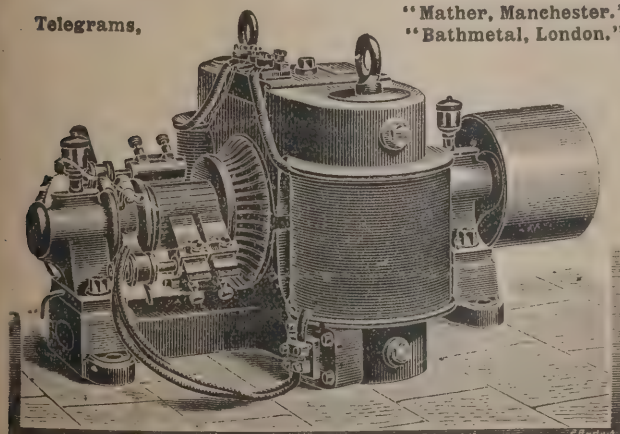
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forming a Scottish federation of the building trades. The proposal to form a federation was agreed to, and a committee was appointed to draft articles of association.

THE Glasgow Police Board by a large majority have adopted the recommendation of the finance committee to sell a plot of ground in Townmill Road at the restricted price of 5s. per square yard to the City Improvement Trustees for the proposed purpose of erecting workmen's dwellings.

BUILDING operations for a new church at Southport will shortly commence under the superintendence of Messrs. Preston & Vaughan, of Manchester, whose designs were selected in competition. The total cost is estimated at about 20,000l.

ELECTRICAL.

At the meeting of the Worcester City Council it was determined by a majority of two to reduce the salary of the city engineer, Mr. T. Caink, from 450l. a year to 400l. a year, in consequence of the appointment of an electrical engineer, who will relieve Mr. Caink of certain duties in connection with the installation of the electric light in the city.

Harper's Weekly for April 20 gives an account of a new electric railway which is about to open in Chicago. It has a capital of 2,400,000l.; a total length completed, including branches, of 13½ miles; on the main line there are four lines of rails, the continuing and subsiding lines having two lines or "tracks"; the trains are to run at "express" speed, 15 miles an hour; and trains will be run at half-minute intervals. The Chicago River is crossed by "two double-track rolling-lift bridges, which can be opened or closed in 15 seconds," two bridges being used, so as not to delay the traffic in case there should be an accident to one of them. The plan adopted is that of the Liverpool electric overhead line, which is run on the trolley system, with a third rail instead of the usual wire overhead. The "power-house," where the electric motive power is generated, contains "four Aldis engines, two of 1,500 horse-power and two of 3,100 horse-power, together with four generators, two of 670 kilowatts and two of 1,370 kilowatts. A kilowatt represents 1,000 watts, a watt

being the practical unit of electrical activity or power. As there are 746 watts in one horse-power, these generators are by the ordinary method of measurement respectively 898 horse-power and 1,836 horse-power. The road has been constructed in the most substantial manner, and is built entirely of basic open-hearth steel. The material was forged and fashioned by the Carnegie Steel Company of Pittsburg, and that company also erected the structure. The passenger cars were built by the Pullman Car Company, and are similar to those used on the elevated roads of New York. The motor cars, built by the Barney Smith Company, are as large as the passenger cars, and are to be used as smokers. The immediate construction of the road has been under the supervision of E. W. Ekert, general manager and chief engineer." A remarkable feature of the enterprise is that the company has not asked for any concessions from the municipal authorities, excepting permission to cross certain thoroughfares. All the land required has been bought privately, at a cost of about 1,400,000l.; an expenditure due to the fact that the line runs for some distance over the principal business part of Chicago, generally through a well-built district. "Six and a half million dollars," says *Harper's*, "for a right of way seems a very steep price, but it really is not so when it is considered that most of the land has been acquired in fee-simple, and that much of it was very highly improved. Some of the structures on the land purchased were handsome apartment houses, costly and quite new. It seemed out of the question to pull these down, so sites were purchased for them, and they were moved off to new locations. One of these, the Normandy flats, was the largest stone house ever moved from its original foundations, and this was taken to another street, several hundred yards away, without any of its walls being in the least cracked or damaged. All of the houses worth moving were so carried off, and the others were demolished."

A NEW and well-written series of articles entitled "Practical Telephony" is now appearing weekly in the columns of our penny contemporary *Electricity*. It is being written by Messrs. James Bell, A.I.E.E., and S. Wilson, and should interest a very large number of readers, especially in view of the inquiry now being held by the Government.

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PREMISES, WEST STREET, FINSBURY.

STAIRCASE LANDING: JUNIOR CONSTITUTIONAL CLUB, PICCADILLY.

VARIETIES.

WE must not always expect to find accuracy in the descriptions of building construction in the newspapers. But the errors may sometimes give rise to much injustice. In the account of the late fire at a biscuit factory at Limehouse it was stated that the building was constructed on fireproof principles. That would mean that iron or steel beams and concrete were employed. But the fact was that the strongest fire-resisting material on the premises was timber; the floors were carried on wood joists, and it is no wonder they succumbed. As injury might be done to a most important industry we have considered it our duty to state the facts, and we repeat that the Limehouse fire is no evidence against the advantages of a system of fireproof construction.

THE Improvement Committee of the Longton Town Council have received the sanction of the Local Government Board to the borrowing of 8,000*l.* for the purchase of land for the purposes of street improvement in Market Street.

THE Argyll County Council has resolved to apply to the Secretary for Scotland for a grant in aid of the construction of roads in the more necessitous districts of the county. It was also agreed to proceed with the construction of the proposed pier at Craignish, for which a Government grant of 1,000*l.* has been promised.

IT is proposed to construct a light railway through the Fylde district, a great portion of which is six miles distant from any railway station. A committee has been appointed to consider the project.

THE death is announced of Sir George Buchanan, for long the chief medical officer to the Local Government Board.

AT the quarterly meeting of the Hereford Town Council it was decided to obtain a loan of 2,456*l.* to repair the breakages in the water mains caused by the late frost.

THE Great North of Scotland Railway Bill, asking running powers over the Highland Railway from Elgin to Inverness, is expected to be taken by the parliamentary committee towards the end of the present week.

AT the monthly meeting of the lower ward committee of the Lanarkshire County Council a statement of the expenditure for the year in connection with the highways and public health was submitted. It showed that for 1894-5 there was expended on highways 9,387*l.* 19*s.* 1*d.*, as compared with 11,642*l.* 10*s.* 10*d.* in the previous year, and on public health 2,891*l.* 17*s.* 3*d.* last year, as compared with 2,708*l.* 11*s.* in the previous year. The capital expenditure was 6,259*l.* 7*s.* last year, as compared with 4,209*l.* 15*s.* 11*d.* in the preceding year.

THE Secretaryship of Her Majesty's Office of Works and Public Buildings is about to become vacant by the promotion of Mr. Primrose.

AT the monthly meeting of the Darwen Town Council Mr. Duxbury, chairman of the water committee, announced a loss of 379*l.* 11*s.* 5*d.* on the working of the department during the year. Mr. Eccles reported upon the progress of the reconstruction scheme. He said that they had over-expended their borrowing powers by 6,000*l.*, and the committee proposed to ask the Council to sanction borrowing powers for 8,000*l.* additional. They intended at some time to erect fifty artisans' dwellings at a cost of 12,000*l.* Councillor Davies said that there was a net profit on the year's working of the gas department of 3,729*l.* 15*s.* 7*d.* He intimated that there would be an early reduction in the price of gas.

THE Surveyors' Institution meet on Monday, the 13th inst., when a paper will be read by Mr. R. E. Middleton, entitled "Village Water Supplies." The annual dinner of the Institution will take place at the Holborn Restaurant (Venetian Room) on Monday, May 27, at half-past six o'clock.

M. EUGENE BELLANGE, painter of the Third Empire, and son of a more eminent artist, died on Tuesday. He was born at Rouen in 1835.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

AT the ordinary meeting on May 2, Mr. Walter Beer, C.E., read a paper on "The Construction of Railway Bridges under 100 Feet Span." He advocated the working out of a set of standard girders for spans starting from 15 feet to the limit previously mentioned, advancing by increments of 5 feet, as he

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believed that the present weight of locomotives and rolling stock had reached the extreme limit. He entered into the methods of calculating the strength of the various parts of girders, and drew attention to the necessity for care in the arrangement of the parts, so as not only to give ample strength to them, but to allow of their easy construction and of accessibility to all the parts for the purpose of painting. The author also gave examples and particulars of the cross girders as well as of the main, and pointed out the necessity of properly bedding the girders on their abutments, and the effect of placing the girders at an angle with the plates on which they rested.

A good discussion followed the paper, and among those who took part therein were the following:—C. T. Walrond, A. W. Ackermann, E. H. G. Brewster, W. Cooper Penn, J. Nealor Cooper, H. Williams, John W. Kitchin, Harold Cooper and A. F. Barnham.

THE WORKS DEPARTMENT OF THE COUNTY COUNCIL.

IN reply to the statement of the manager of the Works Department of the London County Council contained in a report of the Works Committee, the architect of the Council has drawn up a reply. Mr Blashell contends he has only been obeying the express wishes of the Council in insisting upon the best quality of works and materials in the undertakings carried out for the Council. The manager cannot, he thinks, have been officially aware of the excessive pressure which was in the earlier days of the Council put upon the architect's department to exact the best quality of materials and workmanship from every one over whom the architect had influence. All the specifications had to be prepared with a view to the work being carried out, if necessary, by contractors, and had to be written in the language ordinarily used where thoroughly good work was needed. It therefore followed that when these specifications were put into the hands of the Works Department they were expected to carry out the work on similar lines. The architect sees no reason for differing from the statement as to the relations between the workmen and the members of the committee, but is of opinion that more importance might have been attached to the circumstances under which the department was hastily called into being. Much of its earlier work was necessarily experimental; therefore it was a mistake to entrust the whole of the business to them.

PROTECTION FROM FIRE.

SOME remarkable experiments have been carried out at the Germiston Works of the Arrol's Bridge and Roof Company, Limited, Glasgow. The Boyd-Wilson's patent fire-resisting floors and plaster partitions, and also the ordinary concrete and coke-breeze concrete fireproof flooring, were put to some extraordinary tests, and went through the ordeal by fire, water, and crushing pressure successfully. Experts, and among them architects and engineers and others distinguished by connection with and knowledge of building and engineering matters, were present, but of the description of the several tests now before us we may quote two or three which will be quite sufficient to give our readers information.

First, as to Wilson's patent fire-resisting floors, &c. A portion of a section representing a finished warehouse floor of 6-inch rough concrete, and 1½-inch granite finish, was placed on a furnace with the blast turned full on for one hour and ten minutes, over a heat sufficient to consume and burn away malleable iron, and throughout this test the upper surface remained cool. The flooring was then removed, the under side turned up, and instantly, while in that heated state, was thoroughly drenched with cold water. There was not the slightest sign of flying or disintegration of any kind. About three-eighths of an inch only of the under side was affected by the water, and this in a short time hardened up again. The slab, which measured 30 inches by 9 inches by 7½ inches, was then placed on bearings 2 feet 6 inches apart, and broke when subjected to a centre load of 4,060 lbs., and was crushed at a pressure of 1,500 lbs. per square inch.

Secondly, as ordinary concrete. A sample of the very best made ordinary concrete fireproof flooring, measuring 30 inches by 26 inches by 7 inches, composed of four parts of broken bricks, one part of sand, and one part of Portland cement, was tested for strength on bearings 2 feet apart, with a centre load of only 37 cwts. It was thereafter placed on the furnace, and the full blast allowed to act upon it for thirty-seven minutes, when small particles of water were seen being forced through and condensed on the top surface, thus showing that the heat was quickly penetrating the entire mass. It was submitted to exactly the same tests as Boyd-Wilson's patent flooring, but with very different results. It did not fly or disintegrate, but when subjected to the comparatively light weight of 25 cwts. in the centre it broke instantly, and it was perceived that the



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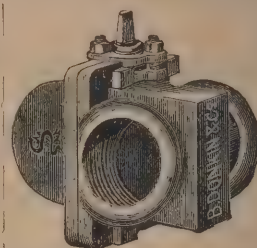
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heat had penetrated to within 2 inches of the top surface. The top was also found to be hot at this stage.

Thirdly, as coke-breeze concrete flooring. A similar test was applied to the coke-breeze or char concrete. The portion in this case submitted to the furnace measured 30 inches by 26 inches by 8 inches, and was composed of four parts of the best char or coke, as used in smith-work, and one part of Portland cement, with finished coat on top, composed of two parts

MARINE HOTEL, BEXHILL-ON-SEA.

ON the 27th ult. that rapidly rising seaside resort Bexhill-on-Sea was *en fête* on the occasion of the visit of the Lord Mayor and the opening of the new Marine Hotel, a commodious, hostelry conspicuously and pleasantly situated on the sea front. It is a stone building, and, as the illustration shows, of attractive elevation, erected by Mr. Cole, succeeded by Mr. Webb, from



crushed granite and one part Portland cement, and skimmed on the under side with neat Portland cement. It was submitted to the full blast of a similar heat for twenty-eight minutes, during which time tiny jets of smoke were seen to issue through the top coating, showing that the mass was rapidly being reduced to a red heat. When it was removed from the fire the under surface was a glowing red mass. It was not fused or vitrified in any way, but it was seen to be red-hot to a considerable depth. After the water test a centre load of 25 cwts. was applied, when it instantly gave way. The upper surface was found to be hot.

designs by Mr. J. B. Wall, architect, of Bexhill. Its interior arrangement leaves nothing to desire; it contains some forty bright, cheerful bedrooms, capable of accommodating about fifty guests, the spacious public rooms are handsomely appointed, and the whole was furnished in admirable taste by Messrs. Oetzmann & Co.

A CHURCH, to be called St. Margaret's, is about to be built in Abel Street, a rapidly growing district of Burnley. It will seat 560 people, and the estimated cost is 5,000l.

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SOCIETY OF ENGINEERS.

A MEETING of the Society of Engineers was held on Monday evening, Mr. Wm. George Peirce, president, in the chair, when a paper was read by Mr. Charles Mason, surveyor to the Vestry of St. Martin-in-the-Fields, Westminster, on

Street Subways for Large Towns.

Mr. Mason said: The importance of an improved method of underground subway construction, although an old subject for casual discussions, has, the author believes, never been brought in a practical manner before a body of engineers. Although many reports have been prepared by municipal engineers, evidence given and Parliamentary powers obtained for the construction of subways for the reception of mains beneath the streets of our large towns, little has been done, and the subject is still one that should have the serious consideration of the engineers to our public authorities, gas, water, electric light and other companies.

Necessity for Subways.—The old-fashioned method of laying underground pipes is such that a periodical inspection of the mains for ascertaining their condition or for stopping leakages is almost impossible. Especially is this the case with our gas and electric mains, and the recent explosions in several parts of the Metropolis have imposed a duty upon those having the control of our streets to devise some better system, whereby material laid under ground of whatever nature can be easily examined from time to time. The construction of subways is the most satisfactory and in fact the only method for laying pipes and mains so that these conditions can be complied with.

The necessity for subways is also brought daily to our notice by the ruthless manner in which the street pavements are continually being disturbed in order to lay new mains, repair leakages, and for other purposes that are necessarily of almost daily occurrence. For those responsible for the maintenance of the pavements nothing can be more disheartening than, after having spent a large amount of time, energy, thought and money in designing and executing as far as possible a perfect pavement, to see the whole pulled up and practically ruined within perhaps a few days of the pavement having been laid.

Present Underground Arrangements Unsatisfactory.—In fact nothing could well be more unsatisfactory than the present system, although the author is free to admit that any remedy is attended with many difficulties unknown to the ordinary observer. It is now almost an axiom in building

that "no pipe must be out of sight," and anyone erecting a house and burying the supply or waste pipes in brickwork or plaster, or by other means making them inaccessible, is looked upon somewhat as a "jerry builder." The same law should apply to the streets, for what is lost to the householder in case of a desired examination for an escape is also lost to the rate-payers in examining an underground main. Undetected leakages may also, and often do, exist for long periods, someone suffering thereby, as for example:—

1. The householder in the case of a leakage from the water main percolating into his basement.
2. The water company from loss of water.
3. The gas company losing gas, as the condition of the subsoil of our streets fully proves.
4. The public generally from risks incurred in using the streets.

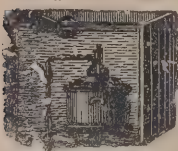
Interference with Street Surfaces.—Examinations for leakages are the main cause of disturbance in the pavements, these being generally made in a haphazard kind of way, as it is somewhat a matter of guesswork to define the exact spot requiring attention. In a recent examination in the Strand near Charing Cross an irregular area of about 19 square yards was displaced by an electric-light company before discovering the leakage for which a search was being made. Had the exact spot been known, the whole could have been repaired with less than one yard superficial of the road having been disturbed. This one leakage cost at least 14*l.* to discover, apart from the cost of the actual repairs to the electric conductor. Again, in order to find a leakage from one of the water mains, no less than six trials were made, lasting over a period of more than one month, and costing the company 25*l.*, irrespective of any repairs to the main. In addition to this expense to the owners of the several mains, the pavements are irretrievably damaged, and the life of the same materially shortened. The author has no hesitation in stating that the repaving of the Strand in 1893 would not have been necessitated for at least another year or two had it not been for the many disturbances it had been subjected to.

No Recognised System of Laying Pipes.—By the present system pipes are laid on the "first come, first served" principle; plans are submitted to the local authorities showing the proposed route and duly approved. When the ground is opened, however, it is often found that other pipes are in the way, consequently detours have to be made, and the author has known instances in a street containing many pipes where mains

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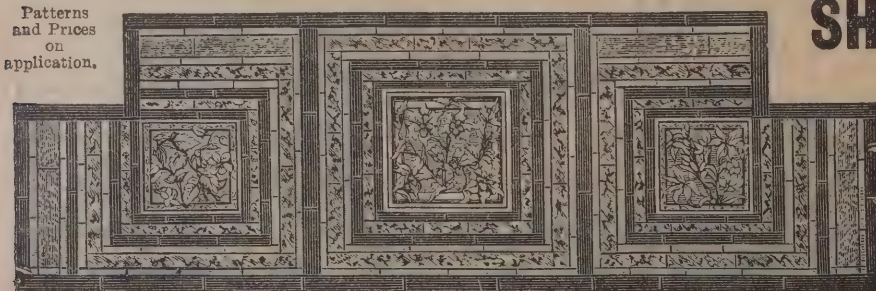
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have to be "looped" from point to point. Dead or disused pipes also exist in the streets in many cases, which should be taken out, as a foreign company may not interfere with them, consequently they become as much a block underground as the live pipes; they moreover serve as conductors for gas in case of leakages, thereby considerably increasing the risk of explosions.

Acts of Parliament.—Powers to construct subways are now generally included in local Acts for street improvements, special clauses being introduced for enforcing their use by those for whom they are constructed. It was found in the case of the Holborn Viaduct and the Southwark Street subways that the first Acts did not contain this proviso.

Company's Present Powers.—The powers granted to the various companies by Parliament give them authority to—

1. Break up and lay mains under streets.
2. Open up for repairs, and for
3. Constructing distributing boxes, &c.

All subject to due notice (except in case of emergency) being given to the authorities.

By-laws.—Under the London County Council Subways Act, 1893, the Council is empowered to make by-laws for the regulation of those using the subways. These by-laws contain stipulations as to access, time of entering, fees for entering, rental, &c., which are not altogether favourably received by the companies. It is, however, absolutely necessary to have regulations, and any one control over different interests is generally looked upon as arbitrary.

Municipalities lose Control of the Streets.—It will be seen that under existing arrangements the control of the London streets is far from being, as is generally supposed, entirely in the hands of the local authority; if the various companies were under one control the local authorities would certainly be in a better position to cope with the many difficulties they now experience.

Early Subways.—The earliest subways constructed in London are those in Southwark Street and Garrick Street, which were made about the year 1862. The first provincial town to adopt the principle was Nottingham, one having been constructed there in Victoria Street in 1863 from the designs of the late Mr. Marriot O. Tarbotton, a former member of this Society. The granite pavement in this street was not interfered with in any way for the first twenty-five years of the subway's existence. This fact speaks for itself as to the value of an underground construction.

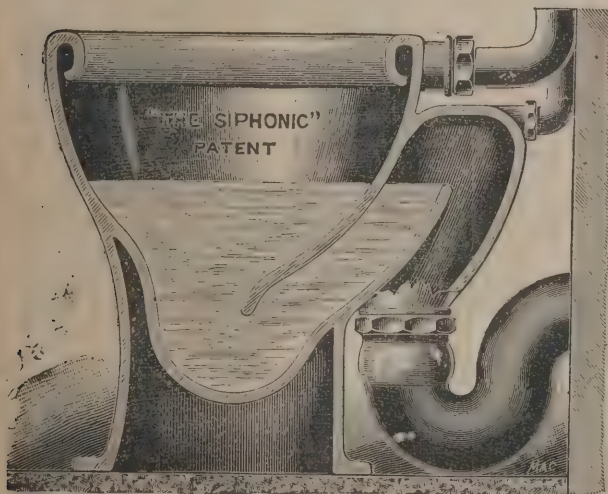
Subways have also been constructed in connection with most of the metropolitan improvements, as in the case of the Holborn Viaduct, Thames Embankment, Charing Cross Road, &c., and the principle is now being generally adopted by the County Council in all their street improvements.

London Subways.—The London subways are, however, in the author's opinion, too small, and should be made to embrace the greater part of the width of the street. The Charing Cross Road subway illustrates the author's meaning. This subway is 11 feet 6 inches wide by 6 feet 6 inches high, with laterals or sideways placed from 30 feet to 60 feet apart, and will not conveniently hold the number of pipes that should be laid therein. An insufficient number of laterals or sideways are also provided, many of the supply mains having to pass out of a lateral and then down the footway to their destination. Difficulty is also experienced in crossing the subway with branches from the main pipes, as in the case of a gas main, being placed on one side of the subway where the branch for supplying the opposite side of the street has to be taken over the subway immediately underneath the soffit of the arch, thus obstructing the passage way, besides tending to form in the bends of the pipes accumulations of water, &c. The provision of longitudinal sideways for service supplies as suggested in the author's proposals is a means of preventing this crossing of the subway by branch pipes.

Provincial Subways.—Through the courtesy of Mr. Arthur Brown, the borough engineer of Nottingham, the author is able to show details of the subways constructed in that town in 1887 at the time the author was the assistant engineer to the Corporation. These subways are similar in general arrangement to those in the metropolis, but vary in size and have more laterals or sideways. In this case, moreover, vaults were constructed beneath the footway, and being the property of the Corporation were leased to adjoining owners, thus giving some return to the Corporation for the outlay.

The subway is 10 feet wide by 6 feet 6 inches high, and is provided with ventilation by means of open gratings overhead. The sideways or laterals are 4 feet high by 3 feet 6 inches wide, spaced 40 feet apart, and so arranged as to carry the pipes and drains to and from two properties. The vaults under the footways are 9 feet 3 inches wide by 7 feet high, and are readily leased to adjoining owners at a rental equal to 5 per cent. on the cost of their construction.

The subways adopted in the metropolis as well as those in Nottingham, although being a step in the right direction, do



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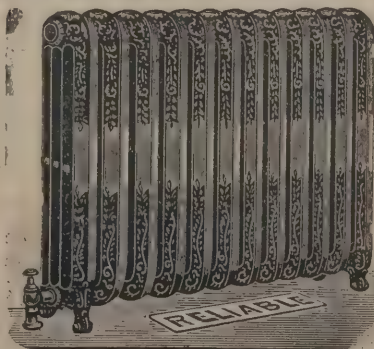
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not in the author's opinion meet the case as fully as is necessary. Considerable difficulty is experienced by the several companies possessing pipes therein in connecting from the subway to the premises to be supplied, and it is found that this construction, although minimising to a very great extent the breaking up of the street surfaces, does not, especially in London, entirely obviate it.

Difficulties of Construction.—The author is fully alive to the difficulties of designing a subway that shall be satisfactory to all parties concerned, and he is of opinion, as before stated, that most of the subways already constructed are open to several objections.

The Author's Proposals—The main points for consideration in designing a subway are:—

1. The number and size of mains likely to be laid therein (present and future).
2. Ample space for workmen.
3. Pipes to be so placed as to allow facilities for repairs, connections, &c.
4. Provision for sewer inspection and ventilation.
5. Light and ventilation to the subway.
6. Service pipes not to cross the subway.
7. Gas and water pipes to be laid with a fall.
8. Overhead construction to be water-tight.
9. Provision for street gullies, lamps, fire-hydrants and water-posts.

To meet these requirements the author has designed a subway suitable for the busiest thoroughfares of large towns, adapted for a street 50 feet wide. The principle is a triple subway having a central avenue for the trunk mains and sewer, and subsidiary or supply subways on either side for the smaller pipes, from which are taken the house connections. The central avenue is 10 feet wide by 6 feet 3 inches high, with a segmental arch over, the subsidiary subways being 6 feet wide by 6 feet high. The whole is constructed in cement concrete, with brick arches and glazed brick facings throughout. Vaults are provided beneath the footways which should be the property of the authority and leased to adjoining occupiers. The author makes a strong point of this, as in many cases the fact of the vault construction being private property prevents the public authority from making satisfactory repairs to the foot-path. A tramway is provided in the central subway for carrying materials. The public sewer is placed beneath with manholes at stated intervals, the house drains passing from the inspection "areas" in the vaults to the sewer in the ordinary manner.

Gullies are provided in the floor of the subway to receive the washings of same and in case the water mains require emptying.

The street gullies are placed over the spandrels formed by the vault construction, piers being built for encasing them where necessary. The outlets from these gullies are carried down through the subway construction into the sewer, and are also carried up to the footway pavement for inspection and cleansing. An asphalted damp course is laid over the arching, outlets for the drainage thereof being provided at intervals in the springing and connected therefrom to the sewer below.

The sideways are approached from the central way by arched openings 4 feet wide in the division walls. The whole construction is covered with concrete floated to the contour of the roadway to receive the paving. Light and ventilation are procured by means of overhead gratings opening into the roadway, and special openings for this purpose are provided at regular intervals, being adapted as street refuges. The sewers must not be ventilated into the subway; special means are provided for this by pipes taken from the sewer and carried up the adjoining buildings or connected with the external air independently of the subway.

Street lamps and water posts are fixed on the footways over the spandrels of horizontal arches, stoneware pipes being built in from the bases of same to the subsidiary subways for the reception of the gas and water supplies which can be drawn through these pipes when repairs or renovations are required. The large trunk mains rest upon sleeper walls, and the smaller ones are carried upon brackets built into the wall or attached to the overhead arching; these latter carry the telegraph, telephone and lighter wires. All the pipes are placed at a distance from the walls so as to allow for junctions, valves and connections; special passages or chases about 12 inches by 9 inches are left through the vault walls for passing through the services; these passages can be closed by suitable blocks or other means at each end.

Street fire hydrants must be placed in position similarly to the lamp columns, it being essential for them to be readily accessible from the road surfaces. Should it be necessary and desirable to construct electric transformer chambers for the high-tension cables, these can be placed in arched openings in the division walls of the subway, but in the author's opinion all transformers should be entirely upon the property of the company owning the same.

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pipes and other materials, and these can be arranged where side streets and courts abut upon the main street in which the subway is placed.

Cost of Construction.—The author does not advocate the principle of constructing subways in all existing streets, as he is well aware that it would be almost an impossibility for financial reasons as well as from interfering with the central traffic during the subway construction. He, however, is strongly of opinion that this form of subway, or a modification thereof, should be constructed in all new streets and in cases of street improvements, and in fact wherever a suitable opportunity for their introduction arises. The author estimates the cost of construction, exclusive of the street pavement and sewer, at 80*l.* per yard run of street, and he submits the following estimate of expenditure and receipts for the working thereof for a street 600 yards in length :—

Cost of subways : 600 yards at 80*l.* = 48,000*l.*

This amount could be borrowed at 3 per cent. for (say) fifty years : the annual expenses will therefore be—

Expenditure—

	£	s.	d.
48,000 <i>l.</i> at 3 per cent. for fifty years' annual repayment of principal and interest	1,694	8	0
Annual repairs and supervision (say) 1½ per cent.	720	0	0
	£2,414	8	0

Receipts—

300 vaults, spaced 4 yards apart on either side of street, at 7 <i>l.</i> 10 <i>s.</i>	2,250	0	0
Saving in cost of repaving—original costing 3,000 <i>l.</i> ; the life of same increased by the subway from four to five years	150	0	0
Ditto in sewer examinations and gully connections	20	0	0
* Annual rentals for mains in subway (say)	200	0	0
	£2,620	0	0
Estimated annual saving	£205	12	0

* The actual cost of street disturbance for five years in one of the London streets (600 yards in length) amounted to a yearly sum of 243*l.*

This estimate shows a balance in favour of subways, mainly on account of the vault rentals. Exception may be taken to this, but the author maintains that the whole of the street and subsoil thereof should be vested in the public authority, and in all applications to Parliament for new streets a clause to this effect should be embodied. The cost of the subway is almost prohibitively high, but the author brings the figures as well as the facts forward in order to show the chief difficulty experienced by local authorities in subway adoption, viz. that of cost. However it is impossible to place on the credit side in actual figures the enormous saving which would no doubt accrue were the streets to be kept free from obstructions necessitated by the present disturbance of the pavements. Accidents occur almost daily in some parts of the metropolis from this cause which never come to the knowledge of the local authorities, and there is no doubt that many hundreds of pounds are annually lost in horseflesh, rolling stock and through personal accidents to those using our streets for the ordinary business of life.

Subways in Old Streets.—Another serious difficulty occurs in adopting subways in old streets, viz. the question of taking up existing mains and relaying them in the subway; the companies would no doubt object to having their systems interfered with at their own expense, and a considerable additional outlay would be incurred by the Local Authority were the cost of this to be placed on them. The single subways as in Nottingham cost from 35*l.* per yard lineal, and these are very well adapted for provincial towns where the underground system of pipes is not so extensive as in London, but the same difficulties arise from the fact of the subways not being in duplicate so as to dispense with the necessity for crossing the subway with the supplies.

The London County Council have a scale of charges fixed at a lump sum per subway for each size of pipes, in addition to which fees are taken for time in laying or repairing pipes, and for opening and closing the subway. The author recommends abolishing all fees, and making the annual rentals inclusive, thereby reducing the number of objections raised by the companies to the present system.

It should further be mentioned that subways will effect a considerable saving in the cost of roadway maintenance and repairs to the pipes in cases of severe frost when the water in the mains becomes frozen (as in the past winter), and subsequent leakages occur. The temperature of the Nottingham subways was found to have a range of only 5 deg. against a

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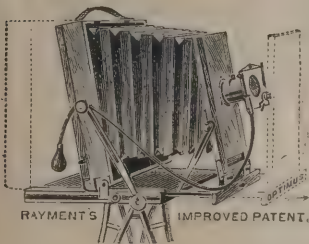
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range of 34·2 deg. in the outside air, the lowest reading in the subway during the winter of 1890-91 being 40·7 deg. as against 19·2 deg. outside, the highest in the subway being 45·8 deg. and the highest outside 53·4 deg., thus proving immunity from risks of frozen pipes.

Inspection and Supervision.—A permanent inspector should be appointed for the supervision of all subways, such inspector to be the servant of the local authority. His duty would be to see that everything was in order, and that none but those possessing proper passes were admitted. Those renting the subway should be at liberty to enter as and when they please, without having to waste time in procuring keys and giving notices as at present.

Generally.—A strong point in favour of subways is that of wear through rust in the iron pipes when laid in the ground, and which frequently becomes a serious question. Iron pipes in subways when properly coated should have almost an everlasting life.

The author's experience having chiefly been in built-up areas, it must not be inferred that he advocates the construction of expensive subways in suburban districts, but only where the traffic is so enormous and the interests of adjoining owners so great should the principle be adopted. But it is (and this is a most serious objection to their construction) necessary in busy thoroughfares to stop all traffic and interfere materially with the supplies of gas, water, electricity, &c., during their construction.

The author has accepted, without comment, the principle of the municipalities owning the subways, as it would be unwise for each company to construct its own subway, besides being prohibitive on account of the cost, which would be proportionately greater and fall directly on the companies. The whole should be constructed by the municipality, under their own control, maintained by them and leased to the companies. This is not the time or place to discuss the complex problem of municipalising the public companies, but there is no doubt such a course, from a municipal point of view, would cause less inconvenience to the public using the streets.

In conclusion, the author feels that he has introduced a very controversial subject, but one the importance of which is universally recognised; the form of subway proposed can only be adopted in central districts of large towns having valuable frontages, but some cheaper form of the triple system could well be (and should be) introduced in those districts unable to bear so heavy a cost as the subway devised by

the author. The initial difficulty is the question of cost, and the best way to overcome this is for the local authority to own the subsoil of the roads and lease the vaults constructed therein.

THE INSTITUTION OF JUNIOR ENGINEERS.

At a meeting of this Institution held at the Westminster Palace Hotel, London, on May 3, the chairman, Mr. H. J. Young, presiding, papers on "The Warming of Buildings by Hot Water" were read by Mr. Ernest King, Wh.Ex., and Mr. Kenneth Gray, members.

The subject was treated in two divisions, the first dealing with the low-pressure system and the other with that of the high-pressure. The authors having stated the theory of circulation and mode of determining the motive force in a hot-water apparatus, proceeded to deduce therefrom the best arrangement of the mains and pipes. The extent and size of piping to maintain suitable uniform temperatures in various buildings were then considered, and different forms of boilers reviewed, their particular advantages being fully discussed. It was shown to be often a matter of economy to employ a boiler somewhat larger than actually necessary. The several parts of the apparatus were described in detail, attention being called to the important improvement in hot-water engineering by the introduction of the ornamental radiator used for ventilating as well as for heating purposes. In referring to valves, those with full waterway were specially advocated. Passing on to the high-pressure system, its leading characteristics were brought forward, special mention being made of the pipe-joints, boiler coil and pipes, and the various ways of circulation. The relative merits of the low and high pressure systems were investigated, from which it appeared that the former was more advantageous, being initially cheaper, safer, more economical to work and capable of readier and more effectual control.

The papers were illustrated by a very large number of diagrams, specimens, &c., and an interesting discussion followed, in which Messrs. E. Berry, H. Parsons, Z. King, F.R.I.B.A., P. Griffiths, Loftus Perkins, W. B. Clarke, W. G. Walker, Shephard, A. S. Arundel, H. E. Duncan and B. T. King took part. A visit will be made on Saturday, May 18, to the Imperial Institute to inspect its heating system and other engineering features.

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GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.

ON Monday evening, in one of the classrooms, the students of the architectural and building classes, conducted by Mr. Charles Gourlay, to the number of over one hundred, took advantage of the opportunity of his appointment to a professorship of architecture and building construction in the college to present him with a token of their great regard for him as a teacher and a friend. This took the form of a very handsome oak writing cabinet. Mr. Isaac Low, an old student of the college, presided, and Mr. James Lockhead, the instructor in the architectural studio, made the presentation, referring to Mr. Gourlay's qualities as a conscientious and painstaking teacher, and to his genial and likeable manner as a friend. Mr. Gourlay, in reply, expressed his deep sense of their kindness, and, speaking of the future of his classes, indicated his determination to make them still more successful. Other gentlemen from the various classes also spoke, and the meeting, which was a most enthusiastic one, closed with a vote of thanks to those who had made the arrangements.

SUB-CONTRACTING IN AMERICA.

THE Master Builders' Association of the City of Boston have adopted the following rules for defining the rights and obligations of principal and sub-contractors for building work.

Article 1. Obligation of Principal Contractor to Sub-Contractor.—A principal contractor is under obligation to treat upon an equal basis all estimates which he "receives" prior to putting in his own bid. Estimates must be considered as "received" when they come into a principal contractor's possession, either by his direct solicitation or by being accepted by him. The opening of a bid, knowing it to be such, constitutes receipt of the same.

A principal contractor is under no obligation to use a bid which he has not solicited, accepted or received, but if he does not wish to use the estimate of a sub-bidder he should decline it if proffered personally, or should return it unopened if sent to him by mail or otherwise. The retention of a bid should be construed as a receipt of the same.

All bids should be considered "confidential," and a principal contractor revealing any bid received by him to any

person whomsoever, without consent of the sub-bidder, will be liable to complaint and discipline under Article 10 of the by-laws of this Association.

A principal contractor, when making up his estimate, is not entitled to receive bids from sub-contractors if he is at the same time making himself their competitor by figuring their portion of the contemplated work. It is legitimate for a principal contractor to figure all portions of work, depending upon no one for what are usually known as sub-estimates, but it is not legitimate for him to receive bids from others for sub-work if he is himself figuring those portions independently.

Article 2. Award of Sub-Contracts.—The principal contractor having been awarded a general contract should immediately award the sub-contracts to the lowest bidder in each branch.

Article 3. Penalty for not Awarding Contract to Lowest Sub-bidder.—A principal contractor, failing to award a sub-contract to the lowest sub-bidder to whom he is under obligation as previously provided, should be liable to pay damages to the said lowest bidder, in amount not less than 10 per cent. of the amount of the estimate.

Payment of such damages will not relieve the principal contractor from liability to discipline under provisions of Article 10 of the by-laws of this Association.

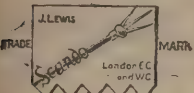
Article 4. Contracts with Sub-contractors.—The principal contractor, immediately after executing a general contract with the owner, should for his own protection, as well as the protection of the sub-bidder, execute some satisfactory form of contract or agreement with each lowest sub-bidder.

Article 5. Payments to Sub-Contractors.—Unless the contracts made with sub-contractors otherwise provide, payments during the progress of the work should be made by the principal contractor to the sub-contractors upon the same basis of payment, in relation to amount of work performed, as is prescribed in the contract made by the principal contractor with the owner.

Final payment to a sub-contractor should be considered as due at the expiration of thirty days after the completion of his work and its approval by the architect or owner, unless otherwise provided by the sub-contract or agreement.

Article 6. Submission of Bids by Sub-Contractors.—Sub-contractors in submitting bids to principal contractors should enclose them in the envelopes prepared by this Association and kept on hand for the use of sub-bidders, or should endorse the envelopes in which they are enclosed in such manner that

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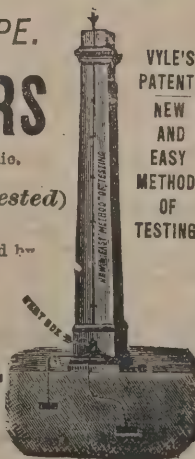
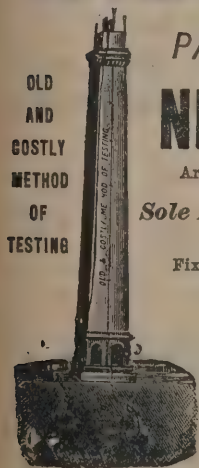
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principal contractors may know whom the bids are from, what portion of the work they comprehend, and the particular building they apply to.

Sub-contractors who fail to so enclose and endorse their bids cannot claim protection or redress under the first article of this code.

Article 7. Obligation of Sub-Contractor to Principal Contractor.—Should a sub-contractor refuse to contract at the amount of the estimate he has given to a principal contractor who has used the said estimate in good faith, he then should be liable to the said principal contractor for damages in amount not less than the difference between the amount of the estimate which was submitted by him and the amount at which the principal contractor may be obliged to contract the work.

Payment of such damages will not relieve the sub-contractor from liability to discipline under provisions of Article X. of the by-laws of this Association.

Article 8. Obligations of Sub-Contractors to each Other.—Any sub-contractor suspected of unfair treatment of his fellow sub-contractors will be liable to complaint and discipline under Article X. of the by-laws of this Association.

Article 9. Trading Sub-Bids.—Trading upon sub-bids will be considered sufficient cause for complaint and discipline as provided by Article 10 of the by-laws of this Association.

Article 10. Bids to Architects or Owners.—When bids for separate departments of work on a building are solicited by the architect or the owner, they should be submitted with the understanding that they are direct estimates, for which direct contracts are to be made by the owner with the lowest bidder, and no other disposition of such bids should be permitted without consent of the bidder submitting the same.

Sub-bids should be given only to the principal contractors who are estimating the work in question, and should not be left with architects or owners for the inspection and information of principal contractors. Sub-contractors must understand that bids thus left with architects or owners are in great danger of losing their confidential character, and that if they so leave them they cannot claim protection or redress under the first article of this code.

Suggestions.—Members of this Association having sub-contracts to let or material to buy should, as far as may be consistent with business principles, deal only with members of the Association, or at all events give their fellow-members an opportunity to compete, and then give them the preference, other things being equal.

All bidders should take cognisance of the danger they may be subjected to through the practice, so prevalent in some architects' offices, of making changes in plans or specifications, or in both, during the progress of estimating. Correction of this pernicious practice can only be obtained through refusal by contractors to estimate under such conditions.

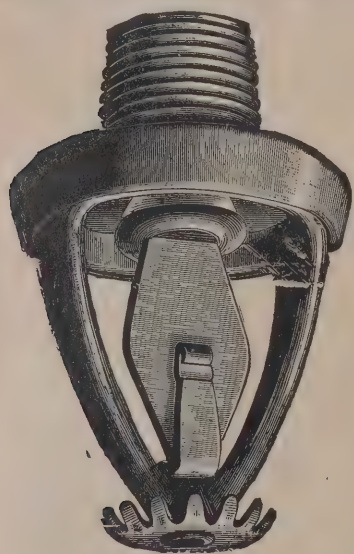
PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

7993. William Birch, for "Improvements in and ventilating cowls."
8051. Wilhelm Cohn, for "Improved collapsible structure or house for travellers and the like."
8127. Paul Rordorf and David Rordorf, for "Improvements in fastenings, devices or clamps for building purposes and the like."
8154. Sidney Gamble, for "An improved ventilating sash-fastener."
8189. Frederick Harvard Stacey and George Jabez Beedham, for "Automatic apparatus for supplying disinfectants to water-closets and the like."
8224. Ralph Thomas Vaux, for "Improvements in chimney-cowls or like apparatus."
8227. Walter John Blunden, for "An improved window sash-fastener."
8229. Robert George Sherrington, for "Improvements in cowls and ventilators."
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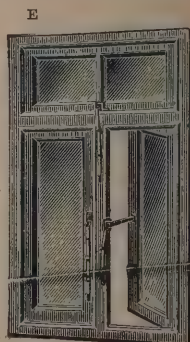


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CONTRACTS OPEN.

ABERAMAN.—May 20.—For Building Thirty or more Houses. Mr. G. A. Treharne, Architect, 5 Canon Street, Aberdare.

ABERFAN.—May 23.—For Building House and Alterations to Chapel. Rev. J. M. Davies, Glannant Villa, Aberfan.

ABERYSTWYTH.—May 31.—For Building Four Dwelling-houses. Mr. J. A. Jones, Architect, Plascrug Lodge, Aberystwyth.

ASPATRIA.—May 20.—Dwelling-house. Mr. John Gill, Belle Vue, Aspatria.

BARNES.—May 21.—For Erection of a Postmen's Sorting Office. Messrs. Hunt & Stewart, 45 Parliament Street, S.W.

BARNSTAPLE.—May 17.—For Alterations to Workhouse. Mr. W. C. Oliver, Bridge End, Barnstaple.

BARROWFORD.—May 20.—For Sewerage Works. Mr. J. T. Landless, Station Buildings, Nelson.

BARROW-ON-HUMBER.—May 20.—For Building Parish Schools. Mr. W. H. Kitching, Architect, Cogan Chambers, Hull.

BARROW-ON-SOAR.—May 17.—For Sewerage Works Required for the Village of Swithland, in the County of Leicester, Consisting of Pipe Sewers with Manholes, &c. Pumping Station, Laying and Jointing Rising Main, &c., and Laying-out Sewage Field. Mr. J. B. Everard, M.I.C.E., 6 Millstone Lane, Leicester.

BEIGHTON.—May 17.—For Extension of Schools. Messrs. Hemsoll & Paterson, Architects, Imperial Chambers, Norfolk Row, Sheffield.

BELFAST.—May 17.—For Building Presbyterian Church. Messrs. Young & Mackenzie, Architects, Donegall Square East, Belfast.

BELFAST.—May 30.—For Additions to Lunatic Asylum. Mr. P. J. Tuohy, Board of Control, Custom House, Dublin.

BRADFORD.—May 20.—For Building Warehouse &c. Mr. J. W. C. Atkinson, Architect, 1 Iregate, Bradford.

BRADFORD.—May 24.—For Building Four Houses, Low Moor. Mr. Herbert Hodgson, Architect, 27 Kirkgate, Bradford.

BRIDGEND.—May 18.—For Building Church at Bryncethin Mr. E. Jenkin Williams, 14 High Street, Cardiff.

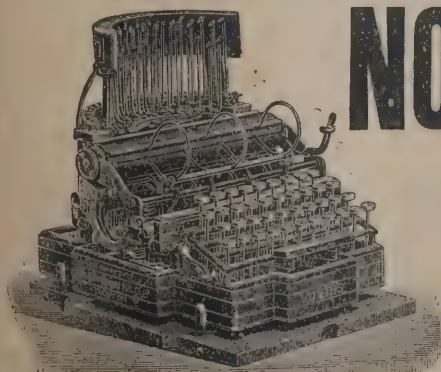
BRIDGE-END.—May 27.—For Erection of Two Dwellings and Alterations at the Nash Lighthouses. Mr. C. A. Kent, Trinity House, London.

BELFAST.—June 10.—For Construction of Steel Principal Roof at Terminus. Mr. R. B. Belfrage, District Engineer, Belfast.

BELFAST.—May 26.—For Building Stables at Great Northern Railway Company's Goods Depot. Messrs. Young & Mackenzie, Architects, Donegall Square East, Belfast.

BUCKS.—June 5.—For Brick and Iron Bridges at Crendon and Ditton Park. Mr. R. J. Thomas, County Surveyor, Aylesbury.

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CHESTER.—May 22.—For Additions to Agricultural Institute. Mr. Stanhope Bull, County Surveyor.

COCKERMOUTH.—May 18.—For Additions to Lorton Day School. Mr. Marsh, Surveyor, Cockermouth.

COLNE.—May 17.—For Building Stables for Messrs. Lancaster & Andrews. Mr. G. Bower, Architect, 1 Dixon's Chambers, Market Street, Colne, Lancashire.

COVENTRY.—May 22.—For Alterations to Board Room, &c., for the Guardians. Mr. Harry Quick, Architect, Hertford Street, Coventry.

CROYDON.—May 23.—For Building Cemetery Chapel, Entrance Lodge, Boundary Fences, &c. The Borough Engineer.

DARLINGTON.—May 25.—For Building Parish Schools. Mr. G. Gordon Hoskins, Architect, Northgate, Darlington.

DORKING.—May 30.—For Making-up Two Roads. Mr. G. Somers Matthews, A.M.I.C.E., 35 High Street, Dorking.

DUNDEE.—June 1.—For Building Post Office. Mr. P. Lawrence, 50A Frederick Street, Edinburgh.

EASINGWOLD.—May 17.—For Drainage Work at the Workhouse. Mr. F. J. H. Robinson, Guardians' Offices, Easingwold.

EAST RETFORD.—May 31.—For Building Public Baths. Mr. D. J. Kennedy, Borough Surveyor, Retford.

EDMONTON.—May 21.—For Two Galloway Lancashire Boilers, One to be Fixed at the Edmonton Workhouse, Upper Edmonton, and One at the Chase Farm Schools, Enfield; also for Removal of Two Small Cornish Boilers from Edmonton Workhouse, and Resetting same at Enfield Workhouse. Mr. T. E. Knightley, 106 Cannon Street, E.C.

EDMONTON.—May 21.—For Paving Yards at the Workhouse. Mr. T. E. Knightley, 106 Cannon Street.

ENFIELD.—May 30.—For Erection of a Block of Schools. Mr. G. E. T. Lawrence, 181 Queen Victoria Street, E.C.

FULHAM.—May 30.—For Painting, Distempering and Other Works at Infirmary. Mr. T. Aplin Marsh, Union Offices, Fulham Palace Road, W.

GLOUCESTER.—May 21.—For Constructing Reservoir and Laying Cast-iron Pipes. Mr. Wm. Fox, 5 Victoria Street, Westminster.

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IPSWICH.—May 20.—For Additions, &c., to Crown Street. Sunday Schools. Mr. Frank Brown, Architect, 15 Tower Street, Ipswich.

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KILLINGTON.—May 18.—For Restoration of Church and Rehanging Bells. Mr. John F. Curwen, Architect, 51 Highgate, Kendal.

KIRKBRIDE.—May 25.—For Restoration of Chancel. Mr. G. D. Oliver, Architect, Carlisle.

LANGFORD.—May 18.—For Building Pair of Cottages. Mr. P. M. Beaumont, Architect, Maldon, Essex.

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MONTROSE.—May 17.—For Building Public School. Mr. Wm. Ross, Clerk, 10 Castle Street, Montrose.

MOSS SIDE.—May 18.—For Building Board School and Caretaker's House. Messrs. Woodhouse & Willoughby, 100 King Street, Manchester.

NEW CROSS.—May 23.—For Providing and Fixing Hot-water Heating Apparatus at South-Eastern Fever Hospital. Mr. T. Duncombe Mann, Norfolk House, Norfolk Street, W.C.

NEWMARKET.—May 28.—For Enlargement of Post Office. Mr. W. H. Strudwick, Surveyor, 14 Parliament Street, S.W.

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ROTHERHAM.—May 17.—For Building Two Sale Shops and Dwelling-houses. Mr. J. Platts, Architect, Rawmarsh.

ROTHERHITHE.—May 20.—For Erection of Buildings for Town Hall. Messrs. Murray & Foster, Architects, Adelphi Chambers, 7 John Street, W.C.

RYHILL.—May 18.—For Building Infants' School. Rev. G. S. Filliter, Havercroft, Wakefield.

SALTASH.—May 20.—For Building Two Houses. Mr. Pearce, Architect, 2 Lansdown Cottages, Albert Road, Saltash.

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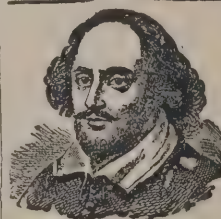
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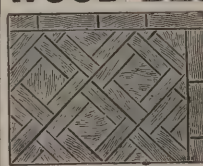


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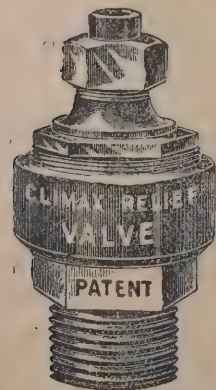
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BRIGHTON.

For Construction of Engine-house and Boiler-house at the Pumping Station, Patcham, for the Brighton Corporation. Mr. JAS. JOHNSTON, Assoc. M. Inst. C.E., Engineer. Quantities by Mr. FRANCIS J. C. MAY, M. Inst. C.E.

Kirk & Randall, Woolwich £2,942 0 0
J. Parsons & Sons, Hove* 2,897 0 0

* Messrs. Parsons & Sons' tender accepted subject to the approval of the Council.

For Extension of the Corporation Electricity Generating Station, North Road, Comprising Engine-room, Boiler-house, Coal Stores, Chimney Shaft, and Other Works in Connection therewith, for the Town Council. Mr. FRANCIS J. C. MAY, M. I. C. E., Engineer, Town Hall, Brighton.

Wilkinson Bros., London £14,573 0 0
B. Cooke & Co., Battersea 14,300 0 0
P. Peters & Son, Horsham 13,045 0 0
J. Parsons & Son, Hove 12,265 0 0
J. Longley & Co., Crawley 12,169 0 0
W. A. FIELD & CO., Brighton (accepted) 12,086 0 0

BRISTOL.

For New Shop in High Street, Staple Hill, for Mr. John Phipps. Mr. W. HOLBROW, Surveyor, 6 St. Stephen's Avenue, Bristol.

Love & Wait £560 0 0
Edwards Bros. 499 0 0
E. Clark 495 0 0
E. Hill 445 0 0
F. Prosser 439 0 0
PROSSER, amended (accepted) 330 0 0

For Additions to Premises of Messrs. R. W. Ashley & Son, Portland Square. Mr. W. HOLBROW, Surveyor, 6 St. Stephen's Avenue, Bristol.

Nichols £427 0 0
R. Wilkins & Son 389 0 0
E. Clark 385 0 0
Cowlem & Son 373 0 0
Love & Wait 360 0 0
H. J. ROSSITER (accepted) 357 10 0

CAMELFORD.

For Enlarging and Putting New Interior to the Camelford United Methodist Free Church, and Building New School and Classrooms, &c. Messrs. WISE & WISE, Architects, Launceston.

W. L. Doidge, Launceston £680 0 0
Lobb & Richards, Camelford 650 0 0
HOOPER & DENNIS, Camelford (accepted) 645 0 0

CHAILEY.

For Alterations (including the Supply and Fixing of Hot and Cold-water Tanks) in Connection with the Heating and Bathing Apparatus, &c., in One of the Casual Wards at their Workhouse at East Chilton, for the Guardians of Chailey Union.

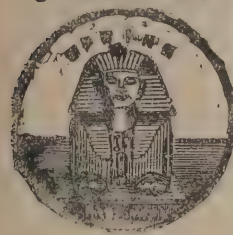
Stater & Owen, Westminster £124 0 0
E. H. & R. Fuller, Newick, near Lewes 94 0 0
Constructional Ironworks Co., Bow 90 0 0
C. A. Wells, Lewes 82 0 0
A. SHAW, Lewes (accepted) 71 10 0

CHICHESTER.

For Building Proposed Asylum at Chichester, Sussex, for the West Sussex County Council. Sir ARTHUR W. BLOMFIELD, A.R.A., & SONS, Architects, 6 Montague Place, Montague Square, London, W. Messrs. GARDINER, SON & THEOBALD, Surveyors, 110 Great Russell Street, Bedford Square, London.

Holland & Hannen £149,500 0 0
Woodward & Co. 149,400 0 0
Shillitoe & Sons 145,000 0 0
Macey & Sons 145,000 0 0
Dove Brothers 143,995 0 0
Colls & Sons 141,888 0 0
Cornish & Gayner 138,941 0 0
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LONGLEY & Co. (accepted) 114,669 0 0

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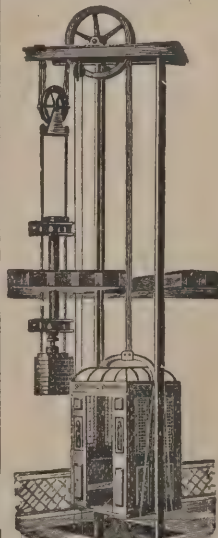
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Messrs. BOTTLE & OLLEY, Architects, 5 Queen Street, Great Yarmouth. Quantities by Architects.		
E. Sewell, Lowestoft	£1,471	0 0
Allerton & Earl, Lowestoft	1,445	0 0
G. Beckett, Great Yarmouth	1,365	0 0
J. Ward, Great Yarmouth	1,355	10 0
J. F. W. Bray, Great Yarmouth	1,276	0 0
F. Grimble, Great Yarmouth	1,244	0 0
G. E. HAWES, Norwich (accepted)	1,240	0 0

CROYDON.

For External Painting and other Works at their Infirmary, Mayday Road, Croydon, for the Guardians. Mr. FREDERICK WEST, Surveyor, 23 Coombe Road, Croydon.		
J. W. Jones, South Kensington	£580	0 0
W. Smith & Son, Croydon	555	0 0
W. W. Webber, Fulham	530	0 0
F. W. Sedgwick, Croydon	519	0 0
W. J. Penfold, Upper Sydenham	479	15 6
T. White & Son, Croydon	460	0 0
For Supply of Water-Vans at per Van, for the Corporation.		
W. Glover & Son, Warwick	£36	15 0
Hammond & Hussey, Croydon	36	10 0
Barrows & Co., Banbury	36	10 0
E. H. Bayley & Co., Southwark	35	10 0
Clemens Abel & Co, Worcester	35	0 0
W. Smith & Son, Barnard Castle	32	10 0
* Accepted, One Van each.		

For Road Repairs, Croydon.

Fell Road.

Robertson & Grant	£230	0 0
A. Bullock	194	9 2
Mowlem & Co.	194	0 0
H. Lake	194	0 0
STREETER BROS (accepted)	186	5 4
Surveyor's estimate	238	6 11

Ledbury Road.

Robertson & Grant	229	0 0
J. Mowlem & Co.	229	0 0
Streeter Bros.	199	11 4
A. BULLOCK (accepted)	193	14 3
Surveyor's estimate	270	0 11

CWMAMAN.

For Taking-down Existing Welsh Calvinistic Methodist Chapel, &c., at Cwmaman, Aberdare, and Building New Chapel and Schoolrooms.		
Davies & Morgans, Pembroke	£2,748	0 0
WILLIAMS & WILLIAMS, Cathays, Cardiff (accepted)	2,700	0 0

DEVONPORT.

For Alterations to Front of Royal Sailors' Home, Duke Street Devonport. Mr. H. G. LUFF, Architect, 64 Chapel Street, Devonport.		
G. H. Smith & Son, Devonport	£342	15 0
W. Littleton, Devonport	339	10 0
J. HEALY & SON, Devonport (accepted)	333	0 0

DEWSBURY.

For Two Lodges at Entrances to Crow's Nest Park, Dewsbury, for the Corporation.		
W. Scott & Sons, Dewsbury	£990	10 8
E. Chadwick & Sons, Dewsbury	911	19 2
S. Armitage & Sons, Dewsbury	840	4 4
W. H. Clegg, Dewsbury	834	9 6
CRABTREE & DENTON (accepted)	763	3 0

GOLCAR.

For Building Co-operative Stores at Town End, Golcar, for the Central Working Men's Co-operative Society, Limited. Mr. ARTHUR SHAW, Architect, Knowl, Golcar.		
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J. Haigh & Sons, Golcar, mason and bricklayer.		
J. Garside, Wells, carpenter and joiner.		
W. Armitage, James Street, plasterer and painter.		
T. Allison, Limited, Milnsbridge, slater.		
S. Sykes, Linthwaite, plumber.		
J. & J. Baxter, Golcar, ironwork.		

GUILDFORD.

For Erection of Oak Fence at the Extension to Guildford Cemetery. Mr. A. J. STURGES, Architect, High Street Chambers, Guildford.		
E. & A. Miles, Guildford	£329	2 8
Murray Marshall, Godalming	319	0 0
George Lee, Cobham, Surrey	293	4 6
Taylor & Brooker, Dorking	290	0 0
STANLEY ELLIS (accepted)	274	0 0

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For Painting and Decorating at Cromwell House, Commercial Road, Guildford, for Mr. May Colebrook. Mr. A. J. STURGES, Architect, High Street Chambers, Guildford.

Higlett & Hammond, Guildford	£102	0	0
P. C. May, Guildford	97	0	0
Robert Wood, Guildford	91	0	0
STANLEY ELLIS, Guildford (accepted)	87	0	0

For Erection of a Common Lodging-house, Mill Lane, Guildford, for Mr. W. Tilbury. Mr. A. J. STURGES, Architect, High Street Chambers, Guildford.

Thomas Kingerlee, Oxford	£1,770	0	0
Smith & Sons	1,660	0	0
A. Strudwick, Guildford	1,656	0	0
A. Johnson, Guildford	1,649	0	0
Stanley Ellis	1,647	0	0
Robert Smith	1,646	0	0
Higlett & Hammond	1,633	0	0
P. C. May	1,420	0	0
Tribe & Robinson*	1,414	0	0

* Accepted subject to modification.

HAVANT.

For Building School for the Havant School Board. Mr. A. E. STALLARD, F.S.I., Architect, Havant. Quantities by Architect.

Light & Son, Portsmouth	£4,284	0	0
J. H. Corke, Southsea	4,180	0	0
Clark & Son, Portsmouth	4,141	0	0
Peters & Son, Horsham	3,890	0	0
W. J. Perkins, St. Paul's Road, Southsea*	3,549	0	0

* Accepted subject to approval of Education Department.

HORFIELD.

For Construction of Clear-water Outfall Drain, about 700 Lineal Yards in Length, for the Horfield Urban District Council. Mr. A. P. I. COTTERELL, Engineer, Lonsdale Chambers, Baldwin Street, Bristol.

Durnford & Son	£1,030	0	0
Lloyd & Powell	950	0	0
J. Perkins	925	0	0
S. Ambrose	901	9	4
Dare & Co.	875	18	0
G. H. Wilkins	865	18	9
A. J. Beaven, Dean Lane, Bedminster	860	0	0
Love & Waite (withdrawn)	640	0	0

HELSEBY.

For Erection of New House, Helsby Hill, Cheshire, for Mr. Thomas Robinson. Mr. SAMUEL DAVIES, M.S.A., Architect, Runcorn and Frodsham.

BECKETT & Co., Hartford (accepted) £695 0 0

LANCHESTER.

For Construction of Sewage-Disposal Works at Cronywell, in Parish of Medomsley, comprising Precipitation and Filter Tanks, Mixing-house, &c., for the Lanchester Rural District Council. Mr. J. E. PARKER, Engineer, Union Offices, Lanchester.

G. H. BELL, Bishop Auckland (accepted) £1,577 15 0

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For Road-making, Sewering, &c., at Grasmere Drive and Derwent Drive, Sea View Road, Liscard. Mr. H. ABBEY, Surveyor, 3 Crosshall Street, Liverpool.

G. L. Desoer, Liverpool	£963	12	2
J. Boughey, Liscard	941	6	5
L. Marr & Son	931	6	3
J. H. WILSON, Liscard (accepted)	889	14	6

LIVERPOOL.

For Painting and Repairs at the Port Sanitary Hospital at New Ferry.

C. E. MARSHALL, Liverpool (accepted) £113 0 0

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For Stoneware Pipe Sewer, with Manholes, Lampholes, &c., and Constructing Settling Tank and Automatic Flushing Tank, for the Sewerage of Pontcana, Llandaff. Mr. W. FRASER, Engineer, 270 Cowbridge Road, Canton, Cardiff.

T. Street, Pentyrch	£260	16	6
Williams & Thomas, Cardiff	252	15	0
Knight & Gregory, Cardiff	247	10	3
E. H. Page, Cardiff	236	15	6
Barnes, Chaplin & Co., Rhondda	229	1	8
Mackay & Davies, Cardiff	222	9	0
J. Rees, Ely, Cardiff	217	4	6
E. Rees, Whitchurch	213	9	6
W. Cox, Llandaff	209	7	0
F. Ashley, Cardiff	198	11	0
T. WOOD & SON, Whitchurch, Cardiff (accepted)	182	2	2
Engineer's estimate	185	10	0

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Higgs & Hill	10,584	1,124	11,708
Lascalles & Co.	9,993	1,025	11,018
Holliday & Greenwood	9,877	1,077	10,954
Ashby & Horner	9,832	1,038	10,870
J. Greenwood	9,794	986	10,780
F. & H. F. Higgs	9,589	986	10,575
Patman & Fotheringham	9,140	871	10,011

For Gas Engineering and Fittings required at the Credon Road Schools, Upton Park, and Pupil Teachers' Centre, Russell Road Schools, Custom House, E, for the West Ham School Board. Messrs. J. T. NEWMAN & JACQUES, Architects, 2 Fen Court, E.C.

Credon Road.

Potter & Sons, London	£365	0	0
Strode & Co., London	287	0	0
Wentworth & Co., London	253	0	0
Purcell & Nobbs, London	238	0	0
Christie & Co., Aldgate	236	0	0
Creek & Powell, Stratford	220	0	0
Hulett & Co., London	219	18	0
Finegan & Co., Stratford	212	5	0
W. Simmons, Stratford	211	10	0
Vaughan & Brown, London	211	0	0
J. & W. Jeal, London	203	0	0
C. JONES, Stratford (accepted)	199	15	6

Russell Road.

Potter & Sons	181	0	0
Creek & Powell	150	0	0
Strode & Co.	143	0	0
C. Jones	130	0	0
Purcell & Nobbs	129	0	0
Wentworth & Co.	117	10	0
Finegan & Co.	110	0	0
Vaughan & Brown	104	0	0
W. Simmons	103	10	0
Christie & Co.	102	0	0
Hulett & Co.	93	8	0
J. & W. JEAL (accepted)	91	7	6

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For Erection of Shelters, for the London County Council.

Clissold Park.

Hatfield & Son	£104	12	7
W. H. Lascalles	92	19	4
E. Proctor	88	2	9
Seath & Harris	86	15	0
M. Hartson	79	19	4
R. Williams & Sons	79	3	5
E. Spencer & Co.	77	17	4
Julyan & Lockyer	76	16	2
J. Humphrey	71	3	7
T. Barden	70	8	3
A. Wallis*	69	19	8

North Woolwich Gardens.

W. H. Lascalles & Co.	210	0	0
Hatfield & Son	209	5	2
Seath & Harris	180	12	0
E. Proctor	176	5	6
M. Hartson	159	18	9
R. Williams & Sons	158	6	10
E. Spencer & Co.	155	14	8
Julyan & Lockyer	153	12	4
J. Humphrey	142	7	3
T. Barden	140	16	6
A. Wallis*	139	19	4

* Recommended for Acceptance.

For Building Postmen's Sorting Office at Wood Green, for the Commissioners of H.M. Works and Public Buildings.

A

Hatfield & Son	£2,507	0	0	£10	0	0
J. Webb	2,250	0	0	17	0	0
F. Voller	2,230	0	0	14	0	0
W. Scrivener & Co.	2,173	0	0	11	0	0
J. Willmot & Sons	2,133	0	0	12	0	0
E. Lawrance & Sons	2,128	0	0	10	0	0
G. Godson & Sons	2,100	0	0	10	0	0
T. White & Son	2,089	0	0	*		
C. Peek	2,039	0	0	9	0	0
Multon & Wallis	2,009	0	0	10	0	0
Williamson & Sons	1,974	0	0	10	0	0
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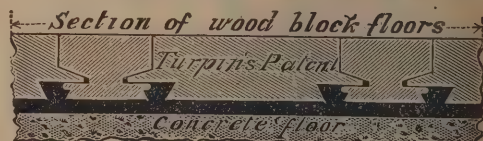
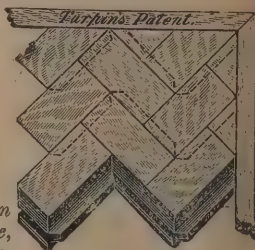
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For Gas Fittings throughout the New Infants' School, East Finchley, for the Finchley School Board.

Ungar & Co., Islington	£137	18	0
Reynolds & Co., Richmond	124	0	6
G. A. Oram, East Finchley	122	7	6
J. & C. Christie, Aldgate	121	0	0
S. Jones, Finchley	119	10	0
Vaughan & Brown, Kirby Street	114	10	0
W. Simmons, Stratford	112	17	0
Munday & Son, Tower Hill	106	17	0
Hulett & Co., High Holborn	100	0	0
J. & W. Jeal, Old Street	99	0	0
E. & F. Harrowin, Hampstead	96	8	0
FINEGAN & Co., Stratford (accepted)	87	11	4

For Building Infectious and Non-infectious Mortuaries, Post-mortem Room, &c., on the Site of Old Mortuary in Burial Ground, St. Marychurch Street, Rotherhithe, for the Vestry of Rotherhithe. Mr. NORMAN SCORGIE, Surveyor, Lower Road, Rotherhithe.

A. W. White & Co., Rotherhithe	£1,277	0	0
H. Knight & Son, Tottenham	1,219	8	10
R. E. Williams & Son, Battersea	1,146	0	0
J. Bullers, Bermondsey	1,137	0	0
S. Chafen, Deptford	1,123	0	0
Balaam Bros., Old Kent Road	1,110	0	0
W. Pavey, Plumstead	1,073	9	0
T. WHITE & SON, Bow (accepted)	998	0	0

For Bakery and Stabling, Gordon Road, Peckham, for Dr. Hague. Mr. J. WILLIAM STEVENS, Architect, 21 New Bridge Street, E.C.

Beckey	£528	0	0
White	493	0	0
Robson	462	0	0
Parker	459	0	0
McLOUGHLIN (accepted)	414	0	0

For Alterations and Repairs Nos. 90 and 92 High Street, Kingsland, N., for Mr. R. Tobitt. Mr. J. WILLIAM STEVENS, Architect, 21 New Bridge Street, E.C.

Ballard	£487	2	0
Currie	476	0	0
Hutchings	448	0	0
Robson	393	0	0
WADE (accepted)	359	15	0

LONDON—continued.

For the Erection of Quarters for the Medical and Nursing Staffs employed at the South Wharf.

J. Bullers, Bermondsey	£10,400	0	0
E. Proctor, Woolwich	10,300	0	0
H. Wall & Co., Kentish Town	9,600	0	0
T. White & Son, Bow	9,482	11	9
W. Johnson & Co., Limited, Wandsworth	9,460	0	0
F. & H. F. Higgs, Loughborough Junction	9,410	0	0
G. E. Todd, Hackney (informal)	9,279	0	0
Kirk, Knight & Co., Sleaford	9,066	0	0
Kirk & Randall, Woolwich	8,649	0	0
Girling & Coe, Ipswich	8,590	0	0
G. Godson & Sons, Kilburn	8,317	0	0

For Shops and Flats at Electric Avenue, Brixton, S.W., for Mr. John Fyfe. Mr. W. H. GIBBS, Architect, 5 West Kensington Terrace, W. Quantities by Messrs. J. WALDRAM & SON, 17 Buckingham Street, Adelphi, W.C.

Higgs & Hill, South Lambeth Road, S.W.	£12,940	0	0
C. Wall, Lot's Road, Chelsea, S.W.	12,300	0	0
Rider & Sons, Union Street, Borough, S.E.	12,148	0	0
Lansdown & Co., Richmond, Surrey	11,989	0	0
Clarke & Bracey, 64 Coleman Street, E.C.	11,987	0	0
Dove Bros., Islington, N.	11,938	0	0
Dearing & Son, Islington, N.	11,750	0	0
B. E. Nightingale, Albert Embankment, S.E.	11,638	0	0
Holloway Bros., Battersea, S.W.	11,630	0	0
Johnson & Co., Limited, Wandsworth Common, S.W.	11,590	0	0
Grover & Sons, Wilton Works, N.	11,378	0	0
Higgs & Higgs, Loughborough Junction, S.E.	11,187	0	0
Quantity surveyor's estimate	11,985	0	0

For Laying 1½-inch Pitch Pine Wood-Block Flooring in the Receiving Wards of Poland Street Workhouse, W., for the Guardians of the Westminster Union. Messrs. JOHN WALDRAM & SON, Surveyors, Buckingham Street, Charing Cross, W.C.

	Per Superficial Yard.
Gregory & Co., Clapham Junction	6s.
Roger L. Lowe, Farnworth, Lancs.	5s. 9d.
Charteris & Longley, Earl Street, S.W.	5s. 9d.
Acme Wood Flooring Co., Limited, Victoria Park	5s. 6d.
THE WOOD BLOCK FLOORING CO., Queen Victoria Street (accepted)	5s. 6d.

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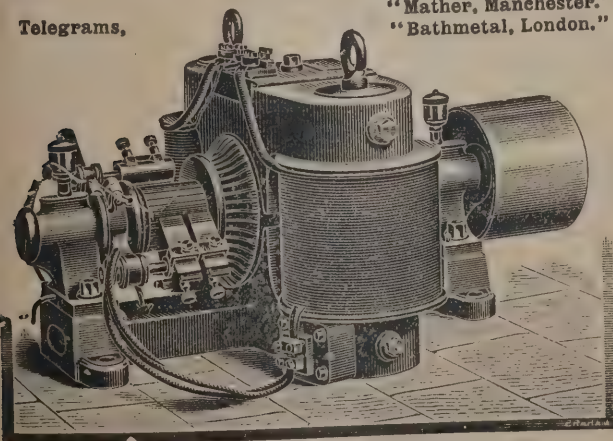
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LONDON—continued.

For Rebuilding West Block of the Workhouse, Poland Street, W., for the Guardians of the Westminster Union. Messrs. JOHN WALDRAM & SON, Engineers and Surveyors, Buckingham Street, Charing Cross, W.C. Quantities supplied.		
Shillitoe & Son, Bury St. Edmunds	£12,300	0 0
A. Kellett, Willesden	11,631	0 0
F. & F. H. Higgs, Loughborough Junction	11,200	0 0
Dearing & Son, Islington	11,170	0 0
McCormick & Sons, Canonbury	10,987	0 0
Perry & Co., Stratford	10,890	0 0
B. C. Nightingale, Albert Embankment	10,875	0 0
Walter Wallis, Balham	10,825	0 0
Thos. Nicholson, Old Compton Street	10,725	0 0
Geo. Neal, Paddington	10,599	0 0
Lansdown & Co., Richmond, Surrey	10,497	0 0
Henry Flint, High Wycombe	10,487	0 0
Johnson, Limited, Wandsworth Common	10,470	0 0
Grover & Son, Islington	10,448	0 0
Johnson & Manners, Great Pulteney Street, W.	10,390	0 0
Surveyor's estimate	10,496	0 0
For Erection of New Staff Block for Domestic and Alterations and Additions to the Male Staff Block and Ambulance Nurses' Block at the Western Hospital, Seagrave Road, Fulham, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C. Quantities by Mr. J. STEVENS.		
Windebank & Co., Balham	£9,940	0 0
Shillitoe & Son, Bury St. Edmunds	9,857	0 0
E. Lawrence & Sons, Wharf Road, City Road	9,677	0 0
C. Miskin, St. Albans	9,400	0 0
Holliday & Greenwood, Loughborough Park	9,149	0 0
Leslie & Co., Limited, Kensington Square	9,023	0 0
C. Dearing & Sons, Islington	8,750	0 0
W. JOHNSON & CO., Limited, Wandsworth Common	8,490	0 0
For Rebuilding the Red Cow Public-house, No. 67 Mile End Road, E., for Messrs. Sutton, Carden & Co. Mr. EDWARD MONSON, F.R.I.B.A., Architect, Acton Vale, W.		
George Lyford, Shepherd's Bush	£4,750	0 0
Godson & Sons, Kilburn	4,549	0 0
Wilkinson Bros., Finsbury Park	4,500	0 0
G. Wade, Chelsea	4,489	0 0
T. E. Mitchell, Hampstead Road	4,328	0 0
PATTINSON BROS., Whitehall (accepted)	4,292	0 0

NEWINGTON.

For Building Premises at Newington, Hull, for Mr. T. A. Haigh. Mr. JAS. J. ADAMSON, Architect, 3 and 4 Junction Place, Hull.		
M. Harper	£1,217	16 0
J. Caunt	1,211	3 11
Morrell & Son	1,209	0 0
J. Drury	1,187	14 0
Blackburn & Son	1,178	0 0
Simpson & Son	1,143	3 6
B. Nicholson	1,126	19 6

PAULERSPURY.

For Construction of Drain, with Manholes and Inspection Chambers, Pureyend, Paulerspury, for the Potterspury Rural District Council. Mr. J. COATES, Surveyor, Stoney Stratford.		
J. S. Cowley, Stoney Stratford	£95	0 0
Tomlin, Paulerspury	95	0 0
T. P. Robinson, Wolverton	88	12 6
J. Richardson, Potterspury	71	18 6
W. LEPPER, Paulerspury (accepted)	48	12 0
W. Sturgess & Sons, Road, Northants	45	0 0

QUEENSBURY.

For Extensions and Alterations to Central Stores of the Queensbury Industrial Society, Limited. Mr. JOHN DRAKE, Architect, Queensbury, near Bradford.

Accepted Tenders.

E. Balmforth, Queensbury, mason	£1,640	0 0
J. Farnell & Son, Queensbury, joiner	496	3 6
J. Mackrell, Elland, smith and ironfounder	296	16 0
M. Stocks, Queensbury, plumber and glazier	254	0 0
T. Greenwood, Queensbury, plasterer	71	10 0
T. Greenwood, Queensbury, slater	52	0 0
S. Gregson, Queensbury, painter	37	0 0

RHOSNEIGER.

For Building Bungalow at Rhosneiger, for Mr. W. Douglas Jones. Mr. RICHARD DAVIES, Architect, Bangor.

W. & O. PRITCHARD, Llanfair (accepted) . . . £490 0 0

RUNCORN.

For Erection of New House, Weston Road, for Mr. Thomas Handley, J.P. Mr. SAMUEL DAVIES, M.S.A., Architect, Runcorn and Frodsham.

W. FARRELL & SON, Runcorn (accepted) . . . £740 0 0

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RUABON.

For Additions to the Ruabon Grammar School. Quantities by Mr. J. D. DENNY, Llangollen.	
E. & R. Owen Jones, Ruabon	£1,891 14 6
Robt. Hopley, Cefn, Ruabon	1,750 0 0
A. Roper, Wellington	1,710 0 0
J. Gethin, Shrewsbury	1,688 0 0
W. Samuels, Wrexham	1,640 0 0
JENKINS & JONES, Johnstown, Ruabon (accepted)	1,560 0 0
Bradney & Lloyd, Shifnal	1,475 0 0

SEACOMBE.

For Construction of Shelter, Passenger Landing Stage, Seacombe. Mr. ARTHUR SALMON, Engineer.	
Raffle & Campbell, Liverpool	£492 19 0

WATERFOOT.

For New Club Premises at Waterfoot, for the Waterfoot Liberal Club.	
J. GREENWOOD, Bacup (accepted)	£2,220 0 0

WEST LULWORTH.

For Building House and Shop at West Lulworth.	
D. Hitchin, Parkstone	£1,133 0 0
J. Miller, Osmington	1,025 0 0

WOKING.

For Proposed Alterations and Additions to Messrs. Knight & Littleboy's Premises, Woking, for Mr. William Wells.	
Mr. A. J. STURGES, Architect, High Street Chambers, Guildford.	
Higlett & Hammond, Guildford	£502 0 0
P. C. May, Guildford	476 0 0
Stanley Ellis, Guildford	454 0 0
James Whitburn, Woking	415 0 0
HARRIS & SON, Woking (accepted)	399 0 0
For New Stabling and Store, Woking, for the Friary, Holroyd's and Healy's Brewery Co., Ltd. Mr. A. J. STURGES, Architect and Surveyor, High Street Chambers, Guildford.	
Higlett & Hammond, Guildford	£497 0 0
P. C. May, Guildford	485 0 0
Stanley Ellis, Guildford	447 0 0
HARRIS & SON, Woking (accepted)	345 0 0

ILLUSTRATIONS.

DESIGN FOR A ROMAN CATHOLIC CATHEDRAL.

ELEVATION OF PROPOSED CHAMBER OF COMMERCE, LONDON.

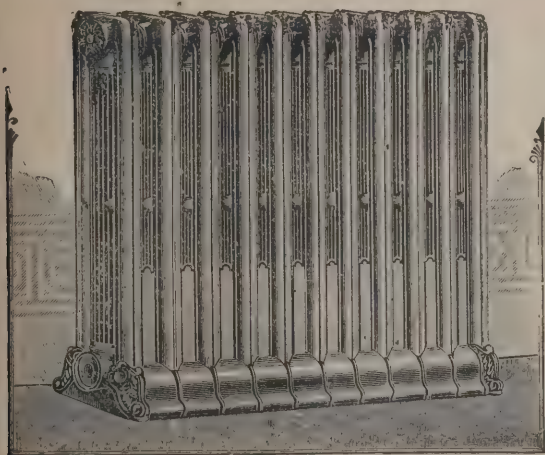
THE NORTH PORCH, AUDLEY END, ESSEX.

TRADE NOTES.

THE new building of residential flats, Wellington Court, Knightsbridge, with an unsurpassed view of Hyde Park and Rotten Row, was on Tuesday afternoon opened for letting by the directors. After the building (which is very attractive and highly decorated, and fitted with all the latest improvements) had been inspected, a test was made of the passenger lifts, to demonstrate their safety in working. These lifts have been erected by Messrs. R. Waygood & Co., Limited, upon the patent safety principle adopted by them. The cars are suspended by four steel wire ropes, the failure of any one causing the cams or grippers to be pulled into action by the remaining sound ropes. There is also a fifth rope of lighter make which runs idle, and whose only duty is to pull the cams into action in the highly improbable event of all the four lifting ropes breaking simultaneously without first having brought the safety apparatus into action. The apparatus was tested by the severing of one of the ropes at the most trying place (near its anchorage), while Mr. Walker, Chairman of Directors of Messrs. R. Waygood & Co., Limited, was in the cage, which was instantly stopped by the cams gripping the timbers at the back of the girders, erected for that purpose.

THE contract has been let for the erection of the tower of St. Bartholomew's Church, Nelson Street, Bolton, and the constructive work will be commenced at an early date. The new structure, along with a peal of bells, is being provided through the bequest of the late Rev. R. Loxham, who, with his brother, the Rev. T. Loxham, of Great Lever, had always evinced a deep interest in St. Bartholomew's parish. The tower will occupy a position at the north-east angle of the nave of the church, will harmonise in its design with the present building, and will be a conspicuous object as seen from the principal streets in the locality. Mr. Freeman is the architect.

AT the Holborn Restaurant an innovation from New York has just been introduced in the shape of a lady type-writer



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TRAVAUX D'ARCHITECTURE EXECUTÉS EN BELGIQUE, or ARCHITECTURAL WORKS EXECUTED IN BELGIUM, by HENRY BEYAERT, Architect. This work contains the most interesting productions of Henry Beyaert, and presents, with fullest details, his principal edifices. It is the reproduction of his own designs arranged by himself. Each construction is explained by plans, details, elevations, sections, &c., drawn to scale. The work will be published in twenty to twenty-five parts, consisting of ten folio plates each, appearing quarterly. Thirteen parts are already out. Subscriptions are received for the entire work only. Price per part, 12s.

L'EMULATION.

A MONTHLY JOURNAL. ORGAN OF THE "SOCIÉTÉ CENTRALE D'ARCHITECTURE" OF BELGIUM.

The third year of the New Series (1893) is in preparation, and will form the eighteenth year of the Collection. Each number consists of four or five folio plates, eight pages of text, and a supplement of twelve pages. It produces in chromolithography, héliogravure, phototype, etching, &c., prominent examples of ancient and current architecture, and the text is devoted to this profession. The Supplement contains articles pertinent to architecture, and advertisements. Subscriptions date from January 1. Price per year, £1 8s. The whole year, when complete, in portfolio, £1 12s.

E. LYON-CLAESEN, ART PUBLISHER, BRUSSELS (BELGIUM).

stationed in the vestibule, who is prepared to take down in shorthand and instantly transcribe for signature the letters of hurrying guests. In the American hotels not only business and social letters, but offers of marriage are frequently transmitted by this method—the shorthand notes, in the case of very private communications, being returned to the dictator if desired.

THE *Carlisle Journal* is informed on reliable authority that the new steelworks at Maryport started a few years ago by Messrs. Hampton & Facer, on the site of the Ellen Rolling Mills, have been transferred from Captain Robinson, of Workington, to a number of Maryport gentlemen who are anxious to resuscitate the industry. On Saturday a meeting of the new proprietors was held at Maryport, when the prospects of the venture were talked over and some details of a private nature arranged. So far, no scheme for restarting the works has been adopted.

THE building committee appointed to promote the erection of a new residence for the vicar of Holy Trinity, Birchfield, the Rev. W. F. Bradley, have accepted the contract of Mr. G. Trentham at 1,644/. The building will be commenced at once under the superintendence of the architect, Mr. R. Matthews. Mr. Trentham lately completed the new rectory house at Handsworth, and is also engaged in building the vicarage at Selly Hill.

THE Farnworth Fever Hospital, Bolton, is being warmed and ventilated by means of Shorland's patent Manchester stoves, with descending smoke-flues and patent Manchester grates, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

AT the monthly meeting of the North Staffordshire Mining Institute, Stoke-on-Trent, Mr. E. B. Wain presiding, Messrs. H. I. Williams & Co., Fenton, exhibited a patent corrugated iron pit tub, which was stated to be lighter and stronger than ordinary tubs.

THE Acme Wood Flooring Company, Limited, write:—We have much pleasure in announcing the completion of and removal to our new saw mills and manufactory, situated on the River Lee Navigation, extensively fitted with the most modern machinery to meet the growing demand for our patent "im-movable Acme" flooring, and to supply wood block flooring and paving of every description prepared ready or laid complete at low prices, to compete with a department of trade now monopolised by foreign manufactured material.

THE works committee of Dundee Town Council have accepted the contract of Mr. Robert Sheach, jun., amounting to 1,192l. 10s., for laying the causeways between the tramway rails in Victoria Road, Dens Road and Dura Street.

BUILDING AND BUILDERS.

THE *Birmingham Post* says:—We regret to hear of the death of Mr. Robert William Fitzmaurice, which took place on Friday, the 10th inst., at his residence, 16 York Road, Edgbaston. The deceased gentleman was sixty-four years of age, and for the greater portion of his life he was actively engaged in business associations which made him one of the best-known citizens of Birmingham. He served his articles with Mr. Pigott Smith, the first borough surveyor of Birmingham—a man who did so much to start and give impetus to the improvement of the town. Through his profession few men watched with more interest than Mr. Fitzmaurice the gradual development of the city, and after he became a member of the firm of Jones & Fitzmaurice, contractors, his connection with the improvements of Birmingham took a very practical form. The firm carried out most of the important works, notably the main conduit of the sewage outfall at Salfley, the formation and making of Corporation Street, and the first laying of considerable portions of the tramway system within the borough. The firm also laid large quantities of footway and carriage-way pavements in the city, and recently they undertook for the Corporation and the Aston District Council the improvement of the lower portion of the Hockley and Aston Brook, and the construction of a storm-relief conduit between Summer Hill Street and Morville Street.

PLANS have been approved for the erection of a new Roman Catholic Church at Westthoughton. The plans were prepared by Mr. Thomas Burgess, architect, of Haigh, near Wigan.

AT the meeting of the Walsall Town Council the health committee reported, amongst other matters, that a house-to-house inspection of 1,276 houses, in certain specified streets, had been made, and that they had rescinded their previous resolution in favour of the provision of a hospital for the treatment of smallpox patients only, and had instructed the borough surveyor to submit fresh plans for an isolation hospital, showing what buildings could be provided for 3,000l., exclusive of a boundary wall.

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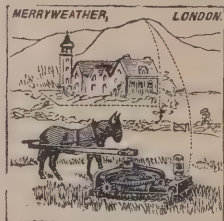
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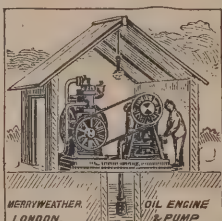
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"WATER SUPPLY TO MANSIONS."

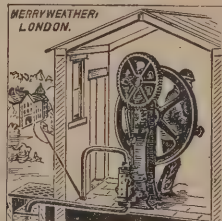
The "Times" says:—"A Practical Pamphlet."



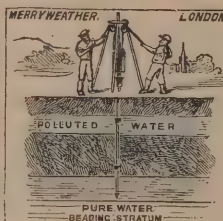
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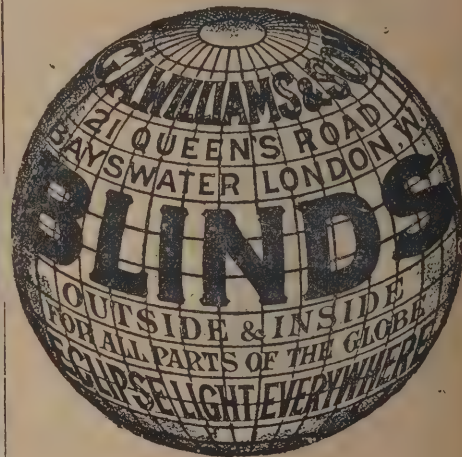


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CASES FOR BINDING THE ARCHITECT.

PRICE TWO SHILLINGS.

OFFICE: 175 STRAND LONDON, W.C.

At a meeting held in Brechin a letter was read from the trustees of the late Rev. Alexander Gardner, of Brechin, who by his will directed the larger portion of his estate to be devoted to the endowment of a new church and benefice in Brechin, intimating that two friends of the late Mr. Gardner had signified their desire to take advantage of the opportunity afforded them to give a donation of 7,000*l.* towards the erection of a church, vestry and hall, and for providing in due time a suitable manse for the minister of the new church.

GOVANHAUGH Paper Mill, Pollokshaws, has been completely destroyed by fire. The loss is estimated at 5,000*l.*

At Dundee, Mr. George Henderson, of Perth, has been appointed clerk of works at the Municipal Buildings, Dundee. The remuneration to Mr. A. Grainger Heiton, architect, for his services in connection with the restoration of the Municipal Buildings has been fixed at 3½ per cent. on the ultimate cost of the work. The following dates have been fixed for completing the various departments of the work, under penalties for failure:—Mason, August 1; joiner for roof, August 17; slater and plumber, September 1; plasterer, October 12; joiner fittings, &c., November 9; and painter, November 30.

THE erection of new buildings of a total value of 12,000*l.* has been sanctioned by the plans committee of the Aberdeen Town Council. The plans included thirteen dwelling-houses, and the extension of the Ice Company's premises at a cost of 2,000*l.*

THE report of Major Marindin on the recent collapse of Guildford Tunnel has been issued. He attributes the accident mainly to pieces of wood used for supporting the arch in course of construction and built into the brickwork, where they had rotted. Where they were built in, the thickness and strength of the brickwork were reduced; but a worse effect of these rotten pieces of wood would be the channels thus formed for percolation of water. Major Marindin has little doubt that the fall of the tunnel was due to a cavity hollowed by the action of water, probably at one of the branches. As this cavity increased in size the arch became so unevenly weighted that it collapsed.

ON Tuesday at the West Bromwich County Court, before Judge Griffiths, S. C. Wood, brick manufacturer, West Bromwich, sued Webb & Co., Newton Street, Birmingham, builders, to recover 30*l.* 8*s.* for bricks delivered. The defendants counter-claimed for 80*l.* damages for alleged breach of contract by failure to deliver the bricks. After a protracted hearing

judgment was given for plaintiff for 22*l.* and costs, the counter-claim being dismissed with costs.

THE Aberdeen University Court on Tuesday decided that the completion of the south wing of Marischal College is to be proceeded with, leaving the central detached building to be afterwards undertaken. The Marquis of Huntly stated that it was not improbable that application would be made to the Government for a further grant of 10,000*l.* To finish the scheme in its entirety will require 35,000*l.*

MR. ALBERT MURRAY, of Dublin, has prepared plans for the small cottage hospital which is to be erected near Bray as a Hely memorial.

THE Manchester Ship Canal Warehousing Company have purchased a large area as sites for buildings, and will at once commence with warehouses which will cost nearly 100,000*l.*

IT is proposed to expend 5,500*l.* in providing a hop market and the necessary warehouses at Hereford. A building in Broad Street has been provisionally purchased at 4,000*l.*, and it is intended to lay out another 1,500*l.* in making the required alterations and additions. The Town Council also intend expending 3,000*l.* in improving the water supply, making improvements in connection with the waterworks and laying down new mains. The old mains generally were laid about forty years ago, and the late prolonged frost caused much havoc.

DURING a gale at St. Helens on Wednesday morning a brick chimney, 100 feet in height, at Hardshaw Brook Chemical Works, was blown down. The pile fell in a direction from the adjoining buildings, and no one was injured.

ELECTRICAL.

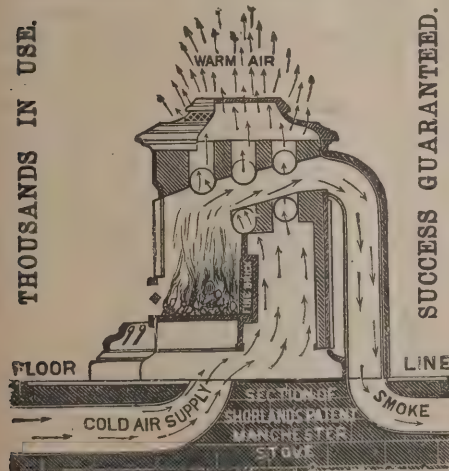
At the meeting of the special lighting committee of the Liverpool City Council on Monday, satisfactory reports on the condition of the plant and property of the Electric Supply Company, Limited, in view of the proposed purchase by the Corporation, were presented from Sir Frederick Bramwell and the city auditor, and a draft agreement for the purchase at the total cost of 400,000*l.* was adopted.

THE Mersey Railway Bill, authorising the use by the company of electricity as a motive power, has been passed by the House of Lords committee.

THE lighting of Perth Waterworks by electricity was inaugurated on Monday night.

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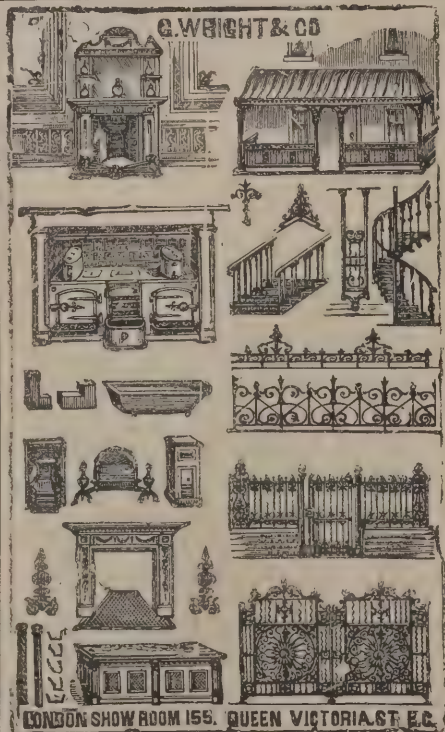
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THE sub-committee of the Bolton Town Council have received tenders for supplying and laying electric mains in Spa Road, Marsden Road, St. George's Road, Higher Bridge Street, Halliwell Road, Moor Lane and Derby Street, and they were referred to Alderman Miles, Councillor W. Cooper and the engineer for inquiry and report. The engineer submitted a tabulated list and analysis of the tenders for the supply of engine and alternators in the extension of the electricity plant. The tender of Mr. S. de Frante, London, for the supply of the alternator was accepted, as was also that of Messrs. Hick, Hargreaves & Co. for the engine, subject to certain details being carried out to satisfy the engineer. A communication was read from the Local Government Board stating that in reference to the application of the Corporation for the sanction of the Board for the borough to borrow 17,300*l.* for electric purposes, they intended to hold a local inquiry on the subject.

THE question of illuminating the churches by electricity is being discussed in Rome, and it is believed that this method will be allowed, except on the altars, which, as before, will only be lighted by wax candles or lamps with olive oil.

AT the monthly meeting of the Rhyl Urban District Council, Captain E. W. Keatinge, J.P., presiding, it was reported with regard to the new marine lake that the water would first be let in on the 24th inst. An application was received from a Birmingham firm asking for permission to construct an electric railway between Rhyl and Prestatyn, which is under consideration.

VARIETIES.

THE Eastbourne Town Council have obtained the sanction of the Local Government Board to borrow 77,000*l.* for drainage works, of which Mr. Henry Law is the engineer.

THREE French contractors have been raised from the rank of chevalier to that of officer of the Legion of Honour, viz. M. J. Claret, of Lyons; M. F. Bertrand, of Paris; and M. P. Hersent, of Paris. M. Many, another contractor, has been nominated a chevalier.

AT a special meeting of the Durham City Council the plans were considered for sewerage the city and the construction of sewage purification outfall works. The first premium was awarded to Messrs. Lomax & Lomax, Manchester, Mr. D. Balfour being awarded the second premium.

SANCTION has been obtained by the Westhoughton Burial Board to borrow 2,000*l.* for extension of the present cemetery.

THE Berlin correspondent of the *Standard* says:—The problem of employing spirits for lighting on a new principle, similar to the incandescent gas light, has been solved with great success by a Berlin firm. Experiments have just been carried out in presence of the Prussian Ministers, Herren Berlepsch, Miquel and Hammerstein, which are reported to have been completely satisfactory. If this news is confirmed, it is likely to prove of enormous importance to the German spirit industry, which has recently been in *extremis*.

THE *Manchester Guardian* says that the waterworks committee are appealing to the citizens to be economical in the use of water. The engineer has reported an increase in the consumption as compared with last year of over four and a half million gallons per day, and he is of opinion "either that there is considerable waste or an unnecessary use" of water now taking place. He warns the committee that if the increase continues for any length of time they will find themselves in a very difficult position.

DAMAGE, estimated at 2,000*l.*, has been done by a fire at the pottery works of Messrs. Wood & Hulme, Burslem. Upwards of a hundred persons will be thrown out of work by reason of the fire.

THE London and North-Western Railway Company, it is stated, have purchased some thirty acres of land at Flint, abutting on the Chester and Holyhead Railway, for the purpose of developing their property and erecting cottages for workmen.

THE *Irish Times* says:—Three important railway officials from South Africa are on a visit to Ireland inquiring into the working of different systems of light railway in this country, with a view to the introduction of similar lines into South Africa. Within the past few days they have been examining into the light railways in Kerry and observing the working arrangements of the lines in that county. They went to Cork subsequently, and inspected the Cork and Muskerry line, which is admittedly one of the most successful systems of its kind in Ireland. On their trip over the Cork and Muskerry line they were accompanied by the manager, Mr. J. B. Wilson. The visitors when they have duly inspected all the different systems of light railways in Ireland will fully report to their Government on the merits of the lines of light railways in this country.

AWARDS OBTAINED: LONDON, 1862, 1874; PARIS, 1867, 1878; CHICAGO, 1893.

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VOL. LII. OF THE ARCHITECT.
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AN experiment in acoustics was tried in Philadelphia on Monday in the Baptist Temple, the largest church building in Philadelphia. The temple has two auditoriums, one on the lower floor, the second on the one above, where there are besides several smaller meeting-rooms. These were all connected one with another and with a gigantic telephone by means of wires. The service, the sermon and the music were all produced in one room, where the large telephone stood near the pulpit and the organ. A large transmitter was placed in each of the other rooms, so that the sermon, service and hymns were distinctly audible and intelligible to the crowded audiences that filled the other auditorium and the meeting-rooms.

ON Wednesday, at the Lambeth Police Court, Mr. John Pullen, the owner of property in Manor Place, Walworth, known as Pullen's Buildings, appeared to an adjourned summons taken out by the Newington Vestry, who complained that certain sanitary defects existed at the premises, which are let out in tenements. Mr. Hopkins, the magistrate, said he had had the advantage of seeing the premises. The Vestry were, in fact, attacking the system of drainage in these premises, which was admittedly not such as would satisfy the new by-laws of the County Council. In his view, the first thing the Vestry had to do was to show that the premises were in such a state as to be a nuisance and dangerous to health. He had come to the conclusion that at no time were the premises in such a state as to be a nuisance or dangerous to health, and he should therefore dismiss the summons.

AT the meeting of the Stratford-on-Avon Town Council, it was resolved on the recommendations of the joint hospitals committee, to admit pauper smallpox patients, who would otherwise have to be treated at the workhouse, upon the guardians agreeing to pay the committee the actual costs incurred by them. It was stated the erection of the hospital was one of the best investments ever made by the town. It was resolved to build a porter's cottage in connection with the hospital at a cost of 350/.

A FIRE occurred at the Anaglypta Paper Mill, Darwen, on Monday evening, and damage amounting to about 2,000/ was done. The fire originated from an unknown cause in the eighth storey of the building. The premises were soon gutted and valuable machinery destroyed.

THE Stamford Town Council has received from Mr. G. H. Hill, C.E., of Manchester, a report on the water supply of the town. He recommends the adoption of a scheme for obtaining water from Braceborough, near Bourne, about ten miles away, a scheme which was also recommended some years ago by the late Mr. Hawkesley.

AT the meeting of Langholm police commissioners, a letter was read from Mr. Carthew Yorstoun, chamberlain to the Duke of Buccleuch, enclosing a deed of conveyance by which his Grace handed over to the commissioners as a free gift the Town Hall of Langholm and the ground it is built on, the only condition being that it should be used for the public benefit. The building is to be handed over at Whitsunday first.

THE Uckfield Water Company have decided on a scheme for the construction of a storage reservoir at their pumping station, for which tenders are invited. Mr. J. Lewis, of Shoreham, is the engineer.

A COOKERY SCHOOL is about to be erected in Elm Grove, Brighton, by the School Board.

A SWEDISH collector, the late Carl Dahlgren, of Stockholm, has left the National Museum in that city 432 watches and clocks, 1,121 boxes, and 4,435 miniature paintings. A provincial museum receives 1,920 pictures. The Dahlgren collection numbered about 10,000 objects, stored away in six rooms, affording an extraordinarily ingenious use of the space. The very bed curtains were thickly sewn with watches and miniatures.

NEW CATALOGUES.

A LARGE and bulky catalogue containing about 100 pages has been issued by Messrs. Doulton & Co., of Lambeth. In publishing a new edition of their sanitary catalogue, Messrs. Doulton & Co. say that they have endeavoured to embrace all the designs approved by the leading authorities, and at the same time to meet the demand for really effective appliances combined with artistic decoration. To attain these ends Messrs. Doulton have constructed additional works and foundries at Paisley, so that in conjunction with their several potteries and art studios in Lambeth and Staffordshire they have under their own control the whole of the manufacture and finish of the different fittings, and thus are in an exceptional position to execute with despatch orders from their own patterns, as well as being in an absolutely unique position for carrying out special designs submitted to them. At the outset the eye is caught by the carefully compiled and classified index, which by itself covers twelve pages. The first section which follows is devoted to "Closets, cisterns and fittings." Many of the illustrations are excellently reproduced in colours,

which are of use in enabling any person to judge of the effect of the articles *in situ*, with tile or other wall decorations, &c. An excellent pattern of Doulton's improved cast-iron shelters for trough closets is illustrated, being a very useful appliance at factories for closets and urinals when detached from the main building; also plumber's brasswork and effectively designed tilework. The "Metallo-Keramic" joint is particularly deserving of attention. The great merit and novelty of this joint is that it insures a perfect junction between the pottery trap of the closet and the lead soil-pipe. Many trials have been made in this direction, but have hitherto failed, and this is the first time that complete success has been attained, owing to the perseverance of Messrs. Doulton. The thorough incorporation of the two materials, which render entrance of sewer-gas to a house impossible, is got by a special and patented process. The illustrations and description will be found on pages 2, 3 and 4. After thorough and exhaustive tests it took the only medal at the Sanitary Congress, Liverpool, 1894. Other important additions and improvements will be found in this section. The last issued catalogue was dated 1890. The glazed and enamelled tilework for wall-linings give an excellent idea of the work that may any day be seen at Messrs. Doulton's showrooms. Another section deals with "Baths and fittings, plunge, spray and shower," as manufactured at their Paisley works. Special attention may be directed to their wide rolled edge cast-iron baths, both in metallic and glass and porcelain enamels, all excellent in quality and finish. The designs for bath decoration are another praiseworthy feature of the catalogue. Nearly every known kind of bath is illustrated. The next section is devoted to "Lavatories and fittings," and another section to "Automatic flushing tanks, flushing syphons, manhole covers, &c." These lists have been carefully revised, and many important and new additions appear. The section for "Urinals and fittings" contains a great variety of appliances, from simple and cheap to the best and latest form of glazed white and decorated backs and bases. An automatic and perfect flush is provided for the urinals, and the periodical discharge can be regulated as to time. They are especially suitable for public buildings. We have now done as much justice as possible in the short space at disposal as the exhaustive nature of the catalogue will permit of, and while recommending it to our readers we would advise those who have the opportunity to visit the showrooms of Messrs. Doulton, on the Albert Embankment, and examine the immense display of useful and beautiful appliances to be seen there. It may be mentioned in conclusion that new methods are invented from time to time and improvements developed, and therefore at the end of each section slips are provided to which new sheets as they appear can be attached.

CHICHESTER DRAINAGE WORKS.

AT the last meeting of the drainage committee of Chichester the following letter, written from Mr. Baldwin Latham (the engineer) to Mr. Peters (the contractor), was submitted, and the committee recommended the Council to assent to the course proposed to be taken by Mr. Latham:—

May 1, 1895.

Dear Sir,—Having regard to the extraordinary delays which have taken place with reference to the non-fulfilment of your promises with regard to the removal of the stoppage from the sewer between M and M2, I have to inform you that if this stoppage is not cleared within a week from the present date, or some satisfactory method adopted for dealing with the matter, I shall apply to the Urban Sanitary Authority for power to give you notice to take the whole of this portion of the work out of your hands, and employ some competent person to complete the same, and the cost thereof will have to be borne by you.—Faithfully yours,

(Signed) BALDWIN LATHAM.

P. Peters, Esq., Contractor, East Street, Horsham.

The committee considered Mr. Peters's application for an extension of the time for the completion of his contract, but were not prepared to recommend the Council to extend the time within which the contractor is to complete his work, and that he be informed that the Council have decided to waive none of the penal clauses against him, but that expedition on his part now may be taken into favourable consideration by the Council hereafter, provided that it be understood that this resolution shall not prejudice the previous resolution. At a further meeting of the committee on May 10 the following letter from Mr. Baldwin Latham was read:—

"Dear Sir,—I regret to have to state that, after having given Mr. Peters repeated notice respecting the removal of the stoppage from the sewer in the fields between the letters M and M2, and he having repeatedly promised me that this stoppage should be removed without any delay, yet, after many months, matters remain exactly as they were. On the 1st of this month I gave him notice that, unless within

seven days the stoppage was removed, I should make an application to the Corporation of Chichester, under the provision of clause 6 of the specification, to be allowed to take this part of the work out of the hands of Mr. Peters, and employ some other person to do it. In consequence, therefore, of the many months' delay in this matter, and nothing having been satisfactorily done, I request the Corporation of Chichester to authorise me to take this portion of the works out of Mr. Peters's hands and employ some other person to do it. I enclose you a certificate for 810*l.* in favour of Mr. Peters, and I have forwarded the usual monthly accounts to the city accountant, but I must request you to withhold the certificates under clause 80 of the specification, as I have given Mr. Peters notice that I shall withhold this until I am satisfied he is making progress with the remedying of the defective works, which will cost a considerable sum to rectify, and which up to the present time he has not done.—Faithfully yours,

BALDWIN LATHAM.

Edwin Arnold, Esq., town clerk, Chichester.

It was resolved that the certificate for 810*l.* be withheld accordingly.

SPURN LIGHTHOUSE.

THE old lighthouse at Spurn, which has befriended the mariner for twenty years more than a century, will soon be superseded by an entirely new structure, in the erection of which upwards of 300,000 Staffordshire bricks have been used. The new house will be supplied with a triple light. The old lighthouse, associated with the great engineer, Smeaton, was commenced in 1771, and completed in 1773. In the sixth year of George III an Act was passed for taking down and rebuilding the lighthouses then existing at Spurn, one to be 50 feet and the other 90 feet high. The lighthouse at present in use is called the "high" lighthouse; the "low" light was destroyed in 1776, and again in 1786, after being rebuilt by Smeaton. It succumbed subsequently to the fury of the sea on three occasions, the last in 1830, and was never again upreared. The "high" light is a circular tower, with several storeys. Smeaton himself, writing of the two lighthouses in 1793, says, "I had the great satisfaction to find at Hull that the Spurn lights were in such credit among the seamen that they were both esteemed, on account of their clear and brilliant light, to be the best lights in Europe. Frequently the great light of the Spurn has been seen in clear weather from the high ground near Beverley, a distance of

thirty miles." The first lighthouse erected at Spurn of which there is any record was constructed by a hermit in the reign of Henry IV., and to assist the hermit in his laudable work a duty of 1*s.* was levied on every ship of 120 tons and upwards, 8*d.* on every vessel of 100 tons, and 4*d.* on every vessel of a less burden, coming from the sea into the Humber, which rates were to be received by the Mayor of Hull, for ten years from the date of the patent (1428).

THE PROGRESS OF THE IRON AND STEEL INDUSTRIES.

AN address was delivered by Mr. David Dale, as president of the Iron and Steel Institute, at the annual meeting on the 9th inst. He reviewed the changes which had taken place, and the progress made in the iron and steel industries since the formation of the Institute in 1869. Although much of the work of technical instruction throughout Great Britain was at present necessarily of a somewhat tentative character, yet a great deal of good work was already being done, and it might be said to-day that, in all our principal manufacturing towns, sound instruction in the physical sciences, and their applications to particular industries, had been brought to the door of our workers at little more than a nominal charge. It was as yet too early to reap to any appreciable extent the benefit of this change of state of things, but it was something to know that large numbers of our apprentices and younger workmen were availing themselves of the facilities placed within their reach, and we might confidently hope that a few years would now bring forth marked results in the added intelligence which would be brought to bear upon all our varied industrial occupations, and also that the general effect of wider intellectual interests would, unless counteracted by other influences, tend more and more to the development of that spirit of reasonableness which was such an important desideratum in the relations of labour and capital. In making a comparison between the present and the past of twenty-five years ago, it had seemed fitting to dwell a little upon the training of the worker as being a not less important element in the question of successful production than the nature of our iron ores, the perfection of our machinery, or the facilities of our transport system, seeing that the elimination of ignorance and unreasonableness was no less a factor in the problem than the removal of phosphorus from steel or the impurities from fuel, and was of value even from a purely utilitarian and commercial point of view. The labour difficul-



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ties, which were such a serious hindrance to the steady conduct of the trade, were still with us from time to time, and, in their most serious developments, owing to the more complete organisation of labour, even at times assumed the proportions of an industrial war, ruinous alike to masters and men. They could not, however, but note with satisfaction the large extent to which, pre-eminently in their own particular trades, the principles of conciliation and arbitration had replaced the more barbarous methods of brute force, and through their present application had been the means of averting many a disastrous conflict. The North of England Board of Conciliation for the manufactured iron and steel trades was formed in the year 1869, and since then almost every point of difference which had arisen had been peaceably settled through its agency. The application of the system of conciliation and arbitration on such a large scale as was incident to a great industry like that of the northern iron and steel trades gave a great impetus to its widespread adoption, not only in trades allied to these, but in connection with most of the leading industries of the country, whilst frequent inquiries as to our methods from foreign correspondents testified to a growing appreciation of these principles in the other great manufacturing countries of the world. Mr. Dale pointed out that whereas in 1879 88 per cent. of the total tonnage of ships was of iron, the tonnage of steel had now risen to over 96 per cent. of the output. Then steel plates cost 18*l.* to 20*l.* per ton, whilst to-day they could be bought for 4*l.* 15*s.*, a parallel declension having also taken place in the price of steel rails. To what was this contrast between the values of the present time and of twenty-five years ago due? How much of the difference could be credited to improved methods of manufacture, and how much to other causes affecting the course of trade? Before attempting any answer to this question, the President passed in rapid review the history of the more important processes which have come to the front during that period—the Bessemer, the Siemens, the Siemens-Martin, the Gilchrist Basic Bessemer process, and the like—including a reference to the labours of Sir Isaac Lowthian Bell in connection with the theory and practice of blasting, also going very largely into statistics. As to the output of pig-iron, the percentage of increase in the United States on the output of 1869 was no less than 435 per cent., whilst in England it had only increased 23 per cent. The percentage of increase in Germany was 249, in Austro-Hungary 132, in Russia 162, Sweden 66, France 46 and Belgium 41. As to steel the percentages of increase in the

steel-making countries was very marked. The United States showed the remarkable advance of 13,236 per cent., the United Kingdom 979 per cent., Germany 1,511, Austro-Hungary 1,500, Belgium 886, Sweden 1,109 and Russia 4,136. A remarkable feature, and one deserving the most careful consideration from the point of view of our home industries, was the constantly increasing proportion of pig-iron ore used in the production of our pig-iron to that which was raised in many instances within a few miles of our blast furnaces, despite the successful establishment of the basic process, which solved the production of steel of high quality from phosphoric ores such as that of Cleveland. In 1880-82 the quantity of ore raised in the United Kingdom showed an increase of 36 per cent. on that of 1869, whereas in 1893 we actually raised 300,000 tons less than in that year, and at the same time were importing a quantity closely approximating to our principal ore district, and representing a money value of over 2,000,000*l.* sterling, which would otherwise be circulating in the form of wages in our own country. This state of things was likely to continue, so long as it paid better to convert foreign ore by the acid Bessemer open processes than Cleveland ore by the basic, and relief could only be looked for in the direction of further improvements tending to increased economy in the basic process, unless the foreign ore should rise to a point at which our native ore could successfully compete with it, which might afford some satisfaction to the English mineowner, but at the price of an increased average cost of our total output of steel. The present was a time of phenomenal cheapness in all productions, and men were beginning to ask, with the late president, Mr. Windsor Richards, "Of what use is it to construct labour-saving machinery, and so throw more men out of employment, when we have already thousands of willing hands out of work, when every improvement is at once adopted by our competitors, and every increase of technical knowledge only seems to open out new sources of competition?" The process, however, under the present condition of trade seemed to the President to be inevitable. The severer the competition the less could we afford to neglect any means by which excellence of quality and economy of production could be secured. As in the organic, so in the commercial world, the process of natural selection and the survival of the fittest was ever going on. The operation of the inevitable and inexorable law would ever tend to eliminate the less favourably situated, and to concentrate production in the hands of those vast concerns whose resources were such as to enable them

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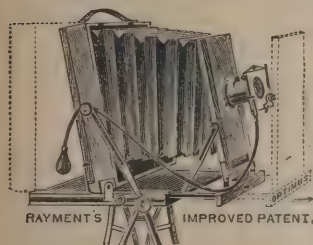
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to maintain the struggle in exceptionally hard times, as well as to avail themselves of every improvement in processes of manufacture, upon the adoption of which their continued existence would depend, and which were denied to their less favoured competitor. In ordinary times practically the whole of the proceeds of manufacturing operations tend more and more to go into the pockets of the worker. It was right that labour should have its fair share of remuneration, but any artificial restraints in the law of supply and demand, whether in the form of shorter hours of labour or otherwise, must enhance the cost of production. If the result of fixing a minimum wage was to impose a cost of production which could not compete with the cheaper labour of foreign countries, wages must eventually come down. But of all the mad and fatal expedients for driving away trade, none were so mad and fatal as the gigantic and prolonged strikes which from time to time disfigured the face of our industrial records. Never in the history of the world was there so much accumulated capital waiting for employment, but owing to the unstable conditions of industrial enterprise capitalists at the present time preferred securities yielding 2 or 3 per cent., where there was some assurance of stability, to the more precarious trade investments which had ceased to offer the possibility of a return commensurate with the greater risk which they involved. The State had legitimate functions to fulfil in fostering the trade on which the empire depended; but State action would more profitably be directed to the opening out of more extended fields of enterprise throughout the empire than imposing regulations which tended to enhance the cost and restrict the operations of our home industries. What might be the effect of opening up the markets of the world by events now passing in the East no one could tell. The Japanese asserted that in five years they would be the largest exporting country in the world, their programme being to exercise their unsurpassed imitative faculty in reproducing the various manufactures of the world by aid of their cheap native labour, which they thought would enable them to undersell the nations of the West. The question was to whom would be the spoils of industrial conquest. The figures he had quoted, even if they did not supply any very definite or satisfactory solution of the problem, might at any rate supply food for thought, indicating as they did a state of things which was sufficiently critical to point the moral that neither capital nor labour could afford to do anything to hamper the cordial co-operation by which alone the prosperity and well-being of the community could be secured.

SOUTHPORT PIER.

ON the 10th inst. in the Nisi Prius Court, Liverpool Assizes, before Mr. Justice Kennedy and a special jury, an action was brought by the Southport Pier Company, Limited, to recover 500*l* from the Southport Corporation in respect of damage to their pier, alleged to have been caused by trespass by the defendants. The defence was a denial of trespass.

Counsel said that the damage was done by reason of a large quantity of sea water which was collected upon the Southport shore during the execution of certain works by the Corporation, and which was allowed to escape with very great violence on the night of December 13. Many years ago the Pier Company erected a long pier for the accommodation of visitors. In 1892 the Corporation constructed a circular marine drive at the Birkdale side of the shore. The effect of the work was to enclose a considerable area, as it were, within three walls, and the water that collected in that area caused the damage complained of. The Corporation had evidently contemplated that water would collect there, for they put in two culverts to carry it off. On the evening of December 13 the pier was left in a perfectly sound condition. During the night there was an unusually high tide, and about five o'clock in the morning some fishermen going along the pier to their boats heard a great rushing of water, accompanied by a cracking noise. Subsequently it was discovered that the sand had been washed away to a depth of 18 feet by the tremendous scour of water which had taken place; the iron piles of the pier, which had been driven into the sand to a depth of 10 feet, were left dangling in the air, their points being 3 feet from the sand, while the girders overhead had sunk 5 feet below the level. The defence of the Corporation was that the culverts had been duly closed on the preceding night and must have been opened by someone not connected with the Corporation. The Pier Company, on the contrary, would prove that the culverts had been left open. If the Corporation had laid the culverts down to low-water mark, as they had done in the case of the marine lakes, the casualty would not have happened. In addition to damages, therefore, the plaintiffs asked for an order requiring the defendants to carry the culverts down to low-water mark. It was denied that the pier was in a rotten condition, as alleged by the defendants.

Counsel for the Corporation said that the defence was that the damage had been caused by the scour of the tide about the

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bases of the pier piles, which carried away the protecting stones. Evidence was given that early on the morning of December 13 a large quantity of water was seen escaping from the culverts, uniting into one stream, and rushing with great force under the pier where the breakdown took place. The superintendent of the pier described the effects of the removal of the sand on the pier, which had sunk 5 feet. He had known the pier for thirteen years, and he would not admit that there had been difficulty for some years in contending against the excessive scour of the tide. Occasionally 200 or 300 tons of stone had been put down to protect the piles. It was not true that the "bog-hole" had been extending landwards rapidly every year, but it had come in a little. Witness was further examined as to periodical expenditure by the company to counteract the effect of the tide, as shown by the company's annual reports.

Mr. Robert Watson, chairman of the company, said that the channel formed by the water escaping from the culverts was wider and deeper than an ordinary canal, and he had no doubt that this caused the damage. Mr. John Sutton, architect and surveyor, gave a similar opinion. Mr. John Brunlees, consulting engineer to the Pier Company, corroborated, and said that in 1892 he recommended the expenditure of 9,500*l.* upon the pier, but only 6,000*l.* was spent. The stonework he recommended for levelling purposes was not carried out, but the state of the stonework had nothing to do with the damage to the pier. To prevent a recurrence of the accident the culverts ought to be extended to the low-water line. Sir George Bruce, past president of the Institute of Civil Engineers, said that after a lengthy investigation of the matter he had come to the conclusion that the damage had been caused by the rush of water from the culverts. Mr. James Abernethy, also a past president of the Institute, corroborated.

For the defence it was contended that there was no doubt that water did come from the 24-inch culverts, but it was impossible that that could have made a hole 10 feet deep under the pier at a distance of a quarter of a mile from the culverts. The damage to the pier had been caused by the action of the tide, and this view was strengthened by the previous experiences of the company.

Lieutenant Sweeney, marine surveyor, deposed that on the night in question the tide at Southport was 28 feet high. That was not extraordinarily high. Thomas Rimmer, Corporation workman, said that at five o'clock on December 13 he closed the two culverts, and at eight next morning opened them

owing to a considerable collection of water within the embankment. Robert Rimmer, also in the employ of the Corporation, said that at eight o'clock on the morning of the 14th there was no water coming from the culverts. Mr. R. P. Hirst, assistant engineer to the Corporation, gave it as his opinion that it was not necessary to carry the culverts down to the low-water line. Mr. William Crabtree, borough surveyor, testified that he thought it was impossible that water flowing from the culverts could have made the depression under the pier. In his opinion the tide forced its way up, and the channel from Birkdale, flowing along with it, had made the depression. A number of fishermen were called, and stated that the tide often made gutters and pools on various parts of the shore in an unaccountable fashion. Sir Douglas Fox, vice president of the Institute of Civil Engineers, said that it was a physical impossibility that the water from such small culverts could have created the channel in question. The low-water stone wall should have been carried further shorewards. Mr. L. F. Vernon Harcourt, C.E., gave similar evidence, as also did Sir Benjamin Baker, who added that erosion from culverts could always be guarded against by providing an apron of stones for a few feet in front, beyond which the effect died out very rapidly. He attributed the accident to a combination of wind, wave and current.

His lordship pointed out that the destructive channel was created on the night of the accident, and that as regards previous damage to the pier by the sea, it was under the extraordinary circumstance of a hurricane, which did not apply in this case.

The jury found that the damage was caused by water from the defendants' culverts, that the defendants had not taken proper precautions in the construction of the culverts to prevent damage to the pier, that the defendants had been negligent in leaving the culverts open, and that the pier was properly protected. It was stated that the parties had agreed to 278*l.* 1*s.* 3*d.* damages, but there being various legal points to be decided, his lordship reserved judgment.

CONTRACTING IN DUBLIN.

ON Monday, the 6th inst., a quarterly meeting of the Dublin Corporation was held, when it was proposed that the report of the markets committee recommending the acceptance of Messrs. William Martin, Son & Co.'s tender for painting work, &c., at the Cattle Market be approved of.

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An amendment was moved that the report be sent back for further information. Messrs. Martin's firm, it was said, did not employ regular men. They took the cheapest labour they could get, and according to a municipal by-law the Corporation should not give employment to such a house.

The Town Clerk read a letter from Messrs. Martin stating that they were prepared to carry out the contract in accordance with the Corporation specifications, employing regular men and paying the full rate of wages.

A member said they would be in a very awkward position if they sent this report back. If they refused to take that contract now, and gave it to any other person at a shilling more than the sum offered to Messrs. Martin, they would be surcharged.

The Lord Mayor said nothing would be gained by sending back the report, because the committee would not possess any further information than the Council.

The amendment was rejected by 28 votes to 6.

The Lord Mayor said, in order that there might be no misconception on this subject, it would be well for them to see how they stood. They adopted two resolutions, by one of which they accepted the House of Commons rule with reference to the payment of the standard rate of wages in the district, and to see that the contractor observed the proper working hours. Last year they went further by saying that none but regular workmen were to be employed. If that meant that the workmen were to be members of a trade society it meant that all their work must be limited to trades societies. But it might mean the employment of regular workmen, although they did not belong to a society. He did not know how this stood. In the present instance they had a letter from their contractor saying that he would observe the Corporation resolutions. On the other hand, a member of this Council made a statement, on the faith of a communication made to him by the Painters' Society, to the effect that the contractor did not employ regular men or pay regular wages. That was a matter for the Society, and if they could show that the contractor was committing a breach of his contract, it would be for the Corporation to take proper action in the matter, and he had no doubt that the Corporation would take action to enforce their own regulations. The trades societies were devoting their energies to settling the rate of wages and the hours of labour; and here they were in Ireland, while a million a year was spent in England in teaching workmen their work, and practically not one penny was spent for this purpose in

Ireland. Would not the trades societies in Dublin be well employed if they turned their attention a little bit to endeavouring to get expended in this country a proportionate amount in having workmen educated in their business so that they might be able to compete with men elsewhere? Unless something of the kind was done, he was afraid that before ten years they would have to give their contracts to English firms, who, because of the advantage of this subsidy, would beat the Irish houses hollow.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

8402. George Robert Dawney, for "Improved tiles for permanent centreing, to be used in the construction of fireproof floors."

8413. James Burgess Morgan, for "An improved sash-fastener."

8427. Daniel Edward Hipwell, for "A fastener for sliding window-sashes."

8511. Thomas Taylor, for "A new or improved bond or tie for ordinary and cavity walls"

8555. William Howard Daniels, for "An improved sash-fastener."

8700. Jürgen Peter Bruhn, for "Improvements in chimney-tops."

8707. Harry Darwin, for "Improved fittings for doors and the like."

8812. Phillip Bright, for "Improvements in water-closets."

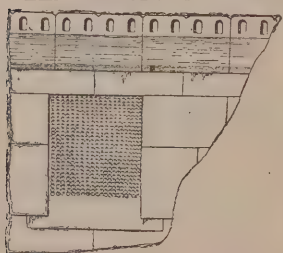
8861. John Frederick Dingle, for "The improved fastener for cords used to ordinary window blind-rollers."

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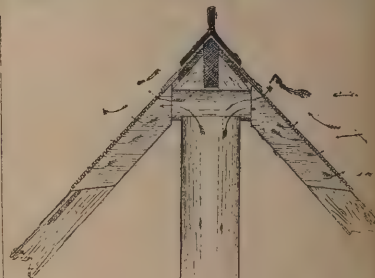


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SPECIAL NOTICE TO THE TRADE AND OTHERS.

[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

TENDERS, ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

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CONTRACTS OPEN.

ABERAMAN.—May 27.—For Building Thirty Houses. Mr. G. A. Treharne, Architect, 5 Canon Street, Aberdare.

ABERDARE.—May 29.—For Building Sixty-six Houses. Mr. T. Roderick, Architect, Ashbrook House, Clifton Street, Aberdare.

ABERDEEN.—May 27.—For Pavilion and Bathing Station. Mr. John Rust, City Architect.

AMERSHAM.—June 15.—For Building Villa. Mr. Guest Luckett, Architect, Granville Street, Aylesbury.

ABERYSTWYTH.—May 31.—For Building Four Dwelling-houses. Mr. J. A. Jones, Architect, Plascrug Lodge, Aberystwyth.

BEDWELLTY.—June 1.—For Building Two Board Schools. Mr. W. L. Griffiths, Architect, 27 High Street, Newport, Mon.

BELFAST.—May 30.—For Additions to Lunatic Asylum. Mr. P. J. Tuohy, Board of Control, Custom House, Dublin.

BELFAST.—June 10.—For Construction of Steel Principal Roof at Terminus. Mr. R. B. Belfrage, District Engineer, Belfast.

BELFAST.—May 25.—For Building Stables at Great Northern Railway Company's Goods Depot. Messrs. Young & Mackenzie, Architects, Donegall Square East, Belfast.

BEVERLEY.—May 30.—For Construction of Laundry. Mr. Alfred Beaumont, Beverley.

BEXLEY.—June 12.—For Supply of Glazed Stoneware Pipes. Mr. E. Reeve Boulter, Bexley Heath.

BISHOP'S STORTFORD.—May 25.—For Construction of a Covered Service Reservoir and Cooling Pond, with Valves and Fittings, Boundary Wall and Gates, Additional Well, together with the requisite Rising Main and Fittings for Pumps, Alterations and Repairs to one of the Engines and its Gearing, and Alterations and Additions to the Engine-house. Mr. Wm. Gee, Council Offices, North Street, Bishop's Stortford.

BOSHAM.—May 27.—For Building Board School, &c. Mr. N. C. H. Nisbett, 62 High Street, Winchester.

BOSHAM.—June 7.—For Erection of Board School Offices, Master's House, for School Board, according to Plans by Mr. N. C. H. Nisbett, Winchester. Mr. J. W. Loader Cooper, Clerk to Board, Emsworth.

BRADFORD.—May 24.—For Building Four Houses, Low Moor. Mr. Herbert Hodgson, Architect, 27 Kirkgate, Bradford.

BRIDGEND.—May 27.—For Erection of Two Dwellings and Alterations at the Nash Lighthouses. Mr. C. A. Kent, Trinity House, London.

BRIDGEND.—May 30.—For Construction of Reservoir (1,000,000 Gallons) and Additions to Farm Buildings, Parc Gwylt Asylum. Messrs. Giles, Gough & Trollope, Architects, 28 Craven Street, Charing Cross, W.C.

BRIGHTON.—May 27.—For Preparation, Supply and Delivery of Cast-iron Lamp Pillars and Copper Canopies for Electric Light Arc Lamps, and Iron and Drawn Steel Bracket Posts for suspending the same. Mr. F. J. Tillotson, Town Hall, Brighton.

BROCKLEY.—May 28.—For Supply and Erection of Continuous Wrought-iron Hurdle Fencing and Gates. Mr. H. De la Hooke, L.C.C. Offices, Spring Gardens, S.W.

BROMLEY.—May 28.—For Distempering, Cleansing, Painting, &c., at Sick Asylum. Mr. G. E. Holman, Surveyor, Bromley.

BUCKLAND.—June 1.—For Pulling and Stacking the Materials of Mansion-house recently Destroyed by Fire. Mr. Stephen W. Williams, F.R.I.B.A., Rhayader, Radnorshire.

BUCKS.—June 5.—For Brick and Iron Bridges at Crendon and Ditton Park. Mr. R. J. Thomas, County Surveyor, Aylesbury.

CHEDISTON.—May 25.—For Restoration of Church. Messrs. Bottle & Olley, Architects, 5 Queen Street, Great Yarmouth.

CHISWICK.—May 31.—For Erection of a Postmen's Sorting Office. Messrs. Widnell & Trollope, 13 Parliament Street, S.W.

CITY ROAD.—May 29.—For Pointing, Painting and General External Repairs at the Old Holborn Workhouse. Mr. C. E. Vaughan, F.R.I.B.A., 25 Lowther Arcade, W.C.

DARLINGTON.—May 25.—For Building Parish Schools. Mr. G. Gordon Hoskins, Architect, Northgate, Darlington.

DORKING.—May 30.—For Making-up Two Roads. Mr. G. Somers Matthews, A.M.I.C.E., 35 High Street, Dorking.

DUNDEE.—June 1.—For Building Post Office. Mr. P. Lawrence, 50A Frederick Street, Edinburgh.

EAST RETFORD.—May 31.—For Building Public Baths. Mr. D. J. Kennedy, Borough Surveyor, Retford.

ENFIELD.—May 30.—For Erection of a Block of Schools. Mr. G. E. T. Lawrence, 181 Queen Victoria Street, E.C.

EPSOM.—May 31.—For Excavating a Trench and Laying a 10-inch Permanent Suction-pipe at Waterworks. Mr. Fred W. Hodson, Engineer, Waterworks, Epsom.

FULHAM.—May 30.—For Painting, Distemping and Other Works at Infirmary. Mr. T. Aplin Marsh, Union Offices, Fulham Palace Road, W.

GREENWICH.—May 29.—For Paving Footways and Making-up Roadways in various Streets. Mr. J. Spencer, 141 Greenwich Road, S.E.

HALIFAX.—May 31.—For Building Bank. Messrs. Horsfall & Williams, Architects, 15 George Street, Halifax.

HOLBORN VIADUCT.—May 28.—For Painting the Ironwork of the Bridges on the Viaduct. Mr. H. Montagu Bates, Guildhall.

KILBURN.—June 1.—For Building Ten Cottages. Mr. John West, Chapel Street, Kilburn, Derbyshire.

KIRKBRIDE.—May 25.—For Restoration of Chancel. Mr. G. D. Oliver, Architect, Carlisle.

LISCARD.—May 27.—For Excavating and Forming a Lake in Central Park. Mr. A. Salmon, Public Offices, Egremont, Cheshire.

LEOMINSTER.—June 5.—For Building School and Alterations to Chapel. Mr. E. G. Davies, Architect, 6 St. John Street, Hereford.

LLANDUDNO.—June 17.—For Construction of a Cast-iron 27-inch Diameter Sewer Sea Outfall, Cast-iron Penstocks and other Works and Alterations. Mr. E. Paley Stephenson, A.M.I.C.E., Llandudno.

MANCHESTER.—May 25.—For the Supply of 1,450 Yards 8-inch Cast-Iron Pipe. Mr. T. de Courcy Meade, Town Hall, Manchester.

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MANSFIELD.—June 10.—For Erection of Boundary Walls, Forming and Levelling Ground, Draining Paths, &c., at Cemetery. Mr. R. Frank Vallance, F.S.I., Mansfield.

NEWMARKET.—May 28.—For Enlargement of Post Office. Mr. W. H. Strudwick, Surveyor, 14 Parliament Street, S.W.

NORLAND.—May 29.—For Building Branch Store and Houses. Mr. Medley Hall, Architect, 29 Northgate, Halifax.

PENDERYN.—May 25.—For Restoring Church. Mr. E. M. B. Vaughan, Architect, Cardiff.

READING.—May 27.—For Repairs and Improvements at General Market. Mr. John Bowen, Borough Engineer, Town Hall, Reading.

RIVER THAMES.—June 5.—For Erection and Completion of Three Brick and Iron Bridges. Mr. R. J. Thomas, Exchange Buildings, Aylesbury.

ROMFORD.—June 4.—For Supplying and Laying Norwegian Granite Channelling and Kerbing. Mr. George Bailey, South Street, Romford.

RUGBY.—May 30.—For Construction of Foundations for New Engineering Works. Mr. F. T. Willard, St. Andrew's Church, Rugby.

SOUTHEND.—May 29.—For Laying 1,150 Yards of Sewers and Drains in various Streets. Mr. Harold Harlock, Clarence Road, Southend.

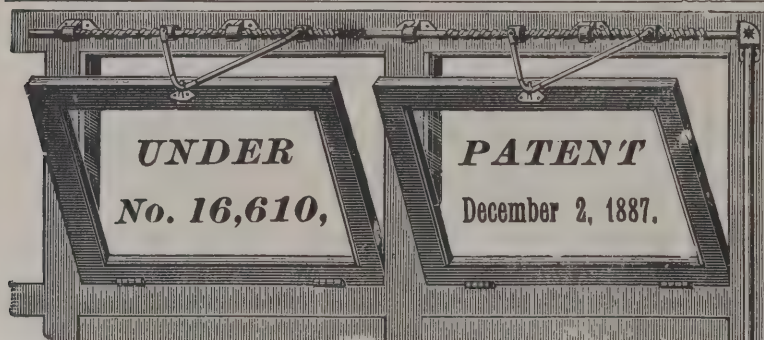
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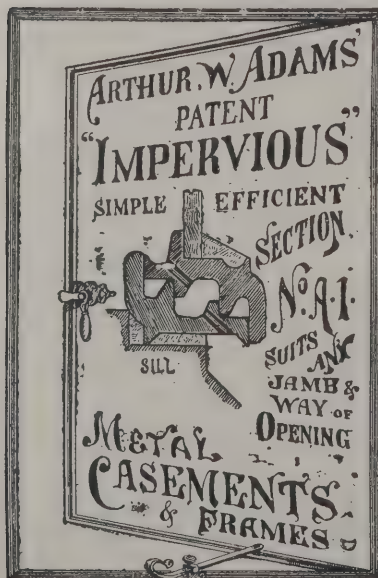
SWANSEA.—June 20.—For Extension of Dock, Construction of Cofferdam, Railways, &c. Mr. A. O. Schenk, Engineer, Harbour Offices, Swansea.

SWINDON.—May 27.—For Erection of a School to accommodate 885 Children. Mr. W. Drew, Architect, Swindon.

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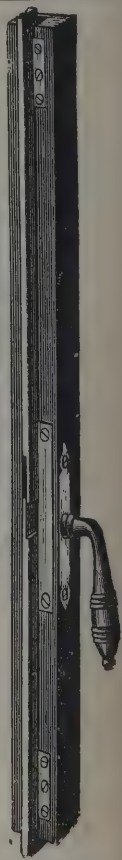
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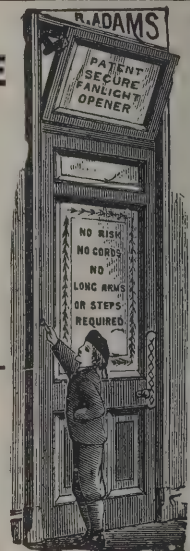
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TOTTENHAM.—May 28.—For Repair of Tar and Asphalte Paving throughout the District. Mr. P. E. Murphy, 712 High Road, Tottenham.

TUNBRIDGE WELLS.—May 25.—For Erecting Dressing Boxes, &c., at the Open-air Baths. Mr. W. C. Cripps, Town Hall, Tunbridge Wells.

WADSLEY.—June 7.—For New Kitchen and Outside Staircases at Asylum. Mr. J. W. Cotterill, Wadsley Asylum, near Sheffield.

WAR DEPARTMENT.—May 31.—For Engineer Station and Out-Station in the North-Western District, Liverpool. Major R. Thompson, R.E., Royal Engineer Office, Rupert Lane Barracks, Liverpool.

WEST HAM.—May 28.—For Supply of Stable Fittings and Supply and Fixing of a Provender Mill Engine for 1½ Cart Horses. Mr. Lewis Angell, Town Hall, Stratford.

WHITECHAPEL.—May.—For Internal Painting and Minor Structural Works at the Infirmary, Mile End Road. Mr. Capel, Union Offices, Baker's Row, E.

WILLOUGHBY.—May 27.—For Building Master's House and Alterations to School. Mr. G. H. Barrowcliffe, Architect, Mill Street, Loughborough.

WOODBRIDGE.—May 24.—For Sinking Two Wells and Construction of Aeration and Filtration Works. Mr. A. Townshend Cobbold, County Hall, Ipswich.

TENDERS.

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For Building Infants' School and Additions at St. Joseph's Roman Catholic Schools, Aberavon.

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Morgan Cox, Port Talbot 895 0 0

J. & S. Rees, Aberavon 874 0 0

JOHN DAVIES, Aberavon (accepted) 795 0 0

For Building Two Shops and Dwelling-houses in Station Street, Port Talbot, for E. J. Davies & Co., Swansea.

J. & S. Rees, Aberavon £1,800 0 0

C. & F. Gain, Port Talbot 1,720 0 0

MORGAN COX, Port Talbot (accepted) 1,550 0 0

Hawkins & Govier, Swansea 1,370 0 0

ABERAVON—continued.

For Building Welsh Church and Extensions to National Schools, Aberavon. Messrs. THOMAS & JAMES, Architects, Port Talbot.

Evan Thomas, Seven Sisters, Neath £1,702 0 0

C. & F. Gain, Port Talbot 1,648 13 0

John Davies, Aberavon 1,610 0 0

Morgan Cox, Port Talbot 1,430 0 0

J. & S. REES, Aberavon (accepted) 1,400 0 0

ABERSYCHAN.

For Iron Girders, Masonry, &c., for Widening Bridge at Abersychan, for the Urban District Council. Mr. E. COOKE, Surveyor.

A. M. Scott, Cardiff £293 0 0

Baker & Co., Newport 285 0 0

Dyne, Steel & Son, Newport, Mon. 260 18 6

T. Bennett & Co., Pontypool 246 0 0

W. Jones, Abersychan 236 10 0

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Surveyor's estimate 236 11 3

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H. Smith, Bournemouth 1,050 0 0

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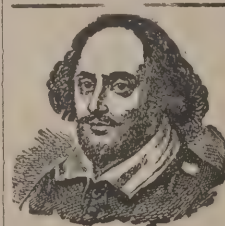
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E. Love	800	0	0
Prosser	525	0	0
H. Rossiter	490	0	0
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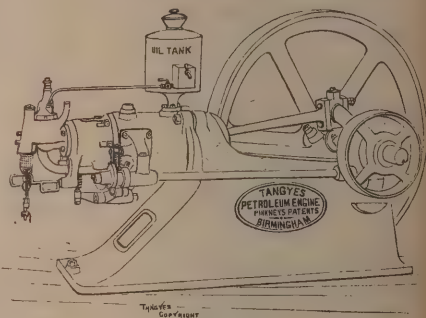
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Mid-Kent Building and Contracting Works, Limited	1,405	0	0
J. Marsland	1,370	0	0

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Akers & Co.	£1,727	0	0
Garratt & Son	1,689	0	0
Lathey Bros.	1,647	0	0
Mid-Kent Building and Contracting Works, Limited	1,603	0	0

For Alterations and Repairs to No. 111 Camberwell Grove, S.E., for Mr. G. W. Marsden. Mr. WALTER J. EBBETTS, F.R.I.B.A., Architect and Surveyor, Savoy House, 115 Strand, W.C.

R. A. Verbury & Sons	£320	0	0
W. Steel	295	0	0
J. R. Tomkins	294	17	0
Canning & Mullins	279	0	0
W. & H. Castle	276	0	0
W. SMITH (accepted)	249	0	0

RICHMOND.

For Building Secondary Schools and Technical Institute, for the Surrey County Council. Messrs. FRYER & BATH, Architects, Queen Anne's Mansions, Westminster, S.W., and Richmond. Quantities by Mr. H. A. E. BULL, Craven Street, W.C.

F. Britton, Highbury	£7,315	0	0
J. T. Messom, Twickenham	7,275	0	0
Speechley & Smith, Richmond	6,988	0	0
G. Godson & Sons, Kilburn	6,931	0	0
Johnson & Co., Wandsworth	6,870	0	0
J. W. Brooking, Richmond	6,868	0	0

* Accepted with modifications.

REDRUTH.

For Building Board School at Meledor, for St. Stephens-in-Branwell School Board. Mr. SAMPSON HILL, Architect, Redruth.

White & Thomas, Camborne	£687	0	0
W. Best, Nanpean	676	0	0
G. Rodliff, Cubert	668	0	0
W. H. Jose, Grampound Road	550	0	0
Gilbert & Richards, St. Stephens	536	0	0
Gilbert & Watters, St. Stephens	535	0	0
GILBERT & CURRA, St. Stephens (accepted)	513	0	0

STOCKPORT.

For Building Three Shops and Houses in Churchgate, Stockport, for the General Purposes Committee. Mr. JOHN ATKINSON, A.M.I.C.E., Borough Surveyor.

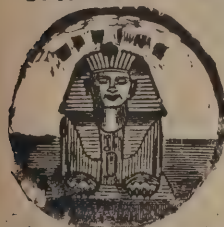
W. H. & H. C. Brown	£1,667	0	0
T. Hoe	1,555	5	5
D. Mullaney	1,520	0	0
J. Briggs	1,398	0	0
W. C. BROADHURST & Co. (accepted)	1,370	0	0
J. & J. Lee	1,316	17	0

WADDESDON.

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Wallis & Sons, Chesham	£2,045	0	0
H. H. Sherwin, Waddesdon	1,860	0	0
G. H. Gibson, High Wycombe	1,795	0	0
C. H. Hunt, High Wycombe	1,793	0	0
J. Holland, Waddesdon	1,701	19	0
Siarey, Aylesbury	1,517	0	0
C. CROOK, Waddesdon (accepted)	1,497	2	0

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PROOFS of this Illustration, which appeared in "The Architect" on June 6, 1885 (now out of print), can be obtained on application to the Publisher, price Sixpence each, post free; on roller, Ninepence.

EMLEY & SONS, L^{DS}.

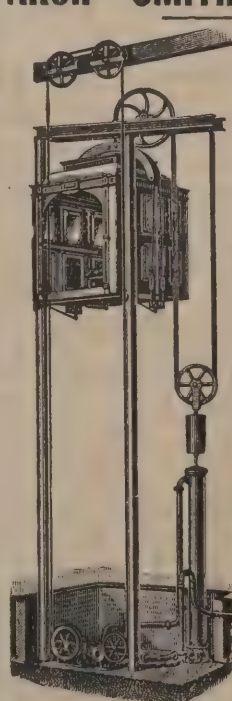
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Wilkinson Bros, London	£10,660	0	0
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G. Henson, Wellingborough	10,127	0	0
G. F. Todd, Derby	10,074	10	0
G. Bell, Tottenham	10,097	0	0
S. Hipwell, Wisbech	10,000	0	0
J. H. Vickers, Nottingham	9,872	0	0
W. Cunliffe, Kingston-on-Thames	9,766	0	0
J. F. Price, Nottingham	9,700	0	0
E. Brown & Son, Wellingborough	9,349	0	0
H. Weldon, Birmingham	9,340	0	0
SIDDONS & FREEMAN, Oundle (accepted)	9,100	0	0

TRADE NOTES.

MESSRS. ARCHIBALD SMITH & STEVENS write us under date, May 22:—In your notes under the heading of "Trade Notes" in your current issue, you mention some lifts which have been erected at Wellington Court, which have one or two features connected with them which are of interest. It would rather imply that the makers of these lifts were the only ones who had these points of interest. We may mention that we are making and have done for some time variable power lifts, and that owing to the extreme sensitiveness of our safety-gear, which has never failed—out of some hundreds erected—an idle rope mentioned by your representative is not required, as our safety apparatus comes into action immediately one of the ropes stretches. In justice to ourselves and the general public we should be much obliged if you would kindly mention this in your next issue."

WE hear that Messrs. E. H. Shorland & Brother, of Manchester, have just supplied some of their patent Manchester grates to the Woodhouse Schools for the Normanton School Board, the patent Manchester stoves previously supplied having proved very satisfactory.

MESSRS. CROWDEN & GARROD, of 62 Southwark Street, are the London agents for the "Eclipse" sanitary sink and drain cover (Howse's patent). It entirely prevents solid matters passing down drain-pipes, &c., and is invaluable for the kitchen sink. Liquids, by passing over the sanitary blocks, are impregnated with a sufficiency of such, so as to act as a perfect deodorant and disinfectant on passing into the drain-pipes, &c. Poisonous gases, foul smells, &c., emanating from drains, &c., rendered entirely innocuous by reason of their contact with the sanitary block, which is suspended immediately over such drain.

WE have to inform our readers that Messrs. Dixon & Corbitt and R. S. Newall & Co., Limited, have transferred their London offices from 30 Great St. Helen's, E.C., to 130 Strand, W.C. This is a return to the offices of the old firm of R. S. Newall & Co., where the company carried on business for the past fifty years.

VARIETIES.

THE death is announced in Albany, N.Y., of Mr. John B. Halcott, who, as an architect, had a large practice over nearly all the eastern part of the country.

AT a special meeting of the Airdrie Town Council Mr. Charles Brown was appointed burgh surveyor.

OWING to insufficient accommodation for the manufacture of gas in Perth it is proposed to move the works to the sand island at the shore. The outlay for removal, new plant, &c., is estimated at about 25,000*l*.

WE understand that the name of Mr. Herbert J. Thurgood, F.S.I., of 27 Chancery Lane, has been added by the Board of Trade to their list from which selection is made when it falls to the Board to appoint a surveyor to act in arbitration cases; and that Mr. Thurgood was last week also appointed surveyor by the Surrey County Council to act under the new Finance Act with reference to death duties.

THE *Leeds Mercury* says that some Manchester capitalists have formed a company, with a capital of 20,000*l*., for purchasing the Gorsey Hill and Stoney Hey estates, comprising the loftiest eminence in the Wallasey district at New Brighton, which commands a magnificent view of the Rock Channel, the approaches to the Mersey and Dee, and the Snowdon and the Carnarvonshire ranges. It is intended to erect a tower on the

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summit of the hill. The grounds will be laid out on the lines of Belle Vue at Manchester and the Douglas Pavilions and Pleasure Grounds, and provision is to be made for a football ground, surrounded by a racing and cycling track. The company has secured the services of Mr. Huon A. Matear, of Birkdale, to develop the undertaking.

A REPORT by Sir William Arrol on the condition of the suspension bridge at Dumfries has been received by Mr. Grierson, the town clerk. He says the bridge is quite strong and safe for any ordinary traffic that can be brought upon it, and the condition of the ironwork, so far as its present state of preservation is concerned, is very fair, and with care and some painting would be satisfactory. So far as he could see, the only defective parts of the bridge are the floor and wind-bracing, which he proposes should be renewed. Owing to its great length compared with its breadth it required to be well braced laterally, and by renewing the floor in the way suggested it would help to stiffen the structure against wind pressure. He also suggests that all iron be cleaned where necessary and painted, special attention being given to the roller-bearings on the tops of columns and band-ties where they enter the ground.

A COTTON warehouse at Bootle, owned by Alderman J. Webster, of Manchester, and stocked with over 4,000 bales of cotton belonging to Messrs. Paton & Maclaren, was destroyed by fire on Wednesday morning, the damage being estimated at between 40,000l. and 50,000l. The goods and building are insured.

THE Spanish Government have invited tenders to be sent in before June 17 for the construction of a quay in Gijon Bay and for deepening the river Aviles. Particulars may be seen at the Commercial Department of the Foreign Office.

THE Lincoln Architectural Association will hold their annual meeting this year at Stamford, on Wednesday and Thursday, June 19 and 20. On the first day an excursion will be made to Duddington, Tixover, Barrowden, Harringworth, Lyddington (where there are the remains of the Bishop's Palace), Seaton, Morcott, North Luffenham, Edith Weston and Empingham. On the second day a visit will be made to Barnack, Bainton, Ufford and Wittering, the six churches and other places of antiquarian interest in the town of Stamford, beginning with St. Mary's Church, and afterwards those who wish to do so will visit Burghley House, near Stamford.

ELECTRICAL.

IN Berlin a curious effect was noticed in the electric train during a thunderstorm at night. All the electric lamps inside and outside the carriages were extinguished every time it lightened, and the passengers remained a few moments in complete darkness. Then the lamps rekindled.

THE *Engineering Record* of New York says that with the opening of this month a United States mail street-car service was begun in Boston. Upon six routes centering at Post Office Square cars are run upon a regular schedule, receiving in some cases incoming mail at the railway stations and receiving from and delivering to substations and carriers in the suburbs. Another route between Dorchester and North Cambridge carries mail between stations and does not come to the central post-office. The cars used are old horse-cars rebuilt and mounted on electric trucks. The two end doors in the old cars were permanently closed and new doors were cut in either side near one end, but without steps or handles to invite accident. Inside the car is equipped with sorting tables and racks like a railway post-office. Nine incandescent lights illuminate the interior and a chemical fire-extinguisher is supplied each car. Speaking-tubes allow of communication with the motor-man and conductor. The end platforms are closed by automatic locking gates and carry a fender and an electric bull's-eye lantern. The cars are painted white and have a slot for mailing letters in transit on each side. Both motor-man and conductor are supplied by the street railway company, the latter to see that schedule time is made as well as to manipulate the trolley rope.

BUILDING AND BUILDERS.

THE *Glasgow Herald* says:—Various builders have already shown their desire to take advantage of the proposed alteration of the building regulations. At the meeting of the Burgh Police Commissioners it was decided by a majority that application should be made to the sheriff for power to alter Article 12 of the building rules annexed to the Burgh Police (Scotland) Act, 1892, so that builders might be enabled to erect tenements with their mean and mutual gables a few inches less in thickness than the statute meantime admits of.

ON Saturday a fire occurred at Plymouth at Mr. S. A. Roach's marble and slate works, an extensive block of buildings

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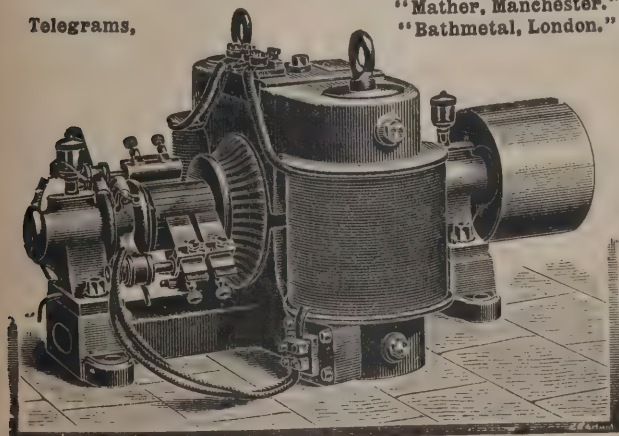
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being destroyed, and damage done to the amount of over 40,000*l*. The stock included about 50,000 builders' laths, and the whole of these, with a large quantity of slate, marble and other material, were destroyed. About forty men are thrown out of employment.

THE *Engineering Record* of New York says Mr. John Rome, one of the best known builders in Brooklyn, N.Y., died May 5. Early in the '60's he rebuilt the walls of the *Eagle* newspaper building without disturbing the occupation and constant use of the structure, and he is said to have been the first builder in the country to attempt this kind of work.

THE *Scientific American* says the Sage House, Brooklyn and St. Mark's Avenues, Brooklyn, N.Y., has been successfully moved by B. C. Miller & Son, the house movers of that city. The building is of stone, weighing about 1,300 tons, and was built by a son of Mr. Russell Sage, of New York. The contract for removal called for its being moved 30 feet toward St. Mark's Avenue and 20½ feet toward Brooklyn Avenue, and that it should be raised 2½ feet on its foundations. This to be done without break or crack in the walls.

At the Paisley Dean of Guild Court plans of additional bath premises in Storrie Street were approved of. The principal additions are a new swimming pond, 75 feet by 40 feet, and several warm baths. The total cost is estimated at 5,302*l*, exclusive of the purchase price of several properties to clear a site.

At the meeting of the Bath Board of Guardians a motion that a committee should be appointed to report on the protection from fire arrangements at the workhouse was negatived.

AN inquiry has been held at Crewe respecting an application of the Corporation to borrow 8,000*l*. to build an isolation hospital.

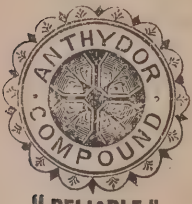
NEW CATALOGUES.

WE have received from Messrs. Morrison, Ingram & Co., of the Hygeia Works, Cornbrook, Manchester, their excellent illustrated catalogue and price list of sanitary appliances, comprising lavatories, baths, water-closets, urinals, sinks and plumbers' brass and ironwork, as manufactured by them. The section devoted to lavatories is particularly interesting, and one-third of a large catalogue containing 180 pages has been devoted to lavatories. The compiler of the catalogue has

devised a most handy mode of indexing, there being for each section a numerical index, and also a pictorial index of typical appliances. As the manufacture has been made the subject of much attention by Messrs. Morrison, Ingram & Co., we think it of interest to give their own account. They say:—"The advent of our patent D lavatory marked a new era in lavatory work, and revolutionised the lavatory trade. The old order of things has happily passed away, and our sanitary lavatory system obtains instead. It is only bare justice to ourselves to indicate the fact, and it proves the initial soundness of our principle, the pioneer of a system. The chief novel features of our well-known and now famous D lavatory—still pre-eminently the best—are the arrangement of taps and inlet, the conformation of bowl, giving great comfort to the user, and the successful introduction of the sanitary soap and brush trays. But further developments have lately been introduced, to which attention may be directed, viz the Club or Hotel Lavozone, Louis XV., and Era lavatories; also our new patterns of school lavatories. The pages are intended to represent the extent and variety of our present lavatory designs, and how far we are capable of executing orders for almost any class of work. But we are ever willing to adapt these patterns where practicable, and work specially to the designs of architects and others. It has been our privilege to be consulted by some of the leading architects in the country, to prepare plans and specifications of important lavatory and other schemes of sanitary fittings, and to carry out the same with the best possible results. It therefore affords us pleasure to know that our suggestions have proved so acceptable to our clients; indeed, this department has become an increasing feature in our business." About forty pages are devoted to baths and their fittings. The baths are of all kinds, and among them a specially good type are the patent steamless and noiseless baths. The section for plumbers' brasswork has received much attention, and an endless variety of fittings is shown. Their regular productions consist of yellow metal, gun-metal, hygeia white metal and bronze metal, all composed of the best materials. We may direct attention to their hygeia white metal, which is dense and tough, and capable of taking and retaining a lustrous silvery polish, while the price is not more than brass nickel-plated. The section 4 is an exhaustive one as regards closets, urinals, sinks, &c. We can recommend the catalogue for reference, as such a variety of choice is afforded. We cannot conclude without calling attention to the many and excellent coloured plates interspersed in the volume.



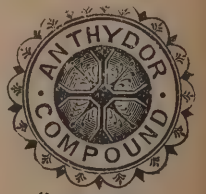
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IMPERIAL MARBLE COMPANY, LIMITED.

On the 16th inst. an exhibition of the productions of this syndicate was held at Winchester House, and some beautiful specimens of marbles were shown. By the Moreau-Rae process, to which we had occasion to refer in our issue of March 16, 1894, limestone is chemically metamorphosed into marble of the finest quality, which is indistinguishable from that which is prepared in nature's laboratory. This result is brought about by the following means:—

The object to be converted into marble is first cut in the soft stone, and is shaped, worked, or carved (as the case may be)—is in fact completed so far as all machine and mason's labour is concerned. It is then immersed in a bath or several baths of metallic solutions, where it receives its colour or colours. In some cases where it is desired to produce particular markings or veinings, the object is first partially coated with a thin varnish. This varnish is laid on the surface of water, where it assumes lines and patches more or less in accordance with the intention of the operator, but being on so unstable an element as water a very pleasing freedom of design is obtained. The object is then brought in contact with the varnish, which instantly adheres thereto. It is then dried. Being thus marked here and there with veins and patches of varnish which is impermeable, it is dipped in the baths, each of which produces its own distinctive colour, the metallic solutions penetrating the pores of the stone wherever the varnish is not. It is transferred from bath to bath where many shades of colour are required, and the various solutions blend and overlap each other. The colouring solutions having entered the stone, which they do in the space of a few minutes, the object is dipped in a bath of warm water, which expels all the air and drives the colouring solution to the very heart of the stone very rapidly, and penetration being complete the result is an object in coloured limestone, which being dried is ready for conversion into marble. At this stage it is possible, if desired, to superadd

other colouring solutions, but it is rarely that this is required, as the effect that will be produced by immersion in any colouring bath for a given space of time is accurately gauged. The colouring now being completed and the object dried, it is immersed in an indurating bath, where the conversion into marble is completed. In this bath the object becomes of the consistency, approximate density and specific gravity of marble; in fact it becomes marble. Where the objects to be treated are large, they are taken out of the hardening baths after certain intervals and immersed in warm or cold water (as the case may be), which drives the hardening solution to the centre of the stone, leaving the surfaces in a condition to absorb more of the hardening solution and to insure uniform and complete penetration. The increase of density in the stone depends greatly on its structure, but in soft stones an object after treatment gains some 30 per cent. of its weight, and that without suffering the slightest change in shape or increase or diminution of bulk. By this simple process actual marble is produced, which after polishing in the ordinary manner is available for all purposes of architectural construction and decoration, for which, owing to its comparative inexpensiveness, it will no doubt be largely employed. It has already been used with admirable effect at the Niagara Hall Skating Rink.

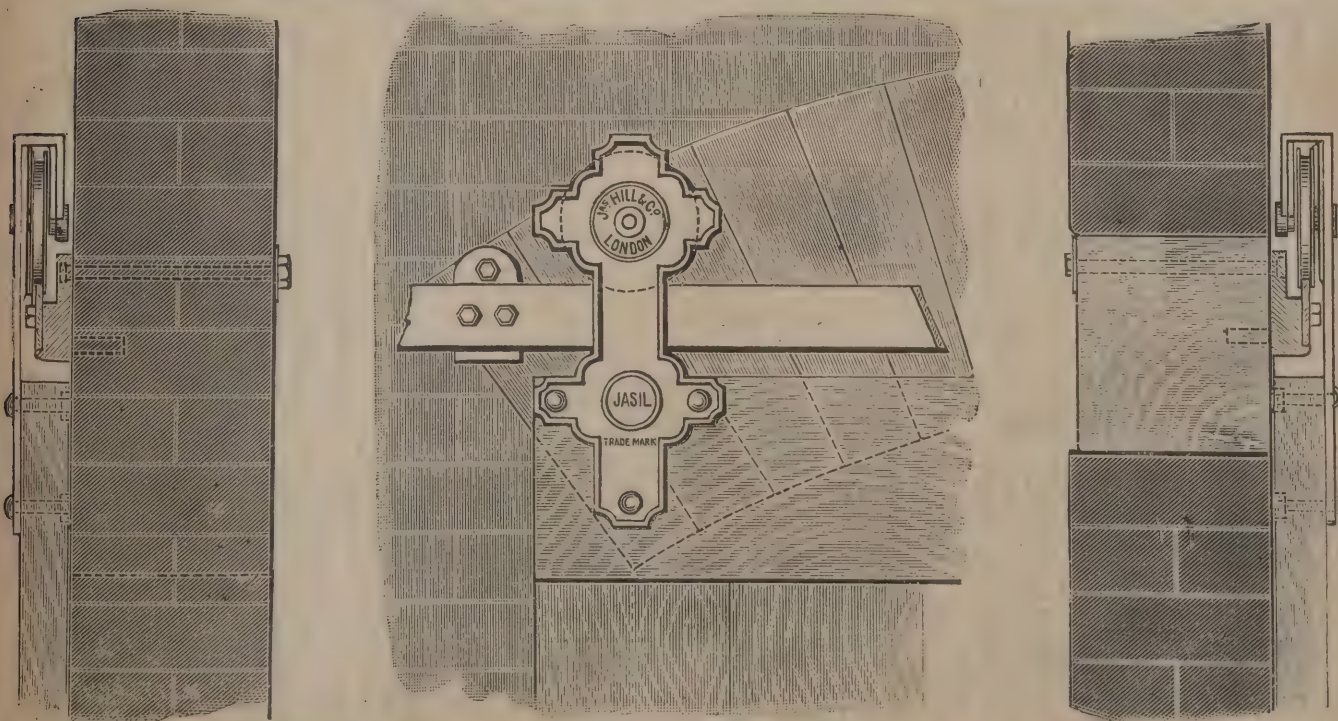
THE HOUSING OF THE WORKING CLASSES IN LIVERPOOL.

A CONSIDERABLE quantity of property certified by the medical officer for health as being unfit for habitation has been destroyed in Liverpool, but very few of the vacant spaces, says the *Liverpool Courier*, caused by the demolition of these houses have been utilised. A sub-committee of the insanitary property and artisans' dwellings committee of the City Council was elected to consider the subject of providing dwellings for the working classes on this vacant land. This sub-committee, of which Councillor Burgess was chairman, has just made its report, which has been submitted to a meeting of the insanitary property committee. In the course of this report the sub-committee expressed the opinion that the results of the practice of selling vacant sites to builders for the erection thereon of cottages for the labouring classes were not entirely satisfactory, from the point of view of providing accommodation for the class of people accustomed to live in court houses, the houses erected being let at rentals too high

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for these persons to pay. In order the better to enable a comparison to be made between the rents of the new cottages and those of houses such as the committee demolished, it should be stated that the usual rent of a court house was from 2s 6d. to 3s. per week, and of those fronting streets and with their backs to the courts, from 3s. 6d. to 4s. per week. The sub-committee therefore recommended that the Corporation should retain some sites in their own hands when they became vacant under the twelfth presentment, and erect thereon suitable tenement dwellings or cottages to produce such low rentals as would give a fair return to the Corporation upon the cost of the buildings and the value of the land, and provide a sinking fund for the repayment of the moneys borrowed, the value of the land being taken at the price it would fetch if sold to builders of cottage property. The sub-committee were of opinion that it was desirable that the persons displaced should be rehoused as soon as possible in sanitary dwellings erected upon the sites of the houses demolished or adjacent thereto, but at the same time they thought it advisable to point out that, owing to the crowded state of the land upon which the insanitary houses stood, it was quite impossible to provide upon any given site accommodation for the same number of persons displaced therefrom, having regard to the due requirements for light and air. With regard to any large area which might be acquired under the Housing of the Working Classes Act, 1890, it might perhaps be possible to provide accommodation for the whole of the population displaced, in large high blocks of dwellings similar to those in Victoria Square and Juvenal Street, but the sub-committee were of opinion that this class of dwelling should not exceed three storeys in height, in which case the whole population displaced could not be provided for. The sub-committee therefore recommended that in any future application to the Local Government Board for a loan, either for the purpose of demolishing or erecting houses, the Board should be informed that the Corporation had an objection to the erection of buildings of more than three storeys in height, and that in their opinion it was impossible to rehouse the population in ordinary cottages or tenement dwelling-houses of not exceeding three storeys in height, and that even if it were possible it would not be advisable to do so, having regard to the density of the population in Liverpool, which exceeded that of any other large town in the United Kingdom. The following were the conclusions which had been arrived at by the sub-committee:—(1) That

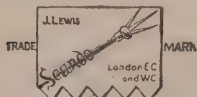
the Corporation should, on the first plot of land coming into their possession convenient for the purpose, erect dwellings suitable for the accommodation of the class of persons at present living in court houses. 2. That these dwellings should, as a general rule, be either self-contained houses of two storeys in height, or houses built upon the "flat" system, and containing one, two, or three rooms in each tenement, with, in some cases, the addition of a scullery. 3. That if a sufficient number of dwellings were built to make it worth while to do so, a man should be appointed to supervise and undertake the letting of a certain number within a given area, and collect the rents from the tenants. 4. That as far as possible in letting new dwellings provided by the Corporation preference should be given to persons who had hitherto occupied the demolished or other court houses.

The suggestions of the sub-committee will receive careful consideration.

HARTWOOD LUNATIC ASYLUM.

THE lunatic asylum which has been erected at Hartwood for the Lanark District Lunacy Board has been opened by Sir Windham C. Anstruther, the chairman. The asylum has been built upon the estate of Hartwood, which was purchased by the Lanark District Lunacy Board in 1889, and stands near the western boundary of the estate, to the northward of the Caledonian Railway Company's main line between Edinburgh and Glasgow. The land extends to over 600 acres, and is undulating in character, ranging from 490 feet to 828 feet above the level of the sea. The buildings, which were designed by Mr. J. L. Murray, Heavyside, Biggar, are Scottish Gothic in style. They are built in the pavilion form, and the chief feature consists of two battlemented towers in the central block. The general ground-floor stands at an elevation of 655 feet, the whole of the front commanding a fine view of the surrounding district. The total area is about 10 acres, the extreme length along the front from east to west being 850 feet, and from north to south 470 feet. The central block of the buildings consists of the administrative department. On the ground-floor there are the dining-hall, to accommodate 600 patients, besides attendants, between which and the kitchen there are a commodious serving corridor, the kitchen, 60 feet by 40 feet, with sculleries, dish-rooms, stores and attendants' dining-room, and immediately behind this the

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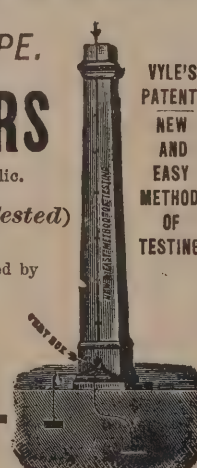
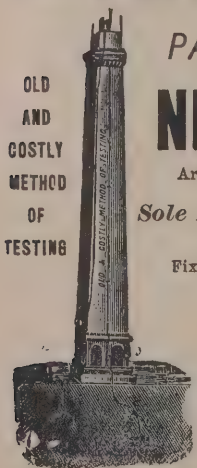
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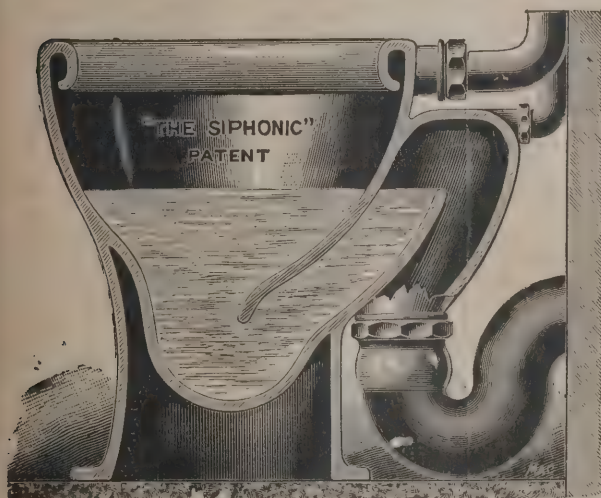
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general store. Above the dining-hall on the first floor is the recreation-hall, capable of seating comfortably 1,200 persons. On either side of the administrative block are the male and female sections of the asylum, the male side being to the east. The male official block, consisting of three storeys, adjoins the administrative, and contains the accommodation for the male staff of the asylum. The next block on the front, two storeys in height, consists of the male senile wards, and adjoining this to the east are the male hospital wards. The corresponding buildings to the west of the administrative section accommodate the female staff and the senile and hospital female patients. Running north from behind the front buildings on either side are the male and female acute blocks, consisting of two storeys, and are upon the same floor level as the front. Still further to the north on either side are the male and female chronic blocks, consisting of three storeys, the ground floor of these being at a 10-feet higher level. These blocks stand at an angle to the other buildings, so as to give the fronts a southern exposure, and immediately opposite these blocks on the other side of the connecting corridors are the chronic bath rooms and attendants' recreation-rooms. The whole of these blocks are connected with each other by glazed corridors, 8 feet in width, the total length of corridors thus employed being 1,072 feet. The blocks are thus isolated, minimising the risk of fire, besides securing a better lighting of the whole buildings. On the male side, immediately behind the administrative block, are the workshops, consisting of bakery, joiners', shoemakers', tailors', upholsterers', painters' and plumbers' shops, and adjoining are large coal stores, fire station and mortuary. On the female side also behind the administrative is situated the laundry block, consisting of the boiler-house, engine-room, wash-house, laundry, receiving, sorting and delivery-rooms. Detached to the east of the asylum, at some little distance, is the medical superintendent's house, and to the south of the main line of railway are several blocks of attendants' cottages, and the main entrance gateway and lodge. Besides the erection of these buildings a large amount of work had to be executed in forming the branch railway from the main line to the asylum, preparing the site for the buildings, forming reservoirs for water-supply, and in laying out the grounds, necessitating the removal of about 290,000 cubic yards of earth. The whole of the building materials had to be brought by rail, as no proper stone for the buildings could be got upon the land; and for this purpose there have been used about 75,000 tons. The whole asylum buildings are warmed throughout with mild hot water,

this being heated in sections by means of steam supplied from one central boiler, and the baths, lavatories, kitchens and sculleries are also supplied with hot water in the same manner, the heat being capable of being turned off or reduced on any block at will. The return steam or condensed water is taken back to the boilers, thus saving all loss of water, and also saving fuel through the hot water being returned to the boilers. The steam-pipes, steam-heaters and connecting-pipes are placed in roomy subways underneath the buildings, by which means all unnecessary traffic in the wards of the asylum for repairs is prevented. In carrying out the system of steam and water pipes connected with the asylum there is a total length of 16,689 yards, or nearly 9½ miles of pipes. The buildings, including the doctor's house, are lighted with electricity, generated from the engine-room. There is a gross boiler-power of 750 horse, with an engine-power of 200 horse indicated given off by three horizontal compound engines. There are altogether 1,260 lamps, varying from 8 to 100 candle-power each, giving a total candle-power of 21,964, requiring 137 horse-power to light the whole. Besides the generating plant there are ample storage batteries, capable of sustaining the light during the night. In the event of any breakdown in the generating plant, one of the engines and dynamos will be at rest and ready for use if such were to happen. The whole of the blocks, together with the doctor's house, railway station and farm steading, have been, or are being, connected by telephone to each other for convenience of administration. For the proper supply of water to the institution the advice of Mr. James Gale, C.E., given to the Glasgow District Board of Lunacy in 1883, has been followed. A dietetic reservoir has been formed to the north of the asylum at a top-water level of 711 feet O.S.D. It is supplied by springs and has a catchment area of 144 acres, the greater part of which has been newly cross-tile drained 2 feet deep and led into the reservoir. The area is composed of hill pasture and is free from any peaty soil. The available rainfall, taken at 15 inches per annum, gives a supply during the year upon this ground equal to 223 gallons per head per day for 600 inmates. The reservoir as formed covers an area of nearly 4 acres, and is 9 feet deep. It has an available storage capacity of 8,280,000 gallons, which alone would give a supply for 180 days for 600 inmates at the rate of 76½ gallons per head per day. The water from this reservoir to the asylum is passed through ample filter-beds, having a total superficial area of 2,340 feet. For the supply of water for flushing and fire-extinguishing pur-



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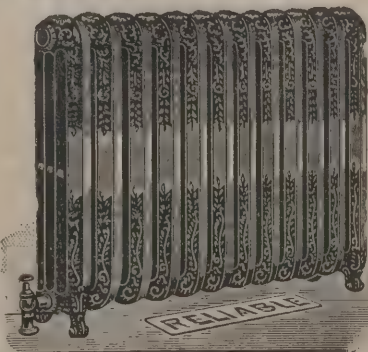
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poses a reservoir has been constructed at an elevation of 779 feet O.S.D. This reservoir is supplied from a catchment area of about 60 acres, chiefly peat moss, and with 15 inches available rainfall has a supply equal to 93 gallons per head per day for 600 inmates. This reservoir covers an area of about 2½ acres, and varies in depth from 4 feet to 11 feet. It has a storage capacity of 5,044,000 gallons, which gives a supply for 180 days for 600 inmates at the rate of 46 gallons per head per day. The drainage of the asylum has been carefully arranged upon approved principles, and carried out in substantial manner, the sewage being conducted to filtrating depositing tanks to the south of the main line, the liquid sewage being utilised in irrigation below this point. The buildings are ventilated in every part by natural ventilation. With regard to the interior finishings, one special feature in regard to the asylum is that the whole plasterwork has been finished in Keene's cement upon a ground-work of Portland cement, thereby obtaining a beautifully-polished surface, and greatly lessens the risk of the lodgment of germs and reduces the risk of breakage. The whole of the wood floors have been laid in pitch pine, and the lower walls, where not lined with tiles, are lined with pitch-pine also in 3-inch widths. A number of specially-designed fittings have been adopted throughout the asylum, such as locks, sash-openers, bath-fittings and screens, store-bins, &c., and also in the arrangement of the kitchen cooking apparatus. For the protection of the patients the whole main line along the front of the asylum and up the western boundary to the lower reservoir and round both reservoirs has been fenced by a 7-feet high unclimbable iron fence, and besides this there have been erected about 9,000 yards of galvanised iron and wire-fencing. The excavations in forming the railway and preparing the site were commenced on June 23, 1889, and the first stone of the buildings was laid on May 17, 1890. The whole buildings have thus been completed three days within five years.

VENTILATION OF HOSPITALS.

AN article on "The Ventilation of Hospitals and the Treatment of Infected Air" appears in our contemporary, the *Lancet*, in which are discussed in considerable detail the arrangements for ventilation which are being carried out at the new General Hospital, Birmingham, arrangements which have recently been the subject of vehement anonymous attack. The *Lancet* says:—"In no other buildings is it more essential or

vital that ventilation should be efficient and conducive to comfort and to health than in those set apart for the tending and nursing of the sick. Most of our large hospitals were founded at a time when methods of ventilation and sanitation were crude; but even in hospitals of comparatively modern construction, in which the sanitary arrangements may be perfect so far as regards the removal of effete liquid and solid products, there will generally be found much that can be done to improve the satisfactory displacement of vitiated air and the means of providing a fresh and pure supply. The importance of such a provision is doubly emphasised when we consider, as experience has shown, how beneficially the free and open atmosphere ministers to the healing of wounds and to the elimination of morbid conditions. No apology is needed, therefore, if we lay before our readers the details of so important a departure in regard to the construction of one of our large provincial hospitals as the installation of a new method of ventilation, which, we venture to think, is far in advance of any scheme which has hitherto come under our observation, and more particularly because not only does it provide for the efficient and salutary ventilation of hospitals, but also for the treatment, if need be by means of antiseptics, or purification of the vitiated air of the wards before it passes into the outer atmosphere. For the present, however, we will confine ourselves to the method from the point of view of ventilation only, and in a succeeding section we will describe how this system may, by the simplest, and, we think, most effective, manner be employed for the treatment of vitiated air with the important view of preventing the spread of infection from such buildings as smallpox and scarlet-fever hospitals. For this purpose we cannot do better than take as an illustration the new General Hospital, now in course of erection in Birmingham, which, by the courtesy of the architect, Mr. William Henman, we have recently had an opportunity of inspecting. Let it be understood that in doing so we are not dealing with a system that has merely been projected, but with one that has already been carried into practice in several infirmaries and other buildings, schools, police courts, and the like, and which, as we have just said, has actually been provided for in the plans of one of our great hospitals. The building operations, indeed, at the new General Hospital, Birmingham, are so far advanced as to afford a clear idea and plan of the installation which is to effect the ventilation of the hospital." The article then briefly reviews the systems of ventilation which are available, and points out broadly the advantages of the



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propulsion system. The method of its application and the installation at the new General Hospital, Birmingham, are then described. The method of ventilation adopted is primarily due to Mr. William Key, an engineer of Glasgow. "In applying the Key scheme to a hospital a selection is first made of a position, uncontaminated by surroundings (or of more than one such position if the buildings are extensive), where air can be drawn in towards an extended screen, kept moistened with water and periodically flushed to free it from the large amount of dirt which it intercepts. The screen is formed of a series of cocoanut-fibre cords stretched vertically and interlaced with copper wire to keep them in position. On the outer side a coil of steam or hot-water pipes is placed to prevent freezing in the winter, and on the inside are other heating coils arranged so that by means of doors or louvres the air passing through or under them may be regulated. It is then forced onward by means of a rotary fan or air-propeller, set in motion by steam, water, gas, or other power—preferably an electric motor—and finds its way to the several rooms, wards or corridors by means of a wide and lofty horizontal duct and up flues, all calculated to the required areas, at the base of which are more heating coils, together with a simple contrivance by which both the volume and temperature of the air-supply to any separate part of the buildings can be adjusted to a nicety. The air enters where required by means of trumpet-mouthed openings, at about two-thirds the height of the storey, so as to disperse evenly throughout the apartment; and at the same time it expels an equal amount of air, principally through openings provided on the same side of the room as the inlets, up flues of the proper sectional area, into ducts in the roof, and thence to the open, through valved and louvred turrets or flaps, four-sided, so that outer movement of the atmosphere shall exert no adverse influence upon the outflow. These outlet air-valves are so constructed as to place the air within the building under a slight pressure of about four ounces per square foot in excess of the outside atmospheric pressure at the time. In the new General Hospital at Birmingham an installation has been provided for heating and ventilating the buildings, the cubical capacity of which equals about 2,000,000 feet; so that, as the air may be changed ten times per hour without opening any windows, 20,000,000 feet of air every hour has to be propelled, cleansed and warmed; for which purpose there will be eight 'fans,' from 6 to 8 feet diameter, to be turned by electric motors, 2,000 superficial feet of cleansing screen and about 35,000 feet of steam tubing."

After referring to some of the remarkable effects produced upon the air by the purifying screens above referred to, the article proceeds:—"It was the important purifying property of the screen just alluded to which led Mr. William Henman to suggest that the outgoing air, after being vitiated or infected by patients, might again be purified, so far as regards infection, by the use of similar screens at the outlets. This project is so important in connection with the construction and site of infectious diseases hospitals as to merit very serious consideration and attention at the hands of the profession and others who are interested in the subject. Mr. Henman considers that in fever hospitals each block of buildings should be separately supplied with an air intake, screen, heating-coils and fan, which in a building of only one storey may be arranged in the roof space. Mr. Henman takes no credit for the method by which a suitable supply of air is cleansed, tempered, humidified and propelled into the buildings, but acknowledges his indebtedness to Mr. Key for the assistance he has rendered in working out his ideas in connection with the methods he adopts. It is simply proposed that air so cleansed, tempered and humidified should be propelled through narrow, wedge-shaped openings in the ceilings, and by means of a simple form of spreader evenly distributed throughout the wards and corridors. The feature which Mr. Henman claims to be a novelty is the placing of a screen (somewhat similar to those employed by Mr. Key at the air-intake) at the head of every bed, and keeping the same charged with a disinfecting fluid. An outlet flue will be provided at the back of each screen, so that as fresh air is constantly being propelled into the ward an equal quantity will be forced through the screens, all other outlets being stopped; consequently almost immediately the air becomes contaminated it will again be purified, even before it actually leaves the apartment, and thus purified will pass up the flues and into the open air. A very simple contrivance is employed for keeping the screens constantly charged with disinfecting fluid, so as to obviate disturbance to the patients in the wards, and reduce personal attention to the least possible limits. The disinfecting fluid found to be perfectly effective in destroying disease germs is a weak solution of carbolic acid. Above and below each screen a shallow trough is placed, the upper and lower ones respectively being united by lead piping, carried to any convenient position outside the wards, each connected to a cistern of moderate dimensions to which a small pump is attached, so that as the fluid flows along the upper pipe and trickles down the screens the surplus is caught in the

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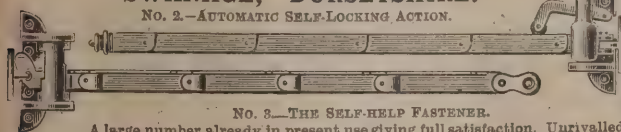
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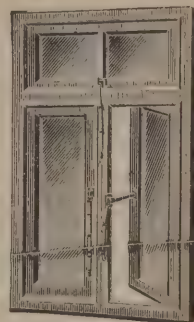


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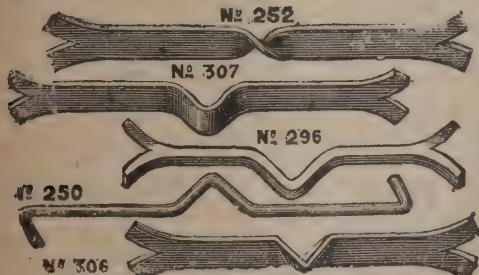
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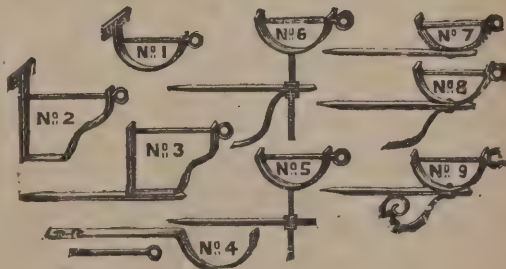
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lower troughs and returned through the other pipe to the lower cistern, whence it is pumped to the upper one. This may be made practically automatic by applying to the pump the same motive power used for turning the fan which propels fresh air into the building, and by having a third cistern or reservoir with regulated supply to make up for loss of fluid by evaporation from the screens. There can be little doubt of the efficacy of the screens in removing micro-organisms, in view of the indications afforded by a series of very searching and exhaustive experiments carried out under the direction of Dr. Sims Woodhead and Dr. Cartwright. The results of this investigation may be summed up as follows:—(1) Micro-organisms are entrapped by passing air through moistened screens. (2) The apparatus employed in the experiments in which dust loaded with organisms was forced through an experimental screen into a wooden chamber, from which samples of the air were taken from time to time for bacteriological analysis, gave in all probability less perfect results than would occur in practice, because in these experiments the air, highly charged with micro-organisms, was both forced directly through the screens and also by force drawn through them, whereas in buildings the air would be propelled gently through the screens simply by the slight pressure of the incoming air, no suctional force whatever being employed. (3) The very marked diminution in the number of micro-organisms which passed through the screens when supported by means of perforated zinc, and the smaller number still which pass through a thin layer of cotton wool, indicate varying powers of filtration, and point to the possibility of devising a screen which will practically free the air from germs and yet not unduly retard the expulsion of the air from the building. (4) In proportion to the closeness of texture of the screen material, the size of the screens must be increased so that the air may pass through them with the least possible force being required to expel it. (5) The moistened screens are all that is required to arrest the germs, but carbolic acid should be added for destroying them. (6) Disease germs or fungi likely to be conveyed by the atmosphere are usually found attached to comparatively large floating particles, as the scales of the epidermis, or fluffy shreds of material which would be entrapped by the screens in greater proportion than the germs experimented with. In accordance with the suggestion contained in paragraph 3, that better results might be expected by the use of finer screens, yet of ample size to permit of the passage of air, a building has been erected in which these suggestions can be adopted, and tests will shortly be made exactly on the same

lines as when the screens are employed for the purification of air emitted from hospitals. It is probable, again, that the passage of large volumes of warm air through the screens would volatilise a considerable quantity of the disinfecting fluid with which the screens will be constantly charged, and that any germs which might not be entrapped by the screens would thereby be quickly deprived of vitality, and, moreover, that the mere reduction of the number of germs would be a considerable safeguard, because the attenuation of germs, as is well known, lessens the severity of their effects.

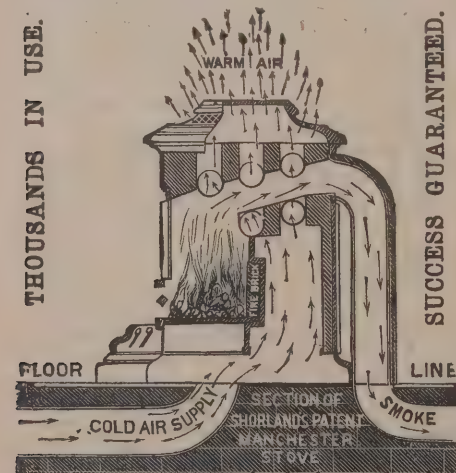
As regards the cost of the method proposed, the necessary apparatus is stated to be quite inexpensive and easily applied, and Mr. Henman is prepared to show that buildings can be erected and equipped at considerably less cost than is now expended upon hospitals relying only upon the ordinary means for ventilation, without any appliance for purifying the air emitted. More space for the patients has been the demand for some time, which, beyond a given area known to be necessary for nursing purposes, in reality means more air. It is very naturally asked, where, with such a constant change of air, is the necessity for more space within the hospital than is required for tending the patients? It is contended that with suitable appliances by which the air can be constantly and quickly changed, as in Mr. Key's method of ventilation, buildings might be less in cubical capacity by at least one-third; and not only would this reduction in size more than compensate for the cost of apparatus and its working, but the daily labour and charges for heating, lighting, cleaning, administration and maintenance would be proportionately less. Another point of importance is that those who tend the patients would be constantly in a pure atmosphere, for no sooner is the air vitiated by contact with the patients than it is at once purified and expelled.

The Key method of ventilation has met with very distinct success where it has already been installed, as, for instance, at the Victoria Infirmary, just mentioned, in several schools, and in other public buildings,* and the results of its adaptation to a large general hospital such as that in course of erection in Birmingham will be watched with very great interest, the

* Mr. Key's method has been applied already to four hospitals or infirmaries, to some twenty-four large schools, and to several other large buildings, as cloth factories, police courts, public libraries, and so on, while further installations are being provided for in fifteen similar buildings at the present time.

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completion of this admirably-designed building being expected in about two years' time. The practicability of the method, however, is obvious. The important proposal of the architect, Mr. Henman, to disinfect the outgoing air of infected wards where the Key method of ventilation is in force has, of course, not yet been put to practical test; but there is good ground for believing, as we have already shown, that this important adjunct to Mr. Key's method of applying the propulsion system of ventilation may offer a really satisfactory solution of that difficult question of how to make infectious-diseases hospitals safe to the surrounding neighbourhood. At any rate, the method, with its proposed augmentation, is of sufficient importance and scientific merit to demand the careful and serious consideration of all those interested in the vital questions of the ventilation and the purification of the air emitted from infected buildings. We congratulate the authorities at Birmingham on the trouble and care they are taking to provide and equip a hospital fully in accordance with the requirements of modern scientific research, and we trust that other communities which may be brought face to face with a similar problem will evince an equal share of anxiety to attain so admirable and worthy an end.

TRAMWAY WORKING.

THE Leeds Corporation are desirous of working the tramways taken over from a company on a system that will differ from what is employed. Accordingly inquiry was made in several towns respecting various systems. The following abstract of the report has appeared in the *Leeds Mercury* :—

The System at Darlaston and Walsall.

With reference to the electrical overhead tramways at Darlaston and Walsall, which were inspected in September and October, 1893, the report explains that the system there in operation differs from that of the Thomson-Houston Company on Roundhay Road. At Darlaston the posts and wires are on one side of the road only, with one wire for single track and two for passing places and double lines. The promoters claimed this feature to be superior to the corresponding part of the Thomson-Houston system, and the claim seemed to be a just one, as no wires crossed the streets and many less guy wires were required to pass round corners. Another noticeable feature was the double-decked car in use. The next tramways

to which the report refers are those at Newcastle-on-Tyne, consisting of fourteen miles of single track. These are worked by horse traction, and are let to a company on a lease, five years of which have yet to run. The Corporation, to whom the lines belong, have had an offer from a company to secure the remainder of the lease on condition that a cable system be adopted, and are now applying to the Board of Trade for a provisional order to enable them to apply the cable system to a considerable portion of the lines. Whilst this is the fact, says the report, it would appear from the public press that the Council have not come to a final conclusion with regard to the cable system, as at their meeting on December 5 last the statutory resolution of the Council to proceed with the application for a provisional order was only carried by a majority of one, two members not voting. The provisional order was further discussed by the Council on January 17, and on a motion that the provisional order for the tramways of Newcastle be not proceeded with in the ensuing session of Parliament, the voting was twenty-five for and twenty-seven against, and three did not vote. The provisional order is therefore being proceeded with.

The Cable in Edinburgh.

From Newcastle the committee went to Edinburgh, where the Corporation took over the tramways about a year and a half ago. In 1887 the Edinburgh Northern Tramways Company, who are tramway builders, made an offer to the Corporation to lay the cable along what are known as the Trinity and the Stockbridge routes. This was accepted. The Trinity route is a double line $1\frac{1}{2}$ miles long, with gradients which vary from 1 in 11 to 1 in 60, the total height ascended being 187 feet. Along this track are eighteen curves, one less than a right angle. The Stockbridge route is $1\frac{1}{2}$ miles of double line, on which the steepest gradient is 1 in 13, and the total rise 173 feet. It is almost entirely a series of curves over steep and very narrow roads. The diameter of the cable is 1.03 inches, and the weight five tons per mile. The lines are equipped for a three-minutes' service. The published accounts of the company for 1893 showed that the expenditure, including motive power, traffic, maintenance and general charges, amounted to 6.38d. per car-mile. The tramways worked satisfactorily both on the steep inclines and on the level. In an interview with the Lord Provost and several members of the tramways committee the deputation were informed that the Corporation had not contemplated the adoption of the overhead electric system. It was pointed out that Edinburgh was a great historical city,

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visited annually by thousands of tourists from all parts of the world; that its face was so much its fortune that it could not afford to risk disfigurement of the streets by poles and wires. With regard to cost, it was stated that they (the tramways committee) were informed that the initial expenditure on the cable system was exceptionally large, and that heavy traffic and an average three-minutes' service were essential for its success. They further stated that the additional slot rail necessarily created some difficulty for horses drawing heavy loads in getting proper foothold. The engineer added that where the traffic was heavy and the gradients 1 in 16 and 1 in 21 or thereabouts, congestion and serious difficulty would arise unless the streets were sufficiently widened to allow two vehicles to pass each other on each side of the tramway without having to pass over the slot rail, and it might be that the slot rail would require to be specially chequered on the upper surface. The magistrates and Council, however, have resolved to proceed with the cabling of the main trunk lines within the city.

Glasgow Undecided.

Glasgow was next visited. The Corporation of that city had fully considered the question of tramway traction, and their general conclusion appeared to be that horse haulage should there be discontinued as soon as possible; that compressed air, oil and gas motors had not been so far perfected as to make their adoption practicable, and that the city was well suited for the cable. The overhead electric system was objectionable for the heart of the city on account of its unsightliness, though it might do in the outskirts. The city authorities, however, had not arrived at a definite opinion as to the merits of the cable and overhead electric systems respectively. They believed that each had a merit, and that the special circumstances of the routes should be carefully considered before determining which system should be adopted.

Electricity in the Isle of Man.

The report also gives some details relating to the Brixton cable tramways, $2\frac{3}{4}$ miles double track. Here the cable is $3\frac{1}{2}$ inches in circumference, 30,000 feet long and weighs 30 tons. The service is the extraordinarily quick one of $1\frac{1}{2}$ minutes and the traffic phenomenal. The steepest gradient is about 1 in 22. The speed allowed is about 8 miles an hour, which they work up to as nearly as possible. The Isle of Man Tramways, which were inspected in August last, consist of a line of horse tramways along the promenade at Douglas, about 2 miles in

length, and a double line of electric tramways 7 miles long, being 14 miles of single track. This system is overhead, but instead of the trolley, a collector bar is used on each end of each car, the patent of Dr. John Hopkinson. It is, in fact, a railway and not a tramway. An important feature is the "cut-out" switches which are provided at certain points along the line, about three-quarters of a mile apart, with the result that in case of a breakdown by failure of current, &c., the section between the two "cut-outs" only is affected. There are two generating stations, one at Douglas and one at Laxey, each end of the route. Another specialty is the accumulator station at Groudle, which contains a battery of 240 cells. From this station 100 horse-power can be supplied for $4\frac{1}{2}$ hours, or 50 horse-power for ten hours. Sometimes the company have supplied as much as 150 horse-power for a short time from this station. The cells are always automatically charging or discharging, according to whether the generating station is making sufficient electricity or not for the motors running on the lines. This arrangement of storing surplus power enables the company to run their engines and dynamos at nearly full load for the whole of the day, and in this regard effects a saving in the consumption of fuel. The cells are of a new type (the chloride), and it is claimed for them there is only a loss of electricity of about 20 per cent., and that this is more than covered by the increased saving in coal and wear and tear of plant.

Brussels and Havre Accept Overhead Wires.

At Brussels the committee found a very complete and well laid out sample of the Thomson-Houston overhead system. There are two lines electrically operated, having a total length of about nineteen miles, and a total of thirty-five motor cars, each one of which takes a trail car. Before the introduction of the electric system a large portion of the line was worked by steam, and although the municipal authorities at Brussels opposed very strongly the introduction of the overhead wires, yet the Belgian Government and public opinion caused them to give way, and the satisfaction now given is very great. Inside the town itself the overhead wires are mostly fixed on steel posts with arms carrying the trolley, so that there is very little cross suspension. Outside the town, in places, wooden posts are used. The trolley wire is cut into sections electrically so as to separate each quarter mile. This is a great convenience, and enables repairs and other work to be done without affecting the general working of the line, and is of much importance in case of fires along the route. The feeders are

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carried under the ground, and are tapped into the trolley wire at frequent intervals, thus keeping the pressure very constant. Lightning arresters are used along the line, and have proved useful in several severe storms. The electric system fulfils the requirements of the public much better than the steam trains. At present the electric cars run every fifteen minutes in each direction. In the city itself the service is much more rapid, cars following one another at intervals of four minutes. The increase of traffic since the lines have been opened is very considerable, amounting to 100 per cent. Along parts of the road the speed reaches sixteen miles an hour, and the gradients are steep, amounting in one case to 1 in 16. The actual cost of traction (power and maintenance) is 1'79d. per car mile for one concern, and 2'78d. for the other line.

At Havre is one of the most complete examples in Europe of electric traction on the Thomson-Houston overhead system. The whole of the network of the Havre trams, which was originally operated by horses, is now electrically equipped. There are forty motor cars, each divided into first and second class, and each car has a carrying capacity of fifty passengers. The cars are fitted up in very good style. They run smoothly and quietly, and are lighted electrically. In the narrow streets the wires are suspended over the track by cross wires of steel, fixed in some cases to ornamental brackets let into the walls of the house, and in other cases by steel posts. In the broader boulevards there are centre posts with ornamental arms on each side carrying the trolley wire, and electric lamps are placed on the top of every other post. The effect is extremely good. The posts are 29 feet long, sunk into the ground 6 feet 6 inches. There are about 560. Of this number 85 have arc lamps on them lighting about 4½ miles of thoroughfare. The equipment of the lines was completed in July last, but in September the number of passengers carried was double that in the corresponding month of the previous year, when horse traction was used, and the contractor's guarantees as to running costs were, it was stated, more than realised. The actual cost of traction per car-mile is 3'37d., and the receipts 11'2d.

The Roundhay Tramway.

Some interesting details with respect to the working of the Roundhay Tramway on the Thomson-Houston system are likewise given. The installation consists of a generating station at Burmantofts, where engines and dynamos are placed capable of giving out 180 effective horse-power. The electrical horse-power required for a whole working day averages twelve

per car. There are five cars running. Each of the cars is fitted up with two 15 horse-power electrical motors. The difference between the actual horse-power required to work a car and the horse-power fitted to a car is caused by the power required to start the car on the severest gradient. This difference also accounts for the generating power at the station having to be so much in excess of the average requirements of the cars. This drawback has been lately largely surmounted by improvement in the electrical machinery on the cars. The weight of the motor car is 6½ tons. Those now being built are 5 tons. On busy days the motor car commonly pulls a trail car. The whole of the wires are overhead, supported by poles placed against the edging stones. The cars run about 7½ minutes' service. The installation was commenced on October 29, 1891. Since that time not a single wire has been broken or an accident or inconvenience suffered by any one by reason of the installation being an electric one. The accounts in accordance with the terms of the concession have been regularly audited by the Corporation auditor. It is claimed for this tramway that, like all other electric overhead installations, the traffic has increased more than it would have done by any other system. For the year ending November 10, 1892, the passengers numbered 720,069; from November 11, 1892, to August 28, 1893, 659,376; and for the year ending August 28, 1894, 931,055.

Relative Cost.

The cable in Birmingham cost in 1893 for 3½ minutes' service 6 32d. per car mile, not including capital and rearrangement expenses. The Roundhay electric for the last twelve months, 7 to 8 minutes' service, cost 5'76d. per car mile. Management and power station expenses include 71d. and 65d. per car-mile. In the large installation contemplated, this will be reduced 21d. and 32d. respectively, and the cost would then be 5'23d. Ordinary repairs on 35 miles single track, at 50d. per mile, on 2,429,084 miles, 17d., making the total cost per car-mile 5'40d.

Conclusions.

After considering the engineer's report most exhaustively, comparing it with the notes previously made by them, and reviewing the whole case, the committee have come to the conclusion that the present dual system of haulage, viz. by steam and horse-power, should be superseded; that oil, gas and compressed air are at present impracticable; and that having regard to the many different routes in Leeds and the total

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length thereof, the varying requirements of each route as to frequency of service, and the fact that the steep gradients are here uncommon, they are unanimously of opinion and recommend to the highways committee that electrical traction is the most suitable for the tramways of this city. They have not failed to consider the advantages of cable where the gradients are commonly steep and the streets mainly narrow, nor that cable is specially remunerative where the routes are short and thickly populated, thus rendering a frequent service practicable on all the lines equally; but these advantages only apply to Leeds to a very limited extent; and, on the whole, the committee's preference is decidedly in favour of electric traction, with overhead wires except in the centre of the city—say, from the junction of Briggate with Boar Lane to the Dispensary in North Street, to the junction of Hunslet Lane with Hunslet New Road, to Queen Street in Wellington Street and to the top of Park Row, and that within these limits an electric conduit system should be adopted. They do not close their eyes to the fact that objections may be made to both the overhead and conduit systems of electric traction, and that it will no doubt be contended by some that the former will seriously disfigure the streets. This, however, is not considered an insuperable objection, and moreover it is believed that great improvements can be made in regard to them by placing the feeder wires underground, and also by dispensing with many of the poles by fixing wires and apparatus to buildings (power to do which is being asked for in the Bill before Parliament), and possibly by placing such poles as are necessary against buildings (instead of at the causeway edge) in some cases, and in other cases in the centre of the roads rather than on both sides thereof. At the same time it may be practicable to utilise these posts for electric lighting by arc lamps, greatly to the advantage of the districts in which they may be placed.

Overhead electric traction will also avoid the danger to vehicular traffic caused by the extra metals required to form the slot along each of the two tracks for cable traction, it being impracticable in many parts of the city to allow the width of two passing vehicles on each side of the tramway. This difficulty will not, of course, be removed where the conduit system of electricity operates, which, however, would only cover about $2\frac{3}{4}$ miles in the centre of the city, where the streets are fairly level and of good width, out of the total of present and intended tramways of forty-one miles. The committee specially point out that whilst they are of opinion that the electric system has passed the experimental stage, it has doubtless not yet reached

the maximum of its possible advantages. Improvements are anticipated, particularly in regard to accumulators, which will be a great advance on the overhead system. This is a matter of considerable importance, as the capital expenditure upon electric traction will be much smaller than upon the cable system, and in case of any alteration, or the subsequent adoption of a new method of traction, will result in less loss than would be sustained by a change from cable haulage to that of any other.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

8947. William Rishworth, for "Improvements in locks and latches."
 9066. Daniel Edward Hipwell, for "Improvements in locks."
 9077. Edgard Barrachin, jun., for "Improvements in apparatus for facilitating the construction of brick arches for floors and the like."
 9135. James William Phillips, for "An improved window-fastener."
 9172. Benjamin Robinson, for "Improved means for securing closet seats to basins and of securing pedestal closets to the floor or other supports."
 9252. Samuel Smith, for "Improvements in and connected with window-frames and sashes."
 9271. Owen Williams, for "Improvements in door-fastenings."
 9283. William Henry Metcalfe and Frank Barber Wright, for "The manufacture of an improved artificial stone."
 9288. Sidney Stuart Morgan, for "Improvements in or connected with windows."

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"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

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As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

CONTRACTS OPEN.

ABERGAVERNRY.—For Building Residence, &c., and Pair of Semi-detached Villas. Mr. E. A. Johnson, Architect, Abergavenny.

ACTON.—June 6.—For Construction of Sewer. Mr. D. J. Ebbetts, 242 High Street, Acton.

AMERSHAM.—June 15.—For Building Villa. Mr. Guest Luckett, Architect, Granville Street, Aylesbury.

ABERYSTWYTH.—May 31.—For Building Four Dwelling-houses. Mr. J. A. Jones, Architect, Plascrug Lodge, Aberystwyth.

ALNMOUTH.—June 3.—For Enlargement and Ventilation of Board School. Mr. M. T. Wilson, Architect, Alnwick.

ALNWICK.—June 10.—For Alterations to Infirmary. Mr. W. T. Hindmarsh, Alnwick.

ALVASTON.—June 8.—For Building Board School. Mr. A. Macpherson, Architect, Tenant Street, Derby.

BARKING.—June 7.—For Supply of 300 Yards 1½-inch and 100 Yards 2-inch Broken Guernsey Granite, and 400 Yards Kentish Flints. Mr. C. J. Dawson, Public Offices, East Street, Barking.

BATLEY.—June 5.—For Building Two Houses, &c. Mr. J. H. Brearley, Architect, Commercial Street, Batley.

BEDWELLTY.—June 1.—For Building Two Board Schools. Mr. W. L. Griffiths, Architect, 27 High Street, Newport, Mon.

BELFAST.—June 4.—For Additions to Bonded Warehouse. Mr. Henry Seaver, Architect, 128 Royal Avenue, Belfast.

BELFAST.—June 10.—For Construction of Steel Principal Roof at Terminus. Mr. R. B. Belfrage, District Engineer, Belfast.

BERMONDSEY.—June 5.—For Supply of 25,000 Wood Paving Blocks. Mr. F. Sumner, Town Hall, Spa Road.

BEXLEY.—June 12.—For Supply of Glazed Stoneware Pipes. Mr. E. Reeve Boulter, Bexley Heath.

BIRMINGHAM.—June 6.—For Alterations to the Old Post Office. Mr. H. R. Potter, H.M. Office of Works, 12 Whitehall Place, S.W.

BOLTBY.—June 3.—For Building Wesleyan Church. Mr. Thomas Stokes, Architect, Thirsk.

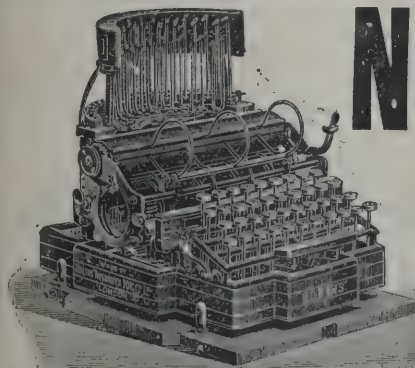
BOSHAM.—June 7.—For Erection of Board School Offices, Master's House, for School Board, according to Plans by Mr. N. C. H. Nisbett, Winchester. Mr. J. W. Loader Cooper, Clerk to Board, Emsworth.

BRADFORD.—June 1.—For Building Two Houses. Messrs. J. Young & Co., Architects, 62 Market Street, Bradford.

BRIDLINGTON.—June 4.—For Additions to 36 High Street. Mr. J. Earnshaw, Architect, Carlton House, Bridlington Quay.

BRIGHTON.—May 31.—For Preparation, Supply and Delivery of Cast-iron Lamp Pillars and Copper Canopies for Electric Light Arc Lamps, and Iron and Drawn Steel Bracket Posts for suspending the same. Mr. F. J. Tillotson, Town Hall, Brighton.

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BUCKS.—June 5.—For Brick and Iron Bridges at Crendon and Ditton Park. Mr. R. J. Thomas, County Surveyor, Aylesbury.

BURTON LATIMER.—June 4.—For Buildings for Gasworks. Mr. John T. Lewis, Engineer, Gasworks, Wellingborough.

CALSHOT CASTLE.—June 11.—For the Erection of Five Dwelling-houses, Detached Watch House and Boat House for Coastguard. Director of Works Department, 21 Craven Street, Strand.

CHELSEA.—June 4.—For Painting, Whitewashing and Cleaning at Infirmary. Messrs. Landell & Harrison, 12 Compton Terrace, Highbury, N.

CHISWICK.—May 31.—For Erection of a Postmen's Sorting Office. Messrs. Widnell & Trollope, 13 Parliament Street, S.W.

CLECKHEATON.—June 10.—For Building Sunday School. Mr. Reuben Castle, Architect, Westgate, Cleckheaton.

CLEETHORPES.—June 5.—For Building Two Houses. Mr. R. A. Robertson, Architect, 23 Osborne Street, Grimsby.

CORK.—June 1.—For Building Three Villas. Mr. J. M'Mullen, Architect, 30 South Mall, Cork.

CORWEN.—June 13.—For Erection of Buildings in Connection with the Workhouse. Messrs. John Williams & Son, Architects, Dee View, Corwen.

COUNTY OF MIDDLESEX.—June 4.—For Supply of 1,500 Yards 1½-inch Hand-broken Blue Guernsey Granite. Mr. F. H. Pownall, Guildhall, Westminster.

COVENTRY.—June 8.—For Cloakrooms, Lavatories, &c., Holy Trinity Schools. Mr. Herbert W. Chattaway, Architect, Trinity Churchyard, Coventry.

CRANLEIGH.—June 5.—For Building Two Detached Houses and Pair of Semi-detached Houses. Mr. William Buck, Architect, 60 West Street, Horsham.

CROYDON.—June 3.—For Building Dwelling-house at Union Infirmary. Mr. Frederick West, Surveyor, 23 Coombe Road, Croydon.

DENBIGHSHIRE.—July 1.—For Taking down and Rebuilding Upper Bedwell Bridge. Mr. R. Lloyd Williams, County Surveyor, Denbigh.

DONAGHMORE.—June 10.—For Alterations, &c., to Presbyterian Church. Mr. Hobart, Architect, Dromore, co. Down.

DUNDEE.—June 1.—For Building Post Office. Mr. P. Lawrence, 50A Frederick Street, Edinburgh.

DUNGLOE.—June 1.—For Improvements to Church. Mr. E. J. Toye, Architect, Strand, Londonderry.

EAST RETFORD.—May 31.—For Building Public Baths. Mr. D. J. Kennedy, Borough Surveyor, Retford.

EPSOM.—May 31.—For Excavating a Trench and Laying a 10-inch Permanent Suction-pipe at Waterworks. Mr. Fred W. Hodson, Engineer, Waterworks, Epsom.

ETON.—June 11.—For Supply of Thirty Fathoms Swedish Yellow Deals and Batten Ends. Mr. R. H. Barrett, Clerk to Guardians, Slough, Bucks.

EXETER.—June 4.—For New Wing to Hospital. Mr. Charles Cole, Architect, 50 High Street, Exeter.

FERNDALE.—May 31.—For Building 19 Houses. Mr. T. R. Phillips, Architect, Old Bank Chambers, Pontypridd.

FLEETHAM.—June 3.—For Rebuilding Lodge. Mr. J. Mitchell Bottomley, Architect, 28 Albert Road, Middlesbrough.

GREAT RISSINGTON, GLOUCESTERSHIRE.—June 8.—For Building Board School and House. Mr. W. Smith, Clerk to the School Board.

GREAT YARMOUTH.—June 1.—For Alterations to Fritton Schools. Messrs. Bottle & Olley, Architects, 5 Queen Street, Great Yarmouth.

GREAT YARMOUTH.—June 6.—For Building Residence. Messrs. Bottle & Olley, Architects.

GRIMSBY.—June 4.—For Building Three Houses. Mr. David Pick, 242 Cleethorpe Road, Grimsby.

HALIFAX.—May 31.—For Building Bank. Messrs. Horsfall & Williams, Architects, 15 George Street, Halifax.

HALIFAX.—June 10.—For Additions to School. Messrs. C. F. L. Horsfall & Sons, Architects, Lord Street Chambers, Halifax.

HALIFAX.—For Building Two Shops, Showrooms, &c. Mr. Medley Hall, Architect, 29 Northgate, Halifax.

HARWICH.—June 13.—For Building Board School, &c. Mr. J. W. Start, Architect, Cups Chambers, Colchester.

HINDLEY.—June 1.—For Additions to Schools. Messrs. H. Walls & Son, Surveyors, 8 King Street, Wigan.

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HULL—June 1.—For Additions to Schools. Messrs. Smith, Brodrick & Lowther, Architects, Hull.

KEIGHLEY—June 12.—For Building Infectious Diseases Hospital. Messrs. Judson & Moore, Architects, Burlington Chambers, Keighley.

KILBURN—June 1.—For Building Ten Cottages. Mr. John West, Chapel Street, Kilburn, Derbyshire.

LAUNCESTON—June 10.—For Building Residence, Stable, &c., St. Stephen's. Mr. Otho B. Peter, Architect, Launceston.

LEOMINSTER—June 5.—For Building School and Alterations to Chapel. Mr. E. G. Davies, Architect, 6 St. John Street, Hereford.

LEYTON—June 4.—For Construction of 9-inch, 12-inch and 15-inch Pipe Sewers, with Manholes, &c. Mr. Wm. Dawson, A.M.I.C.E., Town Hall, Leyton.

LLANDUDNO—June 17.—For Construction of a Cast-iron 27-inch Diameter Sewer Sea Outfall, Cast-iron Penstocks and other Works and Alterations. Mr. E. Paley Stephenson, A.M.I.C.E., Llandudno.

LLANFAIR CAEREINION—June 1.—For Additions to Board Schools. Mr. F. D. Ward, Architect, Welshpool.

LONGFORD—June 11.—For Building Sixty Artisans' Dwellings. Mr. Con Kenny, Solicitor to the Town Commissioners, Longford, Ireland.

MANCHESTER—May 31.—For Laying a System of Underground Telephone Pipes, with Brick Inspection Pits, Service Boxes and other Works in several Streets. Mr. Wm. Henry Talbot, Town Hall, Manchester.

MANSFIELD—June 10.—For Erection of Boundary Walls, Forming and Levelling Ground, Draining Paths, &c., at Cemetery. Mr. R. Frank Vallance, F.S.I., Mansfield.

MAYFORD—June 18.—For Erection of Recreation and Gymnasium Hall. Mr. H. De la Hooke, L.C.C. Offices, Spring Gardens.

MIDLETON—June 13.—For Building Twenty-five Cottages. Mr. Robert Walker, Architect, 17 South Mall, Cork.

MOUNTAIN ASH—June 3.—For Thirty-two Cottages. Mr. M. Morgan, J.P., Maesydderwen, Mountain Ash.

NETTLEBED—June 13.—For Additions to Schools. Mr. S. C. Johns, Architect, Wallingford.

NORTH FINCHLEY—June 11.—For Building Postmen's Sorting Office. Messrs. Gardiner, Son & Theobald, Great Russell Street, Bloomsbury, W.C.

PENTRE—June 7.—For Additions, &c., to Boys and Girls' School. Mr. J. E. Lash, Architect, 5 Temple Row, Wrexham.

PETERCULTER—For Public School. Messrs. Ellis & Wilson, Architects, Aberdeen.

PLUMSTEAD—June 5.—For Construction of Pipe Sewers. Mr. W. C. Gow, Engineer, Vestry Hall.

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PORTSMOUTH—June 12.—For Building Laundry, Boiler-house, &c., and Supply of Machinery. Mr. G. C. Vernon Inkpen, Architect, 6 King's Road, Southsea.

PURTON STOKE—June 4.—For Building School. Mr. W. H. Read, Architect, Corn Exchange, Swindon.

RICHMOND—June 15.—For Erection of Justices' Court-house and other Buildings. Mr. W. J. Ancell, Architect, 3 Staple Inn, London.

RIVER THAMES—June 5.—For Erection and Completion of Three Brick and Iron Bridges. Mr. R. J. Thomas, Exchange Buildings, Aylesbury.

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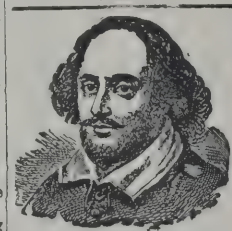
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ROMFORD.—June 4.—For Supplying and Laying Norwegian Granite Channelling and Kerbing. Mr. George Bailey, South Street, Romford.

ROWLEY REGIS.—June 17.—For Construction of Sewers, &c. Mr. E. B. Marten, Engineer, Church Street Chambers, Stourbridge.

SALISBURY.—For Pulling-down and Rebuilding Old Sarum House. Mr. Fred Bath, F.R.I.B.A., F.S.I., Crown Chambers, Salisbury.

SALISBURY.—For Rebuilding Business Premises. Mr. Fred. Bath, Architect, Crown Chambers, Salisbury.

SMITHFIELD.—June 11.—For Alterations to a Warehouse. Mr. G. K. Mills, G.W.R., Paddington Station.

SNELSTON.—June 8.—For Alterations to Chancel of Church. Mr. C. Hodgson Fowler, Architect, The College, Durham.

SOUTHEND.—June 5.—For Erection of a Crown Post Office. Messrs. Welsh & Atkinson, 10 Lancaster Place, W.C.

STAFFORD.—June 18.—For Providing, Laying and Jointing a 14-inch Cast-iron Rising Main of about 6,600 Yards Long, and about 450 Yards of 12-inch Main, to be Laid in the Parishes of Wombourne, Penn and Sedgley. Mr. Baldwin Latham, M.I.C.E., 13 Victoria Street, S.W.

STRATFORD.—June 10.—For Erection of Block of Buildings for the West Ham School Board. Messrs. J. T. Newman & Jaques, Architects, 2 Fen Court, E.C.

STRENSALL.—June 5.—For Building Wesleyan Chapel and School. Mr. Edward Taylor, Architect, 7 Stonegate, York.

ST. HELENS.—June 17.—For Building Central Co-operative Premises. Mr. F. S. Biram, Architect, Windle Chambers, Hardshaw Street, St. Helens.

SWANSEA.—June 20.—For Extension of Dock, Construction of Coffor Dam, Railways, &c. Mr. A. O. Schenk, Engineer, Harbour Offices, Swansea.

TOLLESBURY.—June 3.—For Enlarging National Schools. Mr. P. M. Beaumont, Architect, Maldon.

WADSLEY.—June 7.—For New Kitchen and Outside Staircases at Asylum. Mr. J. W. Cotterill, Wadsley Asylum, near Sheffield.

WALSALL.—June 5.—For Extension, &c., of Hospital. Messrs. Bailey & McConnal, Architects, Bridge Street, Walsall.

WAR DEPARTMENT.—June 19.—For Unexpired Portion of Triennial Contract in Southern District (Gosport). Lieut.-Col. H. R. G. Georges, R.E. Office, North Street, Gosport.

WEST HAM.—June 25.—For Erection of Block of School Buildings. Messrs. T. J. Newman & Jaques, 2 Fen Court, E.C.

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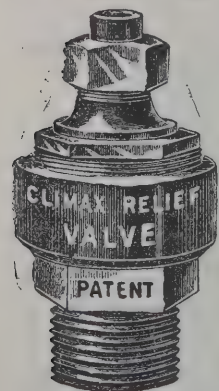
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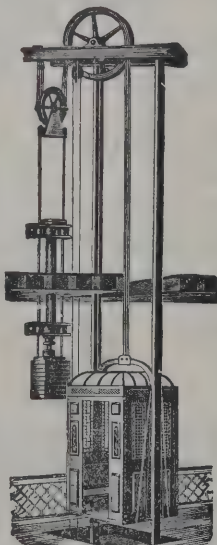
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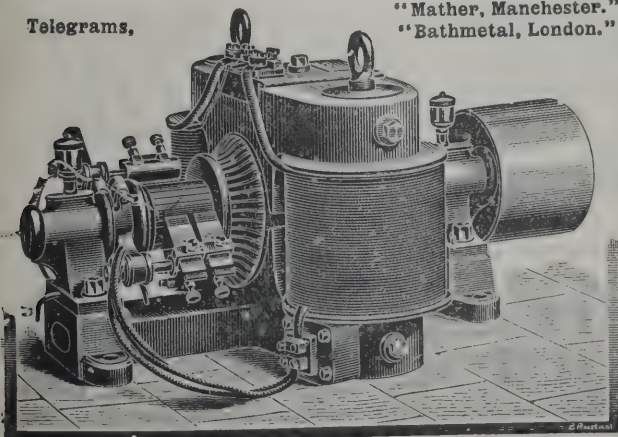
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For Building a Chimney Stalk at Laurel Works, Bervie. Mr. JOHN SIM, Architect, Montrose.

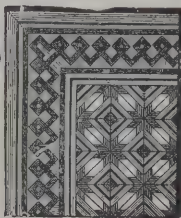
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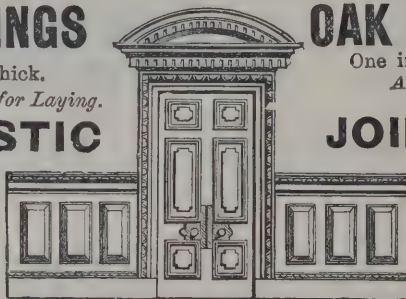


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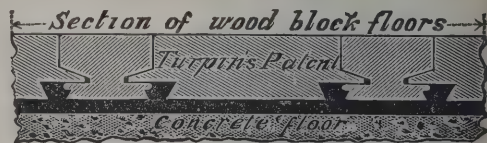
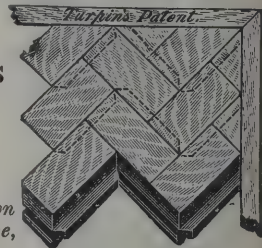
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W. PETTIFER (accepted)	599	0	0
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Architect.			
J. Main	£743	0	0
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J. E. Tate	660	0	0
G. Martin	621	0	0
W. PETTIFER (accepted)	600	0	0

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R. Brant, Leicester	1,294	11	2
W. Hall, Rugby	1,224	10	0
Patent Paving and Construction Co., London	1,213	5	0
E. Clarke, Melton Mowbray	1,140	0	0
PATENT VICTORIA STONE CO., Limited, London			
(accepted)	1,078	14	4

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R. Burlison & Co., Bishop Auckland	£1,166	15	11
J. Moore, New Shildon, Darlington	1,039	14	4
T. Hilton, Bishop Auckland	1,026	16	0
T. G. HENDERSON, New Shildon, Darlington			
(accepted)	998	0	0

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Brett, Harleston	£144	0	0
A. F. Raynes, Harleston	98	0	0
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For Building Workmen's Cottages at Cliffe Street and			
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and Quantities by Mr. C. F. WIKE, City Engineer.			
Walker & Slater, Derby	£805	0	0
Ash, Son & Biggin, Sheffield	773	0	0
J. Eshelby, Sheffield	710	4	0
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B. HOLLINSWORTH, Sheffield (accepted)	677	12	11
Surveyor's estimate	706	0	0

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the Congregational Church. Mr. ARTHUR PELL, F.S.I.,			
Architect, Beccles.			
Brock & Son, Alburgh	£382	0	0
G. E. Hawes, Norwich	344	0	0
J. W. STANNARD, Yoxford (accepted)	180	10	0

SWANSEA.

For Rebuilding Oxford Market, Swansea. Messrs. WILSON &			
MOXHAM, Architects, Swansea. Quantities by Architects.			
J. D. Williams, Knighton	£24,942	0	0
D. Jenkins, Swansea	21,400	0	0
Thomas, Watkins & Co., Swansea	20,605	0	0
Gustavus Bros., Swansea	20,442	0	0
Bennett Bros., Swansea	19,943	0	0

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Mr. HERBERT RICHES, Architect, 3 Crooked Lane, King			
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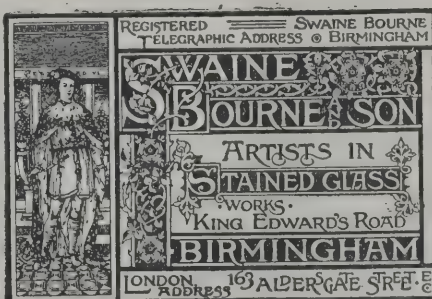
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Gale, Woking	£2,141	16	6	£338 0 0
Watson, Ascot	1,928	0	0	4c8 0 0
May, Guildford	1,896	0	0	404 0 0
Hunt, Chertsey	1,846	0	0	396 0 0
Harris, Woking	1,755	0	0	335 0 0
Gray, Egham	1,737	0	0	—
Rooke, Woking	1,672	0	0	299 15 0
SIMS, Basingstoke (accepted)	1,613	0	0	374 0 0

VARIETIES.

AT Market Harborough an inquiry has been held in regard of the application of the Urban District Council to borrow 2,500*l.* for the purchase of the police-station and premises at Little Bowden, for municipal buildings, &c.

A POLL of the inhabitants of Brentford, on the question of the erection of public baths in the town, has shown that a large majority are in favour of their erection.

THE *Engineering Record*, New York, records the death of Mr. Alexander Marshall in Pittsburg. He was educated as an engineer, and before coming to America was engaged in land reclamation work in Ireland, and on railways in Wales, Belgium and Russia.

THE same journal also announces the recent death of Mr. E. B. Cox, past president of the American Society of Mechanical Engineers, at the age of fifty-six years.

THE *Glasgow Herald* says:—The committee of the Glasgow Mauchline Society have issued a circular soliciting subscriptions amounting to 2,000*l.* or 3,000*l.* for the erection of cottage homes as a memorial of Burns on a site very near Mossiel Farm. There is to be accommodation for six free tenants, who must belong to the respectable and deserving class.

THE Paris correspondent of the *Standard* says:—The report of M. Picard, the Commissary-General of the Universal Exhibition of 1900, has just been communicated to the Press. It is a very long document, describing the main features of the coming international show. It will cover about 97 acres of ground, and have its principal entrance on the Cours la Reine, Champs-Élysées. The cost is estimated at 100,000,000 francs, of which 20,625,000 francs are put down for the palaces and other minor constructions in the Champs-Élysées, and 24,320,000 francs for the palaces and constructions on the Esplanade des Invalides, the quays, the Champ de Mars and the Trocadéro.

THE work of constructing a new lake contiguous to the river Clwyd at Rhyl, which has been in progress for the past twelve months, entered upon its final stage when the valves of one of the culverts were opened, and water allowed to enter the lake for the first time, in the presence of the members of the Council and many of the general public.

THE *Daily News* says the Victoria Embankment is now again open from end to end. It has been blocked in sections ever since the break-up of the great frost, and its repair has been an exceptionally heavy undertaking. The road presents a surface of 48,000 square yards, and to keep it in repair costs on an average 3,000*l.* a year.

THE Calverly School Board propose to build new schools and make additions and improvements to others at Farsley, near Leeds.

THE works committee of the Dundee Town Council have discussed the subject of new buildings in regard of premature occupation. The burgh engineer has been instructed to prepare draft by-laws relative to the premature occupation of new buildings and kindred matters applicable to buildings both new and old.

**ART PLATES FROM "THE ARCHITECT."**

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TRADE NOTES.

THE contract for the third section of the Belfast Corporation's water scheme, the price being 140,000*l.*, has been secured by Mr. Alexander Gall, contractor, Alloa.

AS requested by the Ayr Town Council, Mr. John Eaglesham has submitted plans and specifications of a proposed new drainage scheme for Ayr. The estimated cost is 33,405*l.*, of which sum 11,051*l.* is for main concentration sewers or outfalls, which may be largely dispensed with.

THE new Sanatorium, Tunbridge Wells, is being warmed and ventilated throughout by means of Shorland's patent Manchester stoves with descending smoke-flues, patent Manchester grates, patent exhaust roof-ventilators and vertical inlet tubes, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

ELECTRICAL.

THE Ayr Town Council have agreed to extend the trunk wires to Alloway Place and Miller Road, which are beyond the compulsory area, and resolved to introduce the electric light into the municipal buildings.

THE electric light is to be adopted at Windlestone Hall, co. Durham, the seat of Sir W. and Lady Eden.

A SCHEME for the construction of an electric railway between Derby and Ashbourne is being prepared. The towns are only thirteen miles apart by road, but the present route by the North Staffordshire Railway is thirty miles. The new line would make the famous Dovedale more accessible.

AT a meeting of the Chester electric-lighting committee it was resolved to recommend the Council to accept the contract of Messrs. Parker, Limited, of Wolverhampton, to provide the city with an installation of the electric light, and to proceed with the work at once.

BUILDING AND BUILDERS.

IN connection with the Leighton Buzzard water and sewerage works the foundation-stone of the water tower was laid on the 23rd inst. by Mr. W. S. Page, J.P., chairman of the Urban District Council. At the ceremony a silver trowel, suitably inscribed, with gavel, was presented by the engineer, Mr. H. Bertram Nichols, A.M.I.C.E., of Birmingham. The ground floor of the tower will contain, besides the two engines for raising the water from the well to the tank above, two engines and air-compressors for actuating the ejectors in connection with the sewerage system. The contractors for the works are Messrs. Garlick & Horton, Limited, of 43 Sloane Street, London, S.W.

THE Ayr Town Council have decided to extend the Esplanade footpath to the head of the Low Green, and to build a wall to protect the Green at the part where it suffered from the storm in December last.

THE strike in the Leicester building trades, though now in its ninth week, so far as carpenters and joiners are concerned, shows no prospect of settlement. The plumbers are still locked out, and they decline to return to work on the terms offered, although promised all that they demanded within a week of resuming work. The builders, bricklayers, plasterers and slaters have up to the present declined to accede to the demand for a general strike, but all building operations are being seriously interfered with, and the employers threaten to introduce non-union labour.

AN inquiry has been held at Sowerby Bridge as to an application to borrow 6,000*l.* for gasworks extension on the present site. This is a modified scheme, taking the place of a much more costly one known locally as the Holmes scheme. Mr. R. W. Evans, clerk for the district council, stated that they thought the scheme contemplated adequate for some years to come. They were about to carry out a sewage scheme at an estimated cost of 20,000*l.*, and they thought it inopportune to undertake a large gasworks extension in addition. The storage capacity would be increased from 395,000 to 637,000 cubic feet.

AT Westhoughton preparations have been commenced for putting in the foundations for the new church of the Sacred Heart at Sylfield, Westhoughton, the contract for erecting which has been given to Messrs. E. & D. Maginnis, of Bolton. Mr. Thomas Burgess, of Haigh, is the architect.

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MINING SUBSIDENCES IN THE BLACK COUNTRY.

DURING the last few weeks, says the *Birmingham Post*, there has again been brought prominently before the public the wholesale damage to property by mining operations within that portion of the Black Country subject to those extraordinary specimens of the legislative wisdom of the period when George III. was king, known as the "Dudley Wood and Pensnett Chase Enclosure Acts." The agitation in favour of some redress, or a limitation of the extent of possible future damage, has this time been set in motion by the District Council and the property-owners of Quarry Bank, where a most serious and painful state of things has been brought about by mining operations. Here and there outside walls are either bulged in or are cracked from basement to roof, window-frames are distorted into all sorts of fantastic shapes, ceilings are "bagged," floors are "raised," and, in not a few instances, roofs are laid open to the sky. The demolition of property has been greatest, and has perhaps entailed the largest amount of suffering, at Stour Hill, where no less than seventy families have of their own accord made good their flight from the impending danger or have received notice from Lord Dudley's agent to leave their houses to avoid personal injury. The misfortune falls upon these tenants unexpectedly, as a general impression had hitherto prevailed that, owing to an up-throw fault, as well as former mining operations, the neighbourhood of Stour Hill was safe for building purposes, and this, probably, accounts for the greater amount of property here compared with any other area of similar size in the parish. The geological structure of the neighbourhood points, it is said, to a more disastrous result than has ever been experienced in the district from any previous mining operations, and the surveyor to the District Council anticipates that over 30,000*l.* worth of property will be ultimately affected, in which case there must be a general exodus of the inhabitants, and a thriving little township will sink into decay.

Quarry Bank has suffered severely, and is likely to be subjected to further hardships. Only a short time ago the Dudley Town Council received a communication from Sir Benjamin Hingley, M.P., respecting the dangerous condition of no less than sixty houses in one street at Netherton, which, he stated, he was not prepared to guarantee "standing for an hour." The investigations of the borough surveyor showed that Sir Benjamin's fears were only too well-founded, and the possibility of

the whole of these tenements collapsing or disappearing into the bowels of the earth whilst occupied roused the Council to a sense of their responsibility in the matter, with the result that all the tenants received notice to quit. Unfortunately, the houses in Griffin Street, where the tenants were subjected to this form of eviction, were only a type of the condition of the majority of dwellings in this thickly-populated district, constituting as it does a veritable town in ruins, so general are the evidences of wreckage and damage. Dwellings intact are almost a novelty, except in a few streets where residences have had to be rebuilt, or in the very rare instances where the mines have been purchased by the property-owners. To these exceptions must be added a number of secure-looking houses on an eminence in the locality, which are sometimes pointed out to the inquirer as the effects of the determined opposition to the Enclosure Acts by a property-owner who was living at the time they received Parliamentary sanction. Extending to Primrose Hill and Darby End a scene of wholesale wreckage and dilapidation exists, the living-rooms in several instances having sunk to such an extent as to make it easy for a pedestrian to gaze into the bedrooms, some of which are just on a level with the thoroughfares. At Brockmoor, Pensnett, Hart's Hill, Woodside, Old Hill and other neighbouring places much the same condition of things exists, although, perhaps, not to such a serious extent as at Quarry Bank and Netherton. The kitchen floor of a house at Brockmoor suddenly collapsed some time ago, depositing several of the inmates in the cellar, but, happily, no loss of life resulted. The process of destruction is slow and sure; but it is exceedingly rare for a house to completely collapse without plenty of warning being given, to which fact is mainly attributable the comparatively insignificant amount of personal injury sustained by the occupants. The owners of the damaged property are for the most part people in humble circumstances, to many of whom the ruthless rending asunder of bricks and mortar has involved the loss of a life's earnings, whilst to not a few it has meant utter ruin. At the time of the passing of the Acts most of the land which is now densely populated lay waste. The mines underneath it were supposed to belong to the lord of the manor, and, according to the promoters of the Acts, it was then found to be almost impossible to work them without some reservations. The property owners, with few exceptions, consented to the provisions of the Enclosure Acts. The measures not only gave the lord of the manor power to do anything he liked with the coal underneath the enclosed areas; but, as is stated

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in the preamble of the Bills, he was entitled to "soil underneath the common water, land and other things." The Acts enabled the lord of the manor and his lessees to work the mines without being liable to compensation; but, as a kind of set-off to those almost unrestricted privileges, there is a clause stating that they must "do as little damage as may be." It is true the Acts propose a method by which compensation may be obtained, but it is surrounded by insurmountable difficulties. The clause dealing with this matter states, in effect, that any person suffering from mining operations may bring his grievance before two justices of the peace, and on his proving that damage has been done they could make a rate on all the colliery-owners on the Chase to the amount of the damage, including the cost of making and collecting the rate. With but one exception this piece of machinery for obtaining redress has never been set in motion. In 1858 one "Jerry Thomings" endeavoured to put the rating provisions of the Act into force, but the colliery proprietors opposed tooth-and-nail the granting of the rate by the justices, rendering it necessary for an application to be made to the Court of Queen's Bench for a mandamus to compel the justices to sign the rate. The mandamus was obtained, and the owners then appealed to the Quarter Sessions against the rate. Jerry was again successful, but his legal triumphs do not appear to have done him much good. Some say that the rate being confirmed the persistent Jerry was about to collect it, when the opposing parties, who were threatening a still further appeal to the higher courts, made an offer of a compromise by payment of a lump sum, which on the advice of his friends he accepted; whilst others affirm that the rate having been levied, it was discovered at the last moment that the machinery indispensable to collecting it was wanting, and that the whole case collapsed, swamping poor Thomings in heavy law costs. The attitude of the colliery proprietors with regard to the rate has not changed in the least, and the property owner who would undertake the task of enforcing this method of redress would be confronted with the same or even more determined opposition than that with which Thomings had to contend. But the obstacles which surround litigation were slight compared with those which would have to be encountered if litigation were resorted to as a remedy for existing evils. It is seriously argued and not without a considerable amount of force, that if an Act was passed compelling all mine-owners to compensate for surface damage the aggregate demand would be so enormous that the only alternative would be the closing of the mines. Assuming this contention to be correct, the result would be

that a large proportion of the 'people would be thrown out of employment, because other important industries would suffer by the closing of the mines, and with the decline of local trade and the houses and works tenanted the last state would be worse than the first. It is, however, the opinion of many in favour of compulsory compensation, that owing to the value of the coal still remaining means would be devised to extract it without so much damage to the surface as at present, and that even if this were impracticable the average colliery proprietor would after making ample reparation and meeting all expenses, including royalties, still leave a respectable surplus for profit.

Apart from the overwhelming legal difficulties surrounding the matter, the whole question of compensation is beset with great and conflicting interests. On the one hand, there are the interests of the miners, the ironworkers, and the interests of all who desire that the collieries of the district should be worked thoroughly; and on the other hand, the interests of the owners of the houses. Indeed, the more the question of legislative compensation is considered, the greater appears to be the difficulty of constructing any general scheme which would deal out even-handed justice all round. If redress, either by litigation or legislation, is impracticable, what then are the people who now suffer by the damage caused by mining operations under the Enclosure Acts to do? In other parts of the district outside the areas of the Acts, and where the lord of the manor is subject to common law, the custom is for his lordship to erect a new house for every one destroyed. The varied character of the lessees, and the disparity of the conditions under which some of the mines are worked, make it hopeless to expect that so complete an act of reparation as that referred to will ever be generally adopted within the enclosed areas. Some arrangement, however, might be arrived at between the owners of the collieries and property owners, by which the former might agree to contribute a proportion of the cost of keeping damaged houses in repair, and in cases where they are completely destroyed afford facilities for the re-erection of cottages on land free from mining operations. The property owners might put their grievances into definite shape, and a private Bill might be carried through Parliament compelling all colliery owners to abstain from removing ribs and pillars, and also an undue clearance above and below them, the inevitable effect of which would be to minimise the extent of future damage. A Government inquiry into the working of the Acts might also have a beneficial effect. The Earl of

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Dudley, who in his speech at Worcester practically admitted his moral obligation, has shown himself to be of a generous disposition, and it is not at all improbable that if his attention could be closely drawn to the wholesale wreckage to property, something would be done to alleviate extreme cases. The whole question is again exercising the minds of those interested, and the time appears to be ripe when something should be done, if not to provide some substantial redress, at least to limit the extent of damage in the future.

CEDAR FORESTS IN ALGERIA.

THE Government of Algeria, says Consul-General Playfair, in his last report, is anxious to direct public attention to the forests of the colony, especially to those of cedar and cork oak. It has published two brochures on the subject which are beautifully illustrated and contain much valuable information. The first of these treats of one of the most attractive features of the mountainous regions in the departments of Algiers and Constantine, a never failing source of interest and pleasure to the traveller, but hitherto of no great commercial importance.

The cedar of the Atlas is a variety of that of Lebanon, *Cedrus Libani*, var. *Atlantica*. It occurs at an altitude of from 4,000 to 6,000 feet above the level of the sea, in the Aurès Mountains; in the Belezma, near Batna; at Ben Thaleb, south of Setif; in Babor and Ta Babort, between Bougie and Djidjelly; in which locality it is associated with a magnificent conifer, peculiar to Algeria, the Atlantic *Pinsapo*, *Abies Pinsapo*, var. *Baborensis* (Cosson). In the Department of Algiers it is found in the Djurdjura range; on the hills above Blida; in the Ouaransenis and at Teniet-el-Ahd. Many Alpine plants are associated with it, such as the *Taxus*, *Ilex*, *Prunus*, *Sorbus*, *Juniperus* and *Rhamnus*, various species of oak and flowers of great beauty.

The forest of Teniet-el-Ahd, being easy of access, was treated in the most ruthless manner by the military in bygone days, before the Forest Department was properly organised. Trees were cut down and allowed to perish on the spot. Dead wood and dry grass produced fires which threatened the very existence of the forest, and the Arabs were in the habit of burning the old grass to produce fresh pasturage for their flocks. Now the utmost care is taken of this forest, and its regeneration is rapidly taking place. Young trees are everywhere springing up, and though wood of average dimensions is

still insufficient, that is a want which will disappear in time. The foregoing remarks apply more or less to every other cedar forest in Algeria.

Great destruction took place in the forests prior to 1884, owing it is said to unusual and excessive drought, and in a great measure to the attacks of caterpillars. I may quote my own observations regarding this destruction of cedar trees, written in 1875. "We passed through woods and clumps of cedars in which there were more dead than living trees, some still erect, others torn up by the roots, bearing evidence to the violence of the storms which prevail here in winter. These become more and more mixed with living trees as the traveller descends, till the dense forests on the lower slopes (of Chellia) are reached. But even here destruction is doing its work, principally owing to numerous communities of hairy processional caterpillars, which spin a web-like nest on the higher branches, destroying all vegetable life as their ravages descend."

I cannot state from personal observation what the present condition of the forests in the Aurès Mountains may be; I have not visited them since the foregoing was written; but that of Djebel Touggourt, a favourite excursion of tourists from Batna, is in a most deplorable state, and it looks as if it might almost cease to exist in twenty years hence. The whole surface is covered with trees which have been torn up and allowed to perish; very few young trees are springing up; caterpillars are everywhere at work, and there seems, to the casual observer at least, to be no efficient supervision. It is calculated that there are 35,000 dead trees still standing, and one person has purchased the right to cut these down within two years, and to supply 100,000 railway sleepers for the Est-Algérien line.

The ruinous system of granting forest concessions, which formerly existed, has ceased. The trees are now felled by the Forest Department, and the timber is sold by public auction. The quantity thus disposed of in 1892-94 was as follows:—

Year.	Quantity sold.	Amount realised.
	Cubic mètres.	Francs.
1892	10,506	48,000
1893	6,173	25,070
1894	10,983	41,820

Cedar-wood is said to be somewhat less enduring and



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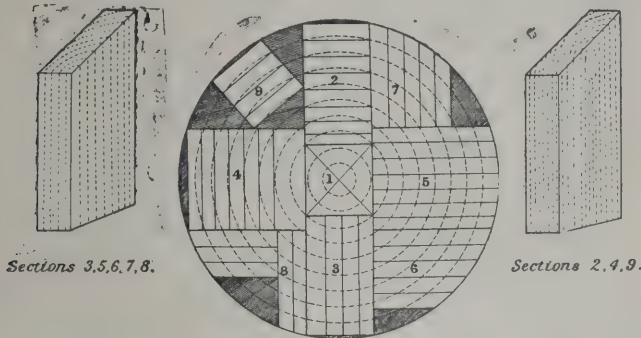
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elastic than pine from the north of Europe, and therefore requires a rather larger scantling when used for architectural purposes; but these objections have been found to exist more especially in timber containing the heart of the tree. Now its nature is better known than it used to be, the heart is generally employed for railway sleepers, and the outside portions for carpentry. Sleepers thus made have been found to last from eight to ten years, and to require no injection; it has also been employed with good results for wood pavement and shingles. But it is especially for cabinet-making and decorative purposes that cedar-wood is most valuable, and for such purposes it is advisable to saw the wood so as to get rid of the heart altogether, and to cut up the outside portion so as best to display its beautiful and irregular veining.

This is best explained by the annexed plate. The heart is first removed by two cuts of the saw. This is again divided into three sections—1, 2, 3. No. 1 can only be used for railway sleepers. The rest of the timber is sawn up as indicated



in the plate, according to the appearance of the wood, its veining, colouration, or the purpose for which it is required.

The forest of Teniet-el-Ahd has an area of 2,325 acres, and it contains a considerable number of trees that might fairly be used; but to regard it only in the light of a source of revenue would be unworthy of the Government; the giants of the forest there are of incomparable beauty and incalculable artistic value. This forest is a favourite resort of travellers, and it is gratifying to know that the Government is resolved to exploit it only in the most legitimate manner by a system of rotation, so as not to destroy its great beauty.

The means at present employed of felling the trees and cutting up the timber by hand is too expensive. There is not sufficient water-power to drive a saw-mill, and there is no other resource but to employ steam-power. Till that is done, and means of communication are improved, the cedar forests can hardly be expected to prove remunerative. But the amount of timber available in the various forests is so great, that when these difficulties are overcome, it will be a source of great riches to the colony.

LEVEN BRIDGES AS INVESTMENTS.

A CORRESPONDENT of the *Glasgow Herald* supplies the following remarkable account of the profits which are to be derived from bridges in rural districts:—

Wednesday, the 15th inst., will be a red-letter day in the annals of the Vale of Leven. At noon on that date the pontages on the bridges at Bonhill and Balloch ceased, after having been levied for well-nigh sixty years. Patiently have the inhabitants borne the tax—a tax which to many families became in the course of the year a second rent. But although patiently borne, the impost was invariably paid with reluctance and a feeling of injustice. The amount levied during these years at Bonhill Bridge could not be less than 80,000*l.* In a public record it is stated that from the time of the erection of the bridge down to the year 1882, Mr. Smollett, the proprietor, had received—over and above the cost of the erection, and every disbursement connected therewith—a sum of 30,000*l.*, and in 1884 he was awarded 28,000*l.* as compensation money in lieu of any rights he possessed. The first cost of the bridge was only 2,200*l.*, and few investments have yielded such a return. Fifty years ago the combined annual income of both bridges was under 500*l.*; when last put up to auction they commanded 2,450*l.* As already stated, although the tax was borne patiently, there was always an under-feeling of injustice at the imposition. At intervals during these sixty years this under-current came periodically to the surface. To understand how this feeling was engendered it is necessary to study “the bridge question,” as it is locally designated. Prior to 1836 transit over the river was effected by ferry boats—a tedious and at times dangerous mode of conveyance. When the river was swollen and the current strong it was no uncommon experience for the chain of the boat to snap. This meant either a casualty or a journey down the river for the occupants. Under the Act of 1807 the Road

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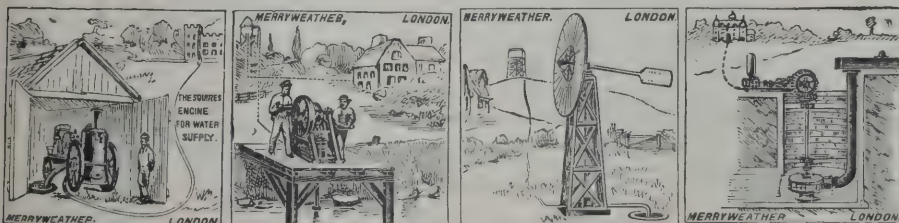
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Trustees had special powers to erect a bridge, but failed to meet the needs of a growing population. In 1828 these powers were renewed and strengthened, but the trustees remained dormant. In 1833 a petition signed by 1,300 inhabitants was presented to Admiral Smollett, of Bonhill, the proprietor of the ferry rights, craving him to substitute a bridge for the now inadequate ferry. The Admiral took the matter up, was authorised by the Commissioners to erect, but on account of some informality he abandoned the idea. It has been held that at this time (1833) the Commissioners, in granting the authority they seem to have granted to Admiral Smollett, were acting *ultra vires*, and this opinion is strengthened when it is seen that the following year, in 1834, they received statutory powers to contract with the proprietor of the ferry for the erection of a bridge "on an assignation to the tolls and duties until the trustees should redeem the right so assigned by making payment to the proprietor of the value of the bridge erected, together with the value of the ferry." This limitation of the pontages, at any rate, was not a stipulation of the previous Act. Admiral Smollett came forward again, and intimated that he was prepared to erect a bridge under the Commissioners' previous warrant. This was confirmed, and the handsome "suspension" which does duty to-day was built. By allowing the erection of the bridge in this way it did not seem to strike the Commissioners that they were laying on the inhabitants what appeared to be a perpetual burden. It might, on the other hand, have turned out a bad speculation for Smollett, and had the public refused to pay pontages Smollett would have had difficulty in proving his title. As it was, the public felt the benefit of the bridge, and gave recognition thereof to the proprietor. About the year 1850, however, some enterprising inhabitant who digested the circumstances of the pontages came to the conclusion that the dues could not be enforced, and put his opinion to a practical test. The task of "walking the bridge free" was conferred upon one Steel, an advocate, who made a successful *début* and met with no opposition. But the public, instead of giving Smollett the opportunity of suing them, became themselves the aggressors in litigation, summoning the proprietor in 1852 for an accounting of the pontages. The action was taken up entirely on erroneous grounds, and the plaintiffs retired defeated. The general feeling is that the Road Trustees at this period were very lax in the matter, and by the powers which they possessed might have enforced an accounting and abolished the pontages. Enthusiasm seems to have died out

until 1878, when an Act for the vesting of certain bridges in Road Trustees and for the cessation of pontages was before Parliament. Some dubiety existed in the minds of the community as to whether or not Bonhill and Balloch Bridges would come within the scope of the Act, and accordingly a letter was sent to (then) Mr. Arch. Orr-Ewing, M.P. for the county, praying for their inclusion. This was effected, and some years later arbitration proceedings began in connection with the amount of compensation to be paid to the proprietors of the bridges in question. A movement was also initiated with a view of collecting the necessary arbitration amount and settling the "vexed question" once for all. But this movement proved abortive, save that it was the means of raising several separate sums, amounting in all to about 100*l.*, and which has only now been utilised. It was at the time of this movement that the feeling of the people against the pontages took the form of a riot. It is, indeed, the only "bridge riot" worth citing. A public meeting regarding the impost was dispersing from Alexandria Public Hall. A large contingent had been present from Bonhill, and naturally in crossing the collector came in for "remark." It only wanted a spark to set the crowd "ablaze." Some words by the collector and the interference of the police led to a general tumult. It was an opportune hour for such an occurrence—11 P.M. The heads of the collector and officers of the law were the targets for anything and everything, from a "divut" to a brickbat, and matters got so warm for these gentlemen that they accepted the inevitable and beat a hasty retreat. Demolition followed. The gates were wrung from their hinges and cast overboard; the suspension swayed like a tightrope. Advocates of the imposition were held in a state of suspended animation over the parapet and narrowly escaped a ducking. The bridge box was broken into fragments, and the booty—one shilling—was presented to a boy who had been most energetic in the devastation. Continuing the history, the necessary amount was not subscribed, and there was nothing for it but to pay out the proprietor—28,000*l.* for Bonhill and about 6,000*l.* for Balloch were the amounts awarded by the arbiters. This large sum, plus the cost of the new bridge at Balloch, has been almost entirely raised from bridge pontages and from taxation on proprietors, and a balance of 300*l.* is all that remains to be paid. The inhabitants of the Vale of Leven being aware of this, decided to raise by subscription that fractional amount rather than allow the pontage to enter on another year. The effort has been entirely successful.

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THE TEAK TRADE OF SIAM.

A REPORT on the teak trade by Mr. Black, the acting Vice-Consul for Great Britain at Bangkok, has been issued by the Foreign Office. It contains information derived during a recent journey. Mr. Black says :—

The teak-bearing forests of Siam lie in the north, and the most productive region at present may be included in a circle which, drawn round Chiengmai and Phree, encompasses all the head waters of the Me Ping, Me Wang (Lakon River) and Me Yom. The right bank of the Me Ping from the Me Layan, down to Klong Kong below Kampeng, is also a very productive district. Both sides of the range of hills here are scattered over with teak forests, the timber on the west side being floated down the streams to the Thoungyengh and thence into the Salween, and that on the east side into the Me Ping and finally to Bangkok. The nearest teak forest to Bangkok is situated on the head waters of the Mewong (Sa Kay Krang River). The majority of the posts and small timber used in local consumption comes from the Nam Pat above Utaradit. A quantity of teak is derived from Nan, but no reliable statistics are as yet forthcoming in regard to this district.

The forests on the west, on the Thoungyengh, are said to have been worked for half a century, and those in Chiengmai and Lakon as early as the fifties at least.

The Borneo Company, Limited, had agents in the north in 1860, but it has only been within the last ten or twelve years that the production of teak timber has reached important dimensions, a period which was initiated by the treaty of Chiengmai and the establishment of a British Vice-Consul at that place. This step was brought about by the serious disputes which the growing timber trade occasioned between Burmese foresters and the local chiefs and owners of forests, and the difficulty of ascertaining in Rangoon or Bangkok the true aspect of such cases.

The lessees of by far the largest proportion of the forests in Siam are Burmans, a few forests are leased by Siamese and a small one by a Dutchman, but practically nearly the whole of the extensive teak forests of Siam are in the hands of British subjects, either by virtue of original leases or by an arrangement for working, which is almost equivalent to handing over a lease. A lease is obtained from the owner of the forest, and is executed in the manner prescribed in the treaty of Chiengmai.

The Burmese lessee is generally a man of very small means,

and when he has obtained a lease by ingratiating himself into the good graces of the owner and the local authorities—a delicate matter, requiring a great amount of tact and *savoir faire*—he applies to one of the trading companies in Bangkok for the capital necessary to carry out the working of the forest. This is supplied to him in large sums at a high rate of interest, and on an agreement by which all his timber is taken over on the banks of the streams, or otherwise, at a fixed price. About half the capital is forthwith expended in the purchase of elephants. The best elephants in the teak forests of Siam cost from 2,500 rs. to 3,000 rs.; ordinary elephants, 1,000 rs.; and as many as fifty or upwards are required in some forests.

The balance of the capital is necessary for advances to coolies and for working expenses for three or four years, as that time generally elapses before any timber actually reaches the market.

The first operation in the work of a teak forest is girdling the trees. This is done by making an incision 8 inches broad by 4 inches deep all round the trunk at a height of 4 feet from the ground, generally when the tree is in flower. The sap is most abundant at that time of the year, and the tree dies sooner. A tree to dry properly should be allowed to stand three years after girdling, but after some days the tree is again cut into the heart by a deep incision on each side, and in a period of six months to a year the tree is fairly dry and is cut down.

It is a day's work for one coolie to cut down a tree and finish it off by lopping away all the branches. Then the elephant comes into requisition. He drags the logs into various little heaps in the forest, and thence they are again hauled into the small streams. It is here that the purchaser, as a rule, puts on his hammer mark.

As the subject of hammer marks enters largely into the question of timber stealing, a brief explanatory paragraph may be inserted.

There are various hammer marks :—1. Forester's hammer mark. 2. Forester's selling hammer mark. 3. The purchaser's hammer mark.

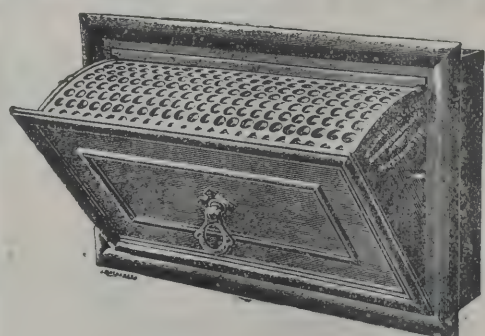
Foresters also have a rough jungle mark, which is made by cutting a rude cross or angle with the axe on the log. The hammer marks of one owner are not confined to a single design, but vary according to the fancy of the owner or purchaser, for timber cut in different divisions of the forest, or timber bought in different districts. One man may have as many as a dozen different hammer marks, and sometimes many more, when all



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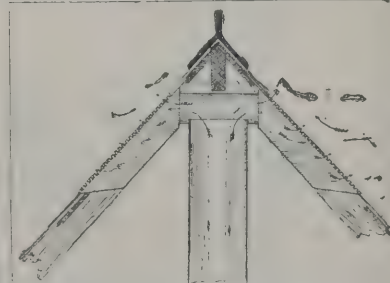
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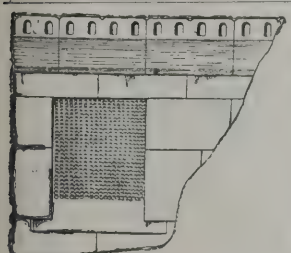


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The forester's mark is generally in the form of Burmese letters, and the purchaser's mark the initial letters of his name or company, such as B.C.L. (Borneo Company, Limited), B.B.C. (Bombay-Burmah Trading Corporation). The purchaser puts on his mark in the stream in the presence of the forester, and the whole upper side of the log is stamped with it to make defacing a work of difficulty. In addition to the royalty stamp, the log is thus marked over with the three different stamps above referred to, and the purchaser in addition stamps it with various private marks and numbers, when it is made up into a raft.

The logs lie in the streams till the rise of water in the beginning of the rainy season (May) floats them down to the Me Ping, Me Wang or Me Yom, as the case may be. There is generally not enough water in the small forest streams to float large teak logs continuously, and the elephant steps in again and performs the work, which has received the name of "hounding" from the Burmese. The timber gets stranded in the shallow places and sometimes it becomes piled up in immense heaps of two or three hundred logs. It is the elephant's business to disentangle this mass and float the logs off into deep water, a task which he performs with great skill. At the beginning of the season raftsmen are engaged, who go up the river to Ban Na, on the Me Ping, and to Whampia Cheng, on the Me Wong, and above Sawankaloke, on the Me Yom. They collect the timber as it comes down and form it into rough rafts, which are afterwards rearranged and measured at Raheng, on the Me Ping, and Sokotai, on the Me Yom.

Rafts are arranged in tiers or rows, and the logs are fastened together by stout rattan ropes fastened to holes cut in the ends of the logs. On the Me Ping the rafts contain, on an average, 150 logs, whereas the Sawankaloke rafts are smaller, averaging only 130 logs. The Me Ping rafts have generally ten logs in the first tier, which increases in the other tiers to sixteen, and then tapers off to ten again at the end. An outside row of logs serve as a fender, which can be cut adrift when the log collides with the bank or when there is danger of stranding at the side. This preserves the whole raft from being broken up. The Sawankaloke rafts are longer and narrower, beginning with a tier of six logs and increasing to ten. For a fender the outside rows slide endways into each other, and the whole raft is looser in arrangement than on the other river. The different character of the streams accounts

for the difference in arrangement of the rafts. The Me Ping is broad and shallow; the Me Yom is deep, narrow and tortuous.

The Sawankaloke rafts are fitted up with three large paddles as steering gear, but on the Me Ping the rafters have to remain in the water the whole day to steer the raft. Their gear consists of two stout rattan ropes, forty fathoms long perhaps, each fastened to a bamboo stake. To move the raft right or left one rafter sticks his bamboo stake into the soft sandy bottom and hangs on to it up to his neck in water till the proper adjustment of the course takes place. Steering gear by means of paddles is put on at Paknampoh. A raft takes ten or fifteen days to come down from Raheng to Paknampoh, and during that time the rafters are practically in the water the whole day. In another three or four days the raft reaches Cheinat, the duty station, where the up-country rafters stop and return. There are usually three rafters on a raft, and they get 7 salungs (2s.) a log from Raheng to Cheinat. From Cheinat to Bangkok, covered in from eight to ten days, rafting costs another 2 salungs a log. A raft comes down from Sawankaloke to Paknampoh in about ten days, and the rates for rafters are about the same as on the other river.

The rafting season begins in June with the rising water and timber floats down plentifully in July and August. For some time after that date the rush of water is too violent to float rafts in safety and sometimes the water is so high that the beds of the streams are unrecognisable.

There is danger then that a whole raft may float out into the rice fields, where it will remain stranded high and dry, an easy prey for timber thieves. In October, November and December, when the water is subsiding again, the greater portion of the timber is floated down.

Most of the timber stealing takes place in the Me Ping and the Me Yom above Paknampoh. When the rafters are collecting timber at Ban Na, above Raheng, a sudden rise of water may take place in one night. It is impossible to secure all the wood, and off it goes with the rushing flood and gets past Raheng, where coolies are on the look out, in the night perhaps, or by day if the water is very rapid. Hundreds of logs thus get stranded below Raheng, and the number is added to by rafts that are broken up by collision with banks or that are maliciously cut adrift, or are stranded accidentally. The timber thief is on the alert at this season. He picks up the logs, disposes of them by sale to the local sawyard, or, as is most generally the case, hauls them up to his own back yard, where, with

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the assistance of a friendly neighbour, they are cut into posts and planks, and are supporting the roof of a new house, or form the flooring of a new verandah, by the time the agents of the owner are searching the river for the lost timber. Or the logs are dragged into the jungle, where the property marks are burnt out or otherwise obliterated, and after a year or two they are floated down in the chance of not being recognised. Probably the majority of the logs are quietly sawn up by the thief himself.

In the absence of direct official supervision a great deal of theft takes place in a much more open way. A party of rafters go up the river, either of their own accord or instigated by native traders. They collect all the lost timber they can lay their hands on, and bring it down to Paknampoh or Cheinat. There it is purchased at a low rate by unscrupulous native traders, who know well that the timber is stolen. There are no regulations at present by which any official may detain suspicious timber on his own initiative, but the agents of the Borneo Company, Limited, and Bombay-Burmah Trading Corporation examine rafts at Paknampoh, and if they find any of their own timber in the rafts they cause it to be detained by the authorities and prosecute the rafters, or the owner if the rafters divulge his name. The defence of the accused is usually that they picked up the timber for salvage.

Foresters who have no agents at Paknampoh have little chance of recovering stolen timber. The British companies look after their own timber themselves as much as possible with the aid of efficient staffs, who search the river twice a year with elephants for the stranded timber. Even with these precautions the amount of their losses by theft is put down at from 3 to 5 per cent. The quantity of timber belonging to native buyers and small British foresters must considerably exceed this figure. A considerable amount of timber is also sold without authority by the rascally agents of foresters who are employed to pick up the timber which has been sent down. These agents are all Burmese, but the foresters have themselves to blame, of course, for their losses in this way.

Timber, to a small extent, is stolen in the streams by the servants of the foresters, or by others, and also below Paknampoh and Cheinat when a raft gets broken up. The logs are carried off, and are taken down one of the numerous creeks and branches into which the Menam splits up below Cheinat. A raft, however, does not often break up below Paknampoh. Rafters pick up any timber they find on the way down, sometimes *bona fide* for salvage, for which a sum of 1 tical per log has been fixed by custom, but more generally to dispose of it to

their own advantage. Timber stolen on the Me Yom is nearly all passed into the Menam by the Pak Pring Creek (navigable only in the wet season), and is used locally or cut up in one of the numerous sawyards.

To prevent this large loss by theft it is absolutely necessary that regulations for the control of teak timber in transit should be issued, and that they should be carried out by a separate staff of officials. The draft regulations appended to this report have been drawn up on the basis of the regulations of Upper Burmah, but have been considerably simplified to suit the altered conditions of government in Siam and the different customs of the trade. Every separate clause has been discussed with the managers of the British companies in Bangkok, and with a representative of Burmese traders, and their suggestions and alterations where practicable have been incorporated. These draft regulations, therefore, represent in a complete form the views of the British merchants as to the nature of the legislation required and the extent to which they are willing to confirm restrictions in the trade.

It has already been pointed out that the working of teak forests is to a very large extent in the hands of British subjects, but this is not the case with the purchase of the timber. From statistics which have been obtained from private sources it appears that British buyers represent about 42 per cent. of the business, natives (mostly Chinese under Siamese jurisdiction) 48 per cent, and a Chinaman under French protection 10 per cent. The British purchasing trade is almost entirely in the hands of the Borneo Company, Limited, and the Bombay-Burmah Trading Corporation, of which two firms the Borneo Company, Limited, is the longest established and has the largest interest.

To estimate the amount of capital which lies locked up in the teak forests is a matter of some difficulty, as it is of course impossible to ascertain the capital of each individual firm. But, roughly speaking, it can be calculated from the production. The average production of full-sized marketable logs, *i.e.* logs over 5 kam (21½ inches) in semi-girth, may be put down at, say, 60,000, and valued at 35 ticals a log, which makes a total of 2,100,000 ticals. A period of four years on an average elapses in the teak trade before any turnover is made—that is, capital invested now will not be realised till four years hence, when the timber is actually in the market. Therefore, multiplying 2,100,000 ticals by four, we arrive at 8,400,000 ticals (530,000 £), which is necessary to work out the logs which are brought down to the Bangkok market.



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Taking the average of the timber that floats into the Salween from Siamese forests at 40,000 logs, which is, if anything, below the mark, we arrive at another sum of 5,600,000 ticals (350,000*l.*). This sum, with the Bangkok capital, represents about 880,000*l.* invested in the teak forests of Siam. By far the largest proportion of this capital is British. The native-bought timber is estimated at 48 per cent., but the majority of these buyers do not advance money to foresters as British merchants do. They simply purchase the timber from year to year. The capital, therefore, is mostly in the hands of Burmese foresters, by whom the forests are principally worked.

The revenue which is derived by the Siamese Government from the teak business is a fairly considerable one. The duty is based on what is called the "pikat" rate, a standard of value by measurement, and averages 10 per cent. of the actual selling value of the timber. Timber is sold in Bangkok at so many times the "pikat" rate. Thus a log of 6 wah (39 feet) long and 9 kam (38½ inches) in semi-girth is valued at 10 ticals at the "pikat" rate. The market rate at present is 5 pikat, therefore this particular log will be sold at 50 ticals. The statistics here given regarding logs refer only to full-sized timber, viz. 5 kam (21½ inches) in semi-girth, as this is the only class of timber which is exported or which traders of any importance deal with.

In addition to this timber, a very large quantity of posts and saplings find their way to Bangkok, or are used on the way down the river. The largest proportion of these posts come from above the Pichai and Utaradit, where the business is in native hands.

The loss to the revenue and to the country in general is enormous by this indiscriminate destruction of valuable young trees. If the local authorities would enforce the conditions of the leases prohibiting the felling of trees under 5 kam (21½ inches) in semi-girth the practice would be checked in the Chiangmai, Lakon and Phree districts, but special regulations would appear to be necessary in the districts above Pichai and Utaradit, where such leases are not in vogue, and where natives work on simple permits received from the local chiefs.

The total number of logs which passed the duty station at Cheinat in 1893-94 was 109,957; of these 72,930 were full-sized logs, which leaves the number of undersized logs at 37,027.

The best class of this small timber, say a log less than 5 kam (21½ inches) in semi-girth and 4 wah (26 feet) long, is worth 5 ticals. In thirty years' time this log would

have increased to 9 kam in semi-girth (38½ inches) and 6 wah long (39 feet), and would have sold at 50 ticals, *i.e.* by cutting it now a loss of 45 ticals has been incurred. The total loss on 37,000 logs, therefore, is 1,665,000 ticals (100,000*l.*). The number of undersized logs floated down the Salween is larger in proportion than to Bangkok, and may be estimated at, say, 20,000. Making the same calculation as to loss incurred we arrive at another sum of 900,000 ticals (56,250*l.*), which, added to 100,000*l.*, makes up a total loss of 156,250*l.* Siam, therefore, loses every year by the reckless destruction of young timber a sum which may amount in some years to as much as 156,250*l.*, and the actual loss to the revenue at 10 per cent. is over 15,600*l.*

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

9416. Thomas Godfrey, for "Improvements in sliding windows."
 9421. Arthur East, for "An improved clutch for lifting stone."
 9443. Phillip Bright, for "Improvements in water-closets."
 9468. John Jones, for "Improvements in brickmaking machinery."
 9491. John C. Meyers, for "Angle grip for sash-frames."
 9510. James Barker Ledgard, for "Improvements in and connected with flushing apparatus for cisterns, tanks and the like."
 9527. Alfred Julius Boulton, for "Improvements in doors."
 9599. Henry Benjamin and Charles William Anderson, for "An improved guard or covering for the seats of water-closets, &c."
 9812. Francis Joseph James Gibbons, for "Improvements in locks and latches."

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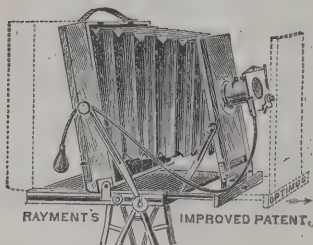
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Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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ABERYSTWITH.—June 15.—For Lecture-room and other Rooms, at the University College of Wales. Mr. T. E. Morgan, Architect, 12 Baker Street, Aberystwith.

ALDERLEY EDGE.—June 8.—For Additions to District Council-room. Mr. T. C. Massey, Surveyor, Alderley Edge, Stockport.

ALNWICK.—June 10.—For Alterations to Infirmary. Mr. W. T. Hindmarsh, Alnwick.

ALVASTON.—June 8.—For Building Board School. Mr. A. Macpherson, Architect, Tenant Street, Derby.

AMERSHAM.—June 15.—For Building Villa. Mr. Guest Luckett, Architect, Granville Street, Aylesbury.

ASPATRIA.—June 11.—For Building Cottage. Mr. J. Turnbull, Brayton.

BALLYMONEY.—June 14.—For Building Lecture Hall adjacent to Church. Mr. A. Todd, Main Street, Ballymoney.

BARKING.—June 7.—For Supply of 300 Yards 1½-inch and 100 Yards 2-inch Broken Guernsey Granite, and 400 Yards Kentish Flints. Mr. C. J. Dawson, Public Offices, East Street, Barking.

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BARNSELY.—June 12.—For Building Two Dwelling-houses. Messrs. Wade & Turner, Architects, 10 Pitt Street, Barnsley.

BARRY.—June 15.—For Shedding, &c., for Agricultural Show. Mr. W. V. Huntley, Secretary, Welsh St. Donat's, near Cowbridge.

BATLEY.—June 11.—For Building Four Houses. Mr. W. Crawshaw, Architect, Market Place, Batley.

BELFAST.—June 10.—For Construction of Steel Principal Roof at Terminus. Mr. R. B. Belfrage, District Engineer, Belfast.

BEXLEY.—June 12.—For Supply of Glazed Stoneware Pipes. Mr. E. Reeve Boulter, Bexley Heath.

BLACKPOOL.—For Building Municipal Offices. Messrs. Woodhouse & Potts, Architects, St. George's Road, Bolton.

BLVTH.—June 10.—For Building Extensive Business Premises. Mr. W. E. L. Thompson, Architect, Blyth.

BOSHAM.—June 7.—For Erection of Board School Offices, Master's House, for School Board, according to Plans by Mr. N. C. H. Nisbett, Winchester. Mr. J. W. Loader Cooper, Clerk to Board, Emsworth.

BRADFORD.—June 12.—For Additions to Methodist Church. Messrs. Rycroft & Firth, Bank Buildings, Manchester Road, Bradford.

BRADFORD.—June 11.—For Building Store, West Bowling. Mr. W. H. Whitehead, 24 Tudor Street, Bradford.

BRIDLINGTON QUAY.—June 11.—For Building Drill Hall. Mr. J. Earnshaw, Architect, Wellington Road, Bridlington.

BRISTOL.—June 15.—For Building Board Schools, Class-rooms, &c., at Oldham, for the Bitton Board. Mr. W. L. Bernard, Architect, 3 St. Stephens Chambers, Baldwin Street, Bristol.

BRUNDALL.—June 10.—For Building Two Semi-detached Residences. Messrs. George Fitt & Co., Architects, 1 Queen Street, Norwich.

BRYNAMMAN.—June 11.—For Building Board School for 300, and Enlarging Panteg School. Mr. C. Martyn, Pontardawe.

BURY.—June 22.—For Works in Erection of Buildings and Boundary-wall at Sewage Disposal Works. Mr. J. Cartwright, Borough Engineer.

CALSHOT CASTLE.—June 11.—For the Erection of Five Dwelling-houses, Detached Watch House and Boat House for Coastguard. Director of Works Department, 21 Craven Street, Strand.

CAMBERWELL.—June 11.—For Construction of an Underground Convenience. Mr. O. S. Brown, Vestry Hall, Camberwell, S.E.

CARLISLE.—June 10.—For Additions to Viaduct Hotel. Messrs. Moffat & Bentley, Architects, Whitehaven.

CHELMSFORD.—June 15.—For New Rooms and Repairs to Grand Stand. Mr. F. Whitmore, Architect, 17 Duke Street, Chelmsford.

CLECKHEATON.—June 10.—For Building Sunday School. Mr. Reuben Castle, Architect, Westgate, Cleckheaton.

CONSETT.—June 11.—For Additions to Commercial Hotel. Mr. Wm. Cooke, 59 Sadler Street, Durham.

CORWEN.—June 13.—For Erection of Buildings in Connection with the Workhouse. Messrs. John Williams & Son, Architects, Dee View, Corwen.

COVENTRY.—June 8.—For Cloakrooms, Lavatories, &c., Holy Trinity Schools. Mr. Herbert W. Chattaway, Architect, Trinity Churchyard, Coventry.

CROSSNESS.—June 13.—For the Purchase and Removal of 7,000 Gallons of Coal Tar. Mr. H. De la Hooke, L.C.C. Offices, Spring Gardens, S.W.

CROYDON.—June 18.—For Furniture, &c., for New Town Hall and Library. Mr. C. M. Elborough, Municipal Offices, 8 Park Street, Croydon.

CWMPARE.—June 14.—For Building Fifteen Houses. Mr. W. D. Morgan, Architect, 36 Queen Street, Torr, Pentre, R.S.O.

CWMTILLERY.—June 17.—For Cloakrooms, Out-offices and Repairs, and Alterations to Board Schools. Mr. George Rosser, Architect, Victoria Buildings, Abercarn.

DENBIGHSHIRE.—July 1.—For Taking-down and Re-building Upper Bedwell Bridge. Mr. R. Lloyd Williams, County Surveyor, Denbigh.

DEWSBURY.—June 14.—For Alterations to Club and Institute. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

DONAGHMORE.—June 10.—For Alterations, &c., to Presbyterian Church. Mr. Hobart, Architect, Dromore, co. Down.

DURHAM.—June 14.—For Building Two Cottages for the Governors of Sherburn Hospital. Mr. H. Henry, Architect, 11 North Bailey, Durham.

EARLSHEATON.—June 10.—Three Heating Chambers for Board Schools. Mr. Joseph Croft, Market Place, Dewsbury.

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FULHAM.—June 25.—For the Erection of a Fire-engine Station. Mr. H. De la Hooke, L.C.C. Offices, Spring Gardens, S.W.

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HARWICH.—June 27.—For Building Board School, &c. Mr. J. W. Start, Architect, Cups Chambers, Colchester.

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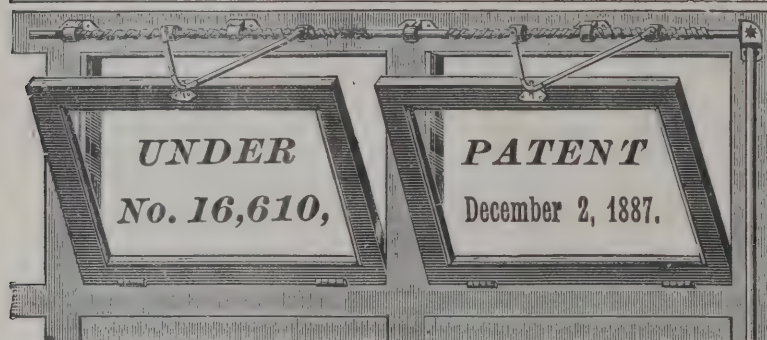
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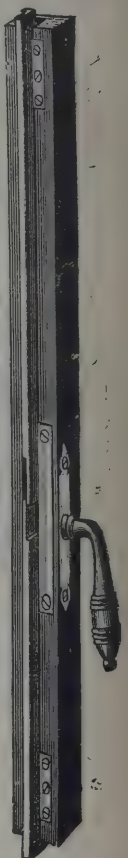
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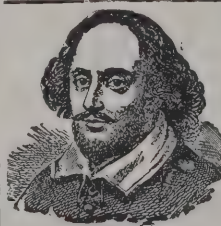
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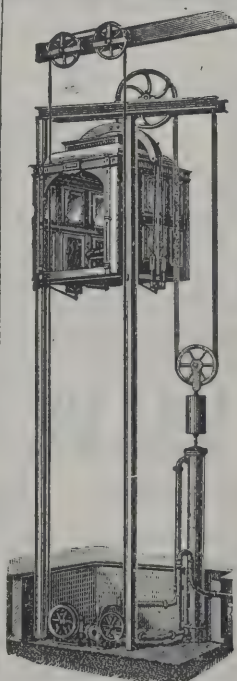
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For Substructure of Borough Theatre, High Street, Stratford.

Mr. F. MATCHAM, Architect.

Atherton & Latta, Poplar	£2,518	0	0
Maddison & Clarkson, Camden Town	2,389	0	0
Watson, Ilford	2,350	0	0
Toms, Camden Town	2,266	0	0
A. Reed & Sons, Stratford	2,225	0	0
Lamble, Kentish Town	2,187	0	0
Holloway Bros., Battersea	2,148	0	0
J. Jackson, Plaistow	2,100	0	0
Chamberlain Bros., Hammersmith	2,097	0	0
T. White & Son, Bow	2,080	0	0
Perry & Co., Bow	2,066	0	0
Walsh & Co., Canning Town	2,015	10	0
Harris & Wardrupp, Limehouse	1,973	0	0
Gregar & Sons, Stratford	1,967	0	0
CARTER, Grays (accepted)	1,919	4	0
Gladding, Whitechapel (withdrawn)	1,748	0	0

MAIDENHEAD.

For Erection of New House, Maidenhead Thicket, Berks,
Mr. ARTHUR VERNON, Architect, 29 Cockspur Street,
London, S.W., and High Wycombe.

Hollis	£1,995	0	0
Barker	1,875	0	0
Gibson	1,750	0	0
Webster	1,750	0	0
Silver	1,674	0	0
LOOSLEY (accepted)	1,517	0	0

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For Narberth County School (Intermediate and Technical).
Mr. JOHN MORGAN THOMAS, Architect, Water Street,
Narberth.

J. Williams, Narberth	£1,585	0	0
G. Cole & Sons, Milford Haven	1,485	0	0
W. Davies, Tenby	1,447	0	0
J. REES & SONS, Narberth (accepted)	1,430	0	0

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Edward Weatherley	£967	10	0
Thomas Curry	967	10	0
John Slater & Son	955	10	0
E. & F. George	925	0	0
N. W. Maughan	920	10	5
G. & C. Wells	865	16	0
Robert Simmons	790	10	0
JOHN JACKSON (accepted)	763	11	2

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Brewers, Newport and Cardiff. Mr. W. L. GRIFFITHS,
Architect, Newport, Mon.

J. Mordecai	£3,115	0	0
Stephens, Bastow & Co., Limited, Bristol	2,965	0	0
T. Evans, Cardiff	2,800	0	0
Jones & Co., Gloucester	2,697	0	0
Hatherley & Carr, Bristol	2,660	0	0
A. E. Parfitt, Newport	2,539	0	0
J. Jenkins, Newport	2,500	0	0
J. Linton, Newport	2,395	0	0
W. A. LINTON, Newport (accepted)	2,329	0	0

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Oswestry.

Bradley & Lloyd, Shifnal	£589	0	0
Evans & Felton, Oswestry	487	10	0
W. H. THOMAS, Oswestry (accepted)	480	0	0

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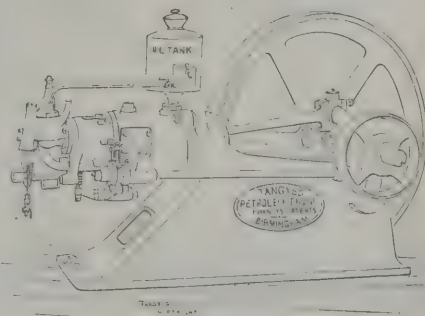
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For Alterations and Additions at the Borough Police Station.			
Mr. JOHN BOWEN, Borough Surveyor.			
T. H. Kingerlee, Oxford	£438	0	0
J. H. Margetts, Reading	419	0	0
T. Pilgrim, Reading	373	0	0
F. Newberry, Reading	360	0	0
W. HAWKINS, Reading (accepted)	324	0	0

STREATHAM HILL.

For Repairs and Decorations at Broadlands, Streatham Hill, for Mr. James Clark. Mr. JOHN JAS. DOWNES, Architect, 11 The Parade, Lewisham High Road, S.E.			
Sayer, New Kent Road	£419	0	0
CANDLER & SON, Brixton Hill (accepted)	369	0	0

SWINDON.

For Building Board School, Clarence Street, Swindon, for the Swindon School Board. Mr. WILLIAM DREW, M.S.A., 22 Victoria Street, Swindon. Quantities by the Architect.			
Benfield & Loxley, Oxford	£10,800	0	0
D. C. Jones & Co, Gloucester	10,747	0	0
J. Long & Sons, Bath	10,743	0	0
J. Leighfield, Swindon	10,537	0	0
H. A. Forse, Bristol	9,998	0	0
H. Flewelling, Wootton Bassett	9,805	0	0
G. H. Wilkins, Bristol	9,774	2	4
T. Barrett, Swindon	9,609	0	0
W. Jones, Gloucester	9,487	0	0
C. H. Hunt, High Wycombe	9,333	0	0
C. WILLIAMS, Swindon *	9,276	14	0

* Accepted subject to the approval of the Education Department.

SWITHLAND.

For Sewerage Works for the Village of Swithland, Pipe Sewers, Manholes, &c., Pumping Station, Laying and Jointing Rising Main, &c., and Laying-out Sewage Field, for the Barrow-upon-Soar Rural District Council. Mr. J. B. EVERARD, Engineer, 6. Millstone Lane, Leicester.			
J. Holme, Leicester	£2,947	5	0
S. Hipwell, Wisbech	2,890	0	0
Moss & Son, Loughborough	2,860	0	0
J. MASON, Leicester (accepted)	2,604	10	10

TENBY.

For Pier and Landing-Stage. Mr. R. ST. GEO. MOORE, Engineer, 17 Victoria Street, Westminster.

Pier and Stage.

G. S. L. Baines, London	£2,140	0	0
T. Gibson, London	2,027	14	9
Winton & Co, Carmarthen	2,018	0	0
Heenan & Froude, Manchester	1,974	9	0
Head & Wrighton, Stockton	1,950	0	0
G. Palmer, Neath	1,894	17	7
T. Butler, Leeds	1,714	11	0
A. Thorne, London	1,670	0	0
W. Davies, Tenby	1,657	0	0
Finch, Chepstow	1,655	0	0
Dixon Bros., Swansea	1,546	2	0
LYSAGHT, Bristol (accepted)	1,460	0	0
G. Lawson, Glasgow	1,454	0	0

For Abutment Additional, at per Yard Cube.

Winton & Co.	1	10	0
T. Butler	1	5	0
T. Gibson	1	2	6
G. Lawson	1	2	0
G. Palmer	0	18	0
A. Thorne	0	17	6
Finch	0	16	6
Lysaght	0	12	0

THIRSK.

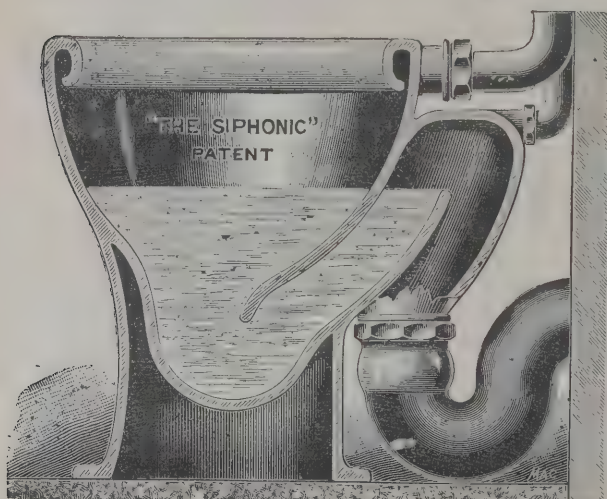
For Building Warehouses, Stables and Alterations to House at Thirsk. Messrs. HAWE & FOLEY, Architects, Beverley. Quantities by the Architects.

H. Greenlaw, Beverley	£660	0	0
C. R. MANFIELD, Thirsk (accepted)	645	0	0
Architects' estimate	695	0	0

WORSBOROUGH.

For Laying-out Additional Sewage Irrigation Works, and Cutting New Course for River at Lewdin, in the Township of Worsborough, for the Urban District Council. Mr. JOHN WHITAKER, Surveyor, Saville House, Worsborough Bridge.

Duncan & Jones, Stairfoot	£1,538	10	0
Porter & Higham, Worsborough	1,205	0	0
G. HALL, Heeley, Sheffield (accepted)	860	0	0



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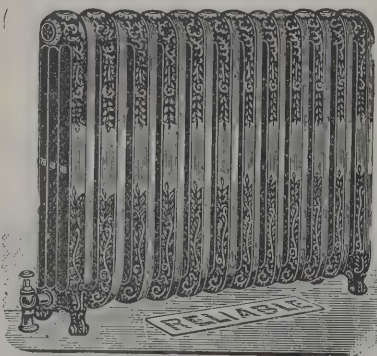
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TRADE NOTES.

THE new schools, Mansfield Woodhouse, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

THE Expanded Metal Company have removed their London offices to 39 Upper Thames Street, E.C.

THREE windows, respectively memorials to the late Mrs. C. H. Barnsley, have been inserted in the Sandon Road Wesleyan Church, Birmingham. The subjects depicted are:—(1) "Dorcas distributing Bread and Garments to the Poor" (inserted in the canopy is an angel holding a crown); (2) "Mary, illustrating Worship, and Martha, Service, with the Lord as Teacher;" (3) Our Lord with Children, and presentations to Him." The whole of the windows also contain portraits of the deceased lady, and in one window also of the children. The work was designed and executed by Messrs. Swaine, Bourne & Son, Birmingham and London, who also executed the large window in the church.

ON Thursday, May 30, a reredos in Caen stone was dedicated in St. Nicholas' Church, Rattlesden, Suffolk, in memory of the late Lieutenant-Colonel Windsor Parkes and his wife, by their surviving children. Colonel Parkes represented the Western Division of Suffolk for twenty-six years in the House of Commons, finally retiring from Parliament in 1880. He was a staunch supporter of the Conservative Government of the day, and was much esteemed by the late Lord Beaconsfield. The reredos that has just been erected to his memory has been executed entirely by Messrs. Jones & Willis, of 43 Great Russell Street, London, and is a beautiful work of art; the centre panel, which is a reproduction in Caen stone of Leonardo da Vinci's picture of the *Last Supper*, is excellently carved, the sculptor having cleverly and faithfully reproduced the expression on the faces and the pose of the figures.

THE *Leeds Mercury* says:—The joiners' strike in Leeds is now at an end. The 350 men who have been standing out for an advance of wages and other advantages were to return to work yesterday, Thursday. The men originally asked for an advance of wages from 8d. to 9d. an hour. The masters expressed their willingness to give them 8½d., but this concession the men refused to accept. They reduced their claim, however, to 8¼d. In regard to the reduction of working hours in winter which the men desired, concessions have been made on both sides.

THE committee of the Aberdeen Town Council have accepted tenders for the construction of a new bathing station at the beach. The contracts amounted to 2,689l.

AT the meeting of the Penrith Rural District Council it was stated that Mr. Brebner, contractor of Edinburgh, wished to decline the contract for the waterworks at Ousby. His tender amounted to 827l. The next lowest, that of Mr. Joseph Jackson, of Penrith, amounted to 927l. It was agreed that the contract should be offered to Mr. Jackson, but that if he declined or wished for an alteration in the terms, the contract should be reopened to competition.

AT the meeting of the Gloucester City Council tenders were received for carrying out the contracts in connection with the Newent extension of the waterworks. The principal one was for cast-iron pipes. That sent in by Messrs. Cochrane & Co. was accepted at 10,373l. It was agreed to apply to the Local Government Board for sanction to borrow a sum of 5,000l. for erecting a sanitary dépôt and stabling, and a sum of 3,000l. for works of street improvement, sewerage and water-supply.

AT the meeting of the Liverpool City Council on Wednesday the resolution of the Council of April 3, 1895, accepting the tender of Messrs. J. Paterson & Son, 60 Soho Street, Liverpool, for the erection and completion of the proposed new Central Fire Station and Police Buildings in Hatton Garden for the sum of 30,770l. was rescinded.

AN outbreak of fire took place at the historic Dee Mills at Chester on Thursday morning, the 30th ult. On the previous day an experimental trial had been made of the performance of a new Merryweather engine just lately received. Messrs. Merryweather's engineer, Mr. Harper, had not left the city; he was roused out of bed, and as soon as he with the new machine appeared on the scene to aid the six jets already playing on the burning pile, the fire brigade speedily got the fire under. The legend or prophecy ran that thrice the Dee

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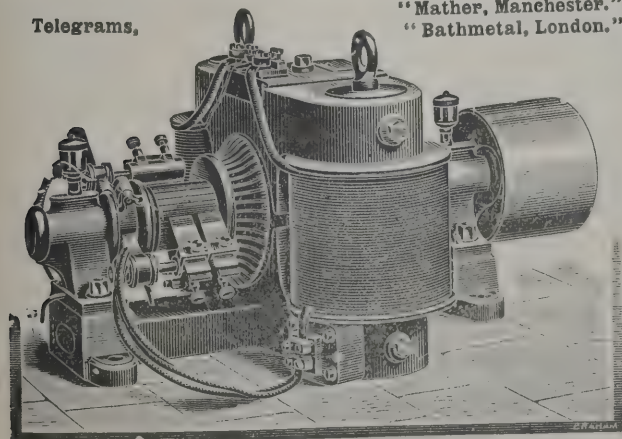
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"MANCHESTER" DYNAMO.

Mills would be burnt, but the originators of the legend did not allude to this, the fourth fire. Luckily the pile was preserved from total destruction.

WE hear that Mr. C. H. Mabey has just executed and fixed a granite fountain in the Paddington Recreation Grounds, and it was understood that it was the intention of the donor, Mr. R. M. Beachcroft, to open the fountain yesterday (Thursday). The fountain bears the following inscription:—"This fountain was erected in 1895 by R. M. Beachcroft, Alderman, L.C.C., to commemorate the acquisition of the first public recreation-ground in London established on self-supporting principles." Mr. Mabey has also executed the models and carving in stone and wood, and also the ornamental fibrous plaster ceilings, for the new Clerkenwell Town Hall, which is to be opened on the 14th inst.

VARIETIES.

A SITE has been selected by the Carlisle Town Council for a fire-engine station. The special committee have decided to employ an independent architect to prepare plans, &c.

PROGRESS is reported by the engineers of the Upper Stour Main Valley Sewage Board, Messrs. E. B. Martin and W. G. Fiddian, on the whole of the contracts. It has been decided to apply for 10,000*l.* from the Public Works Loan Commissioners, this making the second instalment of the 87,433*l.* required to carry out the sewerage scheme.

THE Eccles Town Council will apply for a loan to carry out extensions to the town hall for municipal offices. The plans have been prepared by Mr. A. C. Turley, the borough surveyor.

THE Local Government Board have now given their sanction to an application made by the Macclesfield Corporation to borrow 60,000*l.* for works of sewerage and sewage disposal. The scheme includes an outfall sewer to convey the sewage to a site three miles below the town, and precipitation works and an irrigation area of 59 acres. The object of the scheme is to purify the river Bollin, which is now polluted by manufacturers' refuse. The engineer to the scheme is Mr. W. H. Radford, of Nottingham.

THE Grand Ducal Court Company of Saxe-Coburg and Gotha, comprising 133 persons, have made arrangements with Sir Augustus Harris to give for the first time a course of performances at Drury Lane Theatre. They arrive in London

via the Hook of Holland on June 14, and open on June 17 with Zeller's comic opera "Der Vogelhändler," which will be followed by the comedy "Die Ehre" and other equally interesting plays.

PLANS have been prepared by Mr. H. Quick, architect and surveyor, for the erection of the new mission-room and classrooms of St. Thomas's parish, Coventry. The contract has been given to Messrs. Bolton & Paul, of Norwich.

THE Local Government Board have sanctioned a loan of 12,500*l.* to the Rushden Urban District Council for the construction of sewage disposal works.

ANOTHER of the diamond-borings for water advised by Professor Nordenskiöld has been successful on the coasts of Sweden, it is stated, this one being on the little island of Marstrand, on the west coast of Gothenburg. The boring was undertaken in a rock standing 8 metres above the sea, and was carried to a depth of 39 metres.

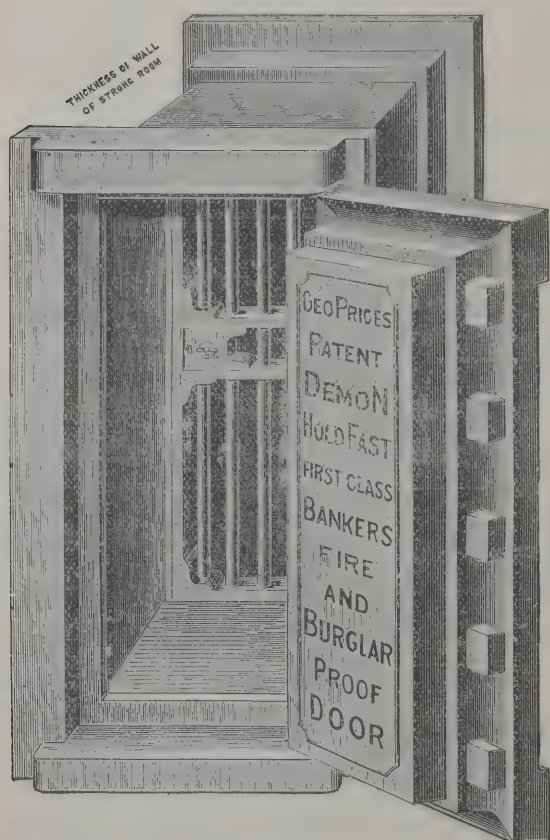
PLANS are being prepared by Messrs. G. & J. Steané, of Coventry, for still further enlarging the extensive buildings of the local provident dispensary.

SIR ROBERT PULLAR, of Perth, is to be presented with a portrait of himself, to commemorate his receiving knighthood.

THE Leeds City Council have appointed Mr. George Fearnley Carter assistant in the Insanitary Areas Engineering Department, at a salary of 200*l.* per annum.

THE Shore Old Mill at Oldham has collapsed from roof to basement. Several passers by had narrow escapes. It is ten years since cotton spinning was carried on in the premises, which have latterly been let in tenements to various tradesmen. The building was six storeys high, and it is supposed the collapse is due to decayed beams. The borough surveyor was at once communicated with, and steps taken for the public safety.

A REPORT has been furnished to the heritors by Mr. James Barbour, architect, Dumfries, on the insanitary condition of Lockerbie parish church. The report embodies two plans for the improvement of the building, to cost 140*l.* and 600*l.* respectively. The latter includes a slight extension of the building and an improvement of the ventilation, and was recommended by Mr. Barbour as essential in order to put the church into a satisfactory condition. The heritors offer a sum of 1,000*l.* for a larger scheme of restoration to the kirk session if desired.



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FOR THE SURREY COUNTY COUNCIL.

TRUMPINGTON ROAD BOARD SCHOOL.

BUILDING AND BUILDERS.

AT Ayr Messrs. Bennett & Sons have purchased an old block of buildings fronting Wellington Square and Fullarton Street. The purchasers intend to erect on it business buildings, four storeys high, at a cost of 15,000/. Miss Jane Houldsworth, Roselle, has also had plans prepared of a block of buildings in Newton, specially for working people, which are to cost several thousands.

THE 13th inst. has been fixed by Sheriff Cowan for hearing the petition of the Paisley Police Commissioners in regard of an alteration of the building by-laws, so that it shall be allowable for mutual gables to be 9 inches from the chimney or flue and 4½ inches on each side, instead of 9 inches on each side of the flue as at present, thereby reducing the gables from 2 feet 3 inches to 18 inches. In the case of outside gables, it is asked that there be 6 inches of stone on the outside, 9 inches from the chimney or flue, and 9 inches of brick or stone on the inside, thereby reducing the gable from 2 feet 3 inches to 2 feet.

THE Kirkintilloch Dean of Guild Court have passed plans for rebuilding the premises at the Old Foundry, occupied by Messrs. McNeill & Co., as a felt manufactory, which were recently burned down.

AT Edinburgh the Lord Provost's committee of the Town Council have recommended that plans should be prepared by the City Superintendent of Works for the reconstruction of North Bridge Street, so that the erection of the two tenements at the north end may be proceeded with in conformity with a general design.

AT the holding of the Edinburgh Dean of Guild Court twelve warrants were granted, and included was one for building a church for the trustees of the Kirk Memorial E. U. Church.

THE death is announced of Mr. J. H. Routledge, builder, of Mealsgate, Carlisle, after suffering a few days from severe cold. Mr. Routledge was, the *Carlisle Journal* says, one of the best known men in the district. The Uldale Grammar School, recently opened, was built by him.

AT Leeds a new building is about to be erected in Park Row, for the National Provincial Bank of England, from the designs of Messrs. Perkin & Bulmer, architects.

THE Glasgow Police Commissioners have approved of erection at Govanhill of accommodation for the police, fire, and lighting departments at an estimated cost of 18,000/. At the meeting it was stated that the contractors have three years to build the new Glasgow bridge, though it is expected it will be finished before that time.

THE Glossop Town Council have decided to apply for borrowing powers for 44,000/. instead of 40,000/. to carry out the proposed sewage scheme.

THE Leeds City Council have authorised the erection of a caretaker's house at Wortley Recreation Ground at a cost not exceeding 300/.

ELECTRICAL.

THE North Staffordshire Tramway's Company have intimated to the local authorities in the potteries proposals to carry out a great expansion of their system, and to use electric force for the propulsion of the tramway cars.

THE factory of Messrs. J. & J. Cash, Kingfields, Coventry, is to be enlarged by the addition of a warehouse and shed. Electrical power will be introduced to drive the machinery. Mr. C. G. Hill's tender of 5,300/. for the building has been accepted.

THE new lighthouse at Penmarch Point, Brittany, the thirteenth of those lighted by electricity on the French coasts, will be, it is stated, about 130 yards to the eastward of the present one. Its tower, which will be about 185 feet above high-water line, is being built entirely of the best description of granite, and the light will be of such intensity as will, it is said, enable it to be seen at a distance of nearly 100 miles in clear, and from 25 to 28 miles in hazy weather, having an illuminating power of 10,000,000 candles. It is hoped that the new light will come into operation at the commencement of 1897.

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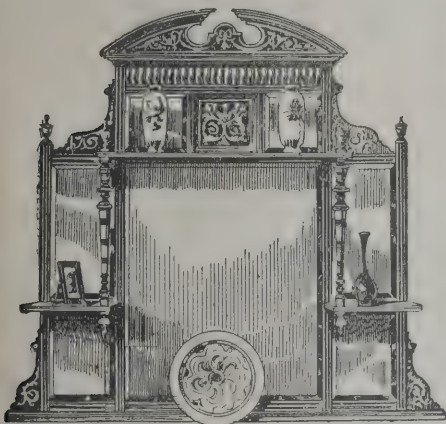
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THE SANITATION OF WORTHING.

A PAPER on the "Sanitary History of Worthing" was read at the Conference of Sanitary Inspectors on the 1st inst. by Mr. C. T. Gardner (chief sanitary inspector). Describing the condition of the place in 1845, when the population was about 4,000, the area 584 acres, and the number of houses 1,200, he alluded to a unique arrangement of drainage then in use on the first floors of houses in Warwick Buildings, now Warwick Road, in the shape of wooden hoppers, emptying into a wooden trunk which discharged on the foreshore. Yet, although in other respects also the sanitary arrangements were most primitive, Worthing neither in 1847 nor 1849 yielded a victim to cholera. In 1853, however, a local board was established, and in 1857, under the superintendence first of Mr. Ranger, and afterwards of Sir Robert Rawlinson, extensive systems for drainage and water supply were carried out at a cost of over 30,000*l*. The sewage was then conveyed to the Teville stream, discharging at the eastern extremity of the foreshore into the sea, but for some years afterwards a great portion of it was pumped upon land belonging to a local company, the Worthing Land Improvement Company. Owing to the rapid growth of the town, however, in 1876 the outfall was found to be inadequate, and the Local Board decided to construct a new outfall sewer which should discharge its contents into the sea at low water. In the same year new machinery was added at the waterworks, costing, with the outfall, a further 14,000*l*. In 1881 improved regulations were made with regard to the water supply, and in 1884 further extension took place. In 1890 the charter of incorporation was obtained, and in the following year the census returns showed a population of 16,666, an area of 1,425 acres, and houses numbering 3,189. In May 1893, an unfortunate outbreak of disease occurred, and the Council decided to remodel and reconstruct the whole of the system of drainage and water supply. The sewage works were estimated to cost 40,000*l*, and the waterworks 35,000*l*, the Council having also decided to acquire the West Worthing waterworks at a cost of 26,500*l*. In 1893 also the sanitary committee gave instructions for a house-to-house inspection of the borough, which had been proceeded with as speedily as circumstances would admit, the result being that upwards of 30,000*l* had been expended by the various owners and occupiers within the borough to conform with the wishes of the committee. It was apparent that the town was fast approaching its former prosperity. This was mainly due to the well-directed efforts of those who had worked together—the Council, the officials and

the burgesses—for the common good, and with all natural advantages, unrivalled climate, fine sands, lovely walks and drives, and pure air, Worthing was, and must remain, one of the healthiest watering-places on the English coast.

THE INSTITUTION OF CIVIL ENGINEERS.

FOR some of the original communications read and discussed at ordinary meetings of this Institution during the past session the Council have made the following awards, viz.:—George Stephenson medals and Telford premiums to A. J. Durston, Engineer-in-Chief, R.N., for his paper on "The Machinery of Warships," and to J. I. Thornycroft and S. W. Barnaby for their joint paper on "Torpedo-boat Destroyers"; Telford medals and premiums to W. D. Bruce for his description of the "Kidderpur Docks, Calcutta," and to S. J. Berg for "The St. Gothard Mountain Railway and the Stanzerhorn Cable Railway"; the Manby premium to C. Butters and E. Smart for their joint paper, "Plant for the Extraction of Gold by the Cyanide Process"; and a Crampton prize to J. Richardson for "The Mechanical and Electrical Regulation of Steam Engines." For papers printed in the proceedings without being discussed—a Telford medal and a Telford premium to A. Sharp for "Circular Wheel-teeth"; a Telford medal to the representatives of the late Henry Gill for his paper on "The Filtration of Muggel Lake Water Supply"; Watt medals and Crampton prizes to J. A. Griffiths for "Windmills for Raising Water," and to A. J. Hill, for "Repairs and Renewals of Railway Rolling Stock"; and Telford premiums to O. Guttman for his account of "The Removal of the 'Iron Gates' of the River Danube"; to K. Leibbrand for his paper on "A Concrete Bridge at Munderkingen"; to A. Scott for "Deep-water Quays at Newcastle-on-Tyne"; and to D. Cunningham for "The Estuary of the Tay." For papers read at supplemental meetings of students Miller prizes were awarded to W. G. Wales for "Caissons and Gates for Closing Lock and Dock Entrances"; to S. H. Barraclough for his paper, contributed jointly with L. S. Marks, entitled "Some Experiments on the Heat-Losses to the Cylinder Walls of a Steam Engine"; and to E. E. Matheson for "Timbering in the Amptill Second Tunnel"; whilst for papers read before local associations of students Miller prizes were bestowed on A. M. Stewart (of Glasgow) for "The Glasgow District Subway"; on R. C. Farrell (of Glasgow) for "The Permanent Way and Signalling of the Glasgow Central Railway"; and on H. Fowler (of Manchester) for "The Testing and Inspection of Plates."

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THE SANTOS DOCKS.

WHAT are termed the Santos Docks, the *Dundee Advertiser* says, are a solid construction of quay wall, with a frontage of 800 mètres, which carries a double line of rails in connection with the São Paulo Railway Company's traffic, extensive iron warehouses for goods, built at intervals along the extension, and hydraulic cranes (Armstrong system) movable on rails and capable of lifting one and a half tons each from the vessels discharging, is what is termed the Santos Docks. The first section, which extends from the Custom House to the old railway pier, is now open to traffic, and the construction of the section from the Custom House to Paqueta is being pushed forward energetically. An important item in the work is the dredging of the quay berths, and it has been calculated that to obtain a regular depth of 25 feet 12,007,000 cubic mètres of mud have to be dredged; to obtain 25 feet 3 inches, 18,063,700 cubic mètres; and to obtain 29 feet 6 inches, 24,146,000 cubic mètres. In order to arrive at this conclusion 1,000,000 to 1,500,000 cubic mètres must be dredged annually for this important work, and a new steam dredger will shortly arrive capable of dredging 200 cubic mètres per hour, at a depth of 12 mètres, and fitted with electric light for night work. The total extension of the quays when completed will amount to 4427.33 mètres, and then, after the old vessels that are abandoned and sunk in the river are removed, Santos will become the most important seaport in South America, and the commercial emporium not only of the state of São Paulo and of the vast territories of Minasserales, Goyaz and Parana (which are already connected), but also the states of Santa Catharina, Rio Grandedotul and Matto Grosso, which will also be connected in a few years by the railways now in course of construction. The inauguration of the half of the first section was effected on February 1, 1892, and thrown open to traffic.

BRIGHTON TOWN HALL.

PLANS have been prepared by the borough engineer and surveyor providing needed additional accommodation in the Town Hall, without encroaching on the market. The cost will be about 30,000*l.* The additional accommodation provided by the scheme now proposed will be sufficient for the requirements

of the Corporation for many years to come. The committee recommend that the plans be approved, and that they be authorised to advertise for tenders for carrying them out, and that the money be borrowed under the Brighton Improvement Act, 1884, for a period of thirty years. The main proposals are as follows:—

1. To reduce the incline of the road on the east side of the Town Hall, which now has a steep fall towards the east, to nearly a dead level, thus allowing the present basement of the building on that side to be treated practically as a ground floor suitable for offices. 2. To add a new wing to the Town Hall on the east side, extending over the ground now covered by the great flight of steps, thus giving an additional floor area of about 6,500 square feet. 3. To extend the recessed external walls of the Town Hall above the first floor on the east, west and north sides of the building to the line of the external walls of the ground floor, thus providing an additional floor area of about 3,000 square feet. 4. To gut the whole of the interior of the building and to rearrange it, with the additions, so as to provide the best accommodation possible for each department.

The main architectural style and features of the existing building will be retained in all the alteration, and will be reproduced in all the additions. Stock brickwork faced with cement will be used for all the external walls except where it may be necessary to substitute Portland stone as used in the existing building. The principal alterations in the appearance of the elevations will be those to the windows, which will be enlarged to provide both better light and air. The existing entrances on the north and west sides will be retained as the principal entrances for the public. The north entrance will give access to the upper floors by means of the central staircase, while the west entrance will open into the central hall, from whence access to the upper floors will be provided by means of a hydraulic passenger lift. The present entrance to the Police Offices will be abandoned. There will be no public entrances to the Town Hall on the east side of the building, but the entrance to the Police Department will be on the south side of the new annexe, and the entrance to the sanitary offices on the north side of the new annexe. There will be no entrances on the south side of the Town Hall.

The new police court and offices will be formed in the new annexe on the east side of the Town Hall; the space now occupied by the police and magisterial department will in future be allocated to the use of the municipal offices; the vacant space under the floors of the assembly room and council



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chamber will be utilised; the eastern side of what is now a useless basement will be adapted for use as offices; the existing prison cells will be retained.

DWELLINGS OF THE POOR IN PROVINCIAL TOWNS.

AT the annual conference of the Sanitary Inspectors' Association at Worthing on the 1st inst., a paper by Alderman Cortis, chairman of the local sanitary committee, on "The Dwellings of the Poor," was read. The author said that his object in writing the paper was not to raise the class known as the dregs of society, but rather to exterminate them, for, as a "class," he urged that the dregs of society ought not to exist. Neither did he suggest the invocation of Parliament to improve the law except to a very slight extent; his appeal was to those who had the administration of it. Before they asked for further legislation they must fearlessly and honestly administer the laws they already possessed. The first evil caused by neglect in this matter was the increased mortality of the nation, but this was not the greatest evil. In fact, were the increase confined to the districts causing it he should hesitate to call it an evil at all from a worldly point of view. Not that he underestimated the value of a human life, but from the point of view of political economy the loss of the lives of the *habitués* of the slums was a positive gain to the commonwealth, because—and this was the second evil—while they lived they waged a perpetual war against society, which to defend itself was driven to make laws curtailing the liberties of law-abiding citizens. They entailed also an immense loss on the nation by forcing them to increase the police, magistrates, judges and juries, and eventually they had to be housed in their reformatories, gaols and workhouses. Thirdly, they were schools of vice, entailing moral degradation on the pupils, to be disseminated through the length and breadth of the land, and another evil to which they were subjected through the existence of these congested districts was the importation of the pauper alien. This state of things continued because capital invested in the rotten homes of the poor yielded the highest interest; they were the dearest homes in the land, and simply because sanitary authorities closed their eyes and ears, while the owners took their 10 to 20 per cent. profit. Hence people with limited capital were tempted to invest in slums, screwing out of them the greatest profit they could, and keeping them at the lowest level of dilapidation. Sometimes it happened that when an attempt was made to improve them the

owners were found to be almost as poor as the occupiers. The authorities, under the circumstances, hesitated to enforce the law, which, if carried out, would involve the ruin of the owner, and in that way the evil was perpetuated. The proper plan was to insist on good sanitary conditions, so that the small capitalist would cease to find these poor properties the most profitable investments. The question next arose, "What is to be done with the ejected of the slums when their homes are demolished?" In Worthing, by acting tentatively and in seasonable times, they had managed so far without any such provision.

Since the passing of the "Housing of the Working Classes Act, 1890," out of forty-eight houses reported unfit for human habitation, twenty had been put in order and made habitable, twenty-eight closed and fourteen eventually demolished. Still, in his opinion, some provision should be made for the ejected. His suggestion was that in every town municipal cottages should be erected and tenanted from time to time by ejected families. In moderate-sized towns these cottages should be within the town area, so that tenants might be within easy distance of their work, but in large cities with congested areas, such as London and Liverpool, where overcrowding both of houses and inmates existed, they should be erected outside the city, and the tenants conveyed to and from their work by tram or train at a nominal charge, say one penny per journey, jointly at the imperial and local expense. This was the only legislation he asked for. With this exception the Housing of the Working Classes Act of 1890 was comprehensive enough for what they wanted, the great need being, as he said before, administration—thorough, systematic sanitary inspection, in fearless and honest administration of the law. The author concluded his paper by reminding the members of the Association that the health of the community was in a great measure in their hands, and that many of the comforts of life depended on the efficient and honourable discharge of their duties. He even believed in their power by fulfilling them to save more lives and to do more materially for humanity than all the doctors and physicians that were their contemporaries in the district in which they lived and worked, or prevention was not, as they were taught, better than cure. His desire had been to call attention to an evil that affected all classes of society, to awaken the public to a sense of their responsibility with regard to the conditions of life of their poorest brethren, and to impress upon them the national importance of dealing promptly and effectively with this great question—the amelioration of the home life of the poor.

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WIND PRESSURE ON BRIDGES.

AMONG rules issued by the Public Works Department, India, the following one has been issued as to wind pressure on girder bridges:—

The amount of wind pressure on a railway bridge is to be calculated on the assumption that the maximum normal pressure may be $1\frac{1}{2}$ tons per 100 square feet of surface exposed. The surface exposed to be reckoned as follows:—

A train surface calculated on a height of 13 feet 6 inches on the 5-feet 6-inch gauge, or 11 feet on the metre gauge, multiplied by the total length of the girder.

The actual surface of that portion of one girder which may be below rail level, or at a height above rail level of more than 13 feet 6 inches on the 5-feet 6-inch gauge, or 11 feet on the metre gauge. Also, in the case of triangulated girders, the actual vertical surface of that portion of the leeward girder which may be below rail level, or at a height above rail level of more than 13 feet 6 inches on the 5-feet 6-inch gauge, or 11 feet on the metre gauge.

The total wind pressure thus calculated is to be provided for by a proper system of wind bracing, or floorplating, and its effect taken into account as forming a part of stress on the chords of the main girders. Proper arrangements must also be made at the girder ends to secure sufficient stiffness to resist racking action where diagonal stiffeners are not used.

Wind pressure is to be treated as "fixed load," and its effect on the different members of the structure is to be allowed for as provided in the rule for "maximum permissible stress."

BISHOPSGATE IMPROVEMENTS.

A MEMORIAL to the City Commissioners of Sewers has been prepared with reference to the proposed improvement in Bishopsgate Street Within, near the church of St. Helen. The memorialists state that, being ratepayers, owners and occupiers of houses and offices in the parish of St. Helen, they invite the attention of the court to the urgent necessity of improving and widening the entrance to Great St. Helen's from the main thoroughfare of Bishopsgate Street Within. "The present entrance," they say, "is formed by a very narrow roadway without footpath of any kind, and under a low arch between Nos. 35 and 36 Bishopsgate Street. The narrowness of the

roadway and the absence of any foot pavement have for a long time caused the greatest inconvenience, as well as considerable risk of injury, to foot passengers, as there is a large traffic of wine merchants' vans and carts constantly passing in and out of Great St. Helen's. It is a matter of daily occurrence to see the entrance blocked by a waggon or van endeavouring to make its way into or out of this narrow road, and foot passengers are in consequence positively shut out of Great St. Helen's for the time being, and have to make their way round through the entrance into Crosby Square, which is almost equally inconvenient and dangerous. The present old wooden building, No. 36 Bishopsgate Street, is about to be pulled down and a modern building erected on its site. We would, therefore, submit that this is an opportune time for effecting a much-needed improvement, which would not only remove a source of difficulty and danger to foot and carriage passengers, but would also afford an adequate approach to the beautiful and historic church of St. Helen, which has recently been admirably restored and is justly considered as one of the finest and most interesting churches in the City."

THE GROWTH OF WOLVERHAMPTON.

WOLVERHAMPTON has been so long associated with the appellation of "the Metropolis of the Black Country," that in the minds of many people, says the *Birmingham Post*, the idea may have occurred that, owing to the severe depression for years past in the iron and hardware trades which has visited this part of the United Kingdom, the borough may have received a severe check to its material progress. Such, however, has not been the case, and although the population has not increased at so rapid a rate as in the neighbouring town of Walsall, there has been a very marked advance, and a native of the town, after an absence of a dozen years or so, would be surprised at the beneficial changes which have taken place in the centre of the town, and more especially at the numerous groups of dwellings of all kinds which have appeared on the outskirts of the municipal district, where of late years land has been cut up for building sites and streets of houses have sprung up in so surprisingly expeditious a manner as to leave little doubt that there is sufficient vitality in the commerce of the immediate neighbourhood to provide additional work year by year for a steadily-growing population.

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It is also a gratifying feature as indicating the faith that exists in the stability of the staple industrial concerns of the town that in almost every case where extensive building operations have been embarked upon they have been undertaken, not by outside people, but by well-known local business men, who, after a lengthened experience, have been able to weigh up the probabilities of wisely investing their money in house property, and they appear by the continued rearing up of small houses to be thoroughly satisfied that Wolverhampton, instead of being a decaying town, has a far more gratifying commercial career before it than some people are willing to give it credit for. In one or two cases the estates of well-known old Wolverhampton families have been bought up for building purposes, and in one instance the picturesque domain where a present-day budding statesman was wont to romp in childhood's hours has now passed into the hands of the speculative land agent and builder. Notably have great alterations taken place in the district which it is hoped will shortly be formed into the new ecclesiastical parish of St. Chad, where, starting from Hillside, Lea Road has been made a trunk thoroughfare from which a number of streets, sufficient in themselves to make a good-sized village, run in the direction of Goldthorn Hill in one direction, and in the other towards Merridale Road. Between Steelhouse Lane and Dudley Road the land has also been opened up in a vigorous manner, and a considerable area of green fields of not long ago is now covered with tenements. In the vicinity of the meadow, on the Dudley Road, where the Wolverhampton Wanderers' football team first achieved fame, pleasant villas and homes for the working classes are crowding upon one another, and the inhabitants are multiplying rapidly; while in other parts of the town where the speculator in land and the architect have been most industrious may be mentioned Springfields and the localities intersected by Newhampton Road, Staveley Road and Tettenhall Road. Altogether, taking the comparatively short period of the last nine years, over eight miles of new streets have been dedicated, and at an early date many more of these arteries will be in the hands of the Corporation, while during the same period there have been over three thousand houses erected.

In addition, many buildings of first importance have taken the place of old property or filled up gaps in the main thoroughfares and elsewhere, and have enriched the architectural appearance of the borough. Although the adoption of the artisans' dwellings scheme has proved, from a monetary point of view, a costly experiment, and is even now causing

much heartburning at those unwelcome periods when the rates have to be paid, it must be admitted that it was a municipal leap forward, and has added greatly to the beautifying and importance of the town. Since that time, notwithstanding adverse trade influences, the borough has probably developed at a greater speed than ever before; and if through competition and other causes some old industries are less prosperous than of yore, others have been introduced into the town, and instead of Wolverhampton being a decaying town, there is every reason to believe that it will go on advancing, and not many years hence may occupy a more prominent position among the leading cities of the kingdom. By the improvements effected under the Artisans' Dwellings Scheme the heart of the town has been metamorphosed; the narrow and inconvenient streets which met with such favour among the ancient dwellers in the borough, and the obnoxious slums in their rear, having given place to wide thoroughfares, which are being ornamented with public and business premises, facially as skilfully and artistically designed as the most modern buildings in the leading cities.

Chief among the erections which have added to the appearance of this part of the borough are, in Lichfield Street, the Art Gallery—the gift of the late Mr. Philip Horsman—and its sister institution the Municipal School of Art; the welcome extension, from an architectural point of view, of the old Wolverhampton and Staffordshire Bank; the Victoria, North-Western and Criterion Hotels, the Sir Tatton Syke's block, the Grand Theatre, and in the immediate vicinity the new union offices, the Drill Hall, the School Board offices, the co-operative buildings, and the Vine Inn. The Eye Infirmary has lent an additional charm to the Compton Road; and of other large structures which have been put up of late may be mentioned the Higher Grade and Walsall Street Board schools, the All Saints' Church schools, the Queen Victoria Nursing Institution, and in the same thoroughfare, Bath Road, the Catholic Apostolic Church; the Wesleyan Chapels in New Hampton Road and Ranelagh Road; the Church Institute in St. Peter's Square; while the gas offices now cover the site of a circus in Darlington Street; and of the Corporation buildings may be noted the borough hospital, the weights and measures offices, and the electric-lighting station. Despite the gratifying strides which have been made in the development of the town there is yet plenty of room for additional erections, inasmuch as the area of the municipal boundary extends to 3,440 acres, and a large tract of open space is still available for building opera-

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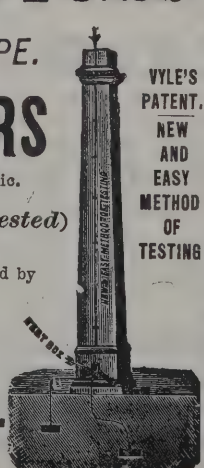
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tions. During the last ten years the Corporation have effected desirable street improvements in Chapel Ash, at the corner of Ball Road, in Dunstall Lane, Riches Street, Goldthorn Hill, Great Brick-kiln Street, Dudley Road, Piper's Row, and in laying out the ground fronting St. Peter's Church in Lichfield Street.

Of the larger works which have been carried out by the municipal body for the benefit of the community, the laying-out of the magnificent public park on the tract of land formerly used as a racecourse has been one of the most welcome, and it has given so much gratification to the inhabitants that another people's park at the east end of the town is being provided to meet the wishes of the toiling masses in that part of the borough. This open space will be of the same dimensions as the west-end park—50 acres—and for the gift of the land the thanks of all are due to the generosity of the late Duke of Cleveland and the sitting member for Wolverhampton West, Sir A. Hickman. For some time past workmen have been engaged in levelling and preparing the ground, and it is expected that this welcome addition to the recreation grounds of the masses will be opened during the present year. The population of the borough has grown from 75,738 in 1881 to the estimated total of 86,000 at the present time. Taking into consideration the fact that the population of two adjacent towns between 1881 and 1891 declined owing to the depression in the iron trade, Wolverhampton must have suffered in a similar manner but for the enterprise of many leading business men, who have developed old industries and introduced new ones which have provided employment for many hundreds of additional hands. During the past decade Mr. R. E. W. Berrington, the borough engineer, who is now terminating his connection with the Corporation, has been so actively identified with the municipal history of the town that his share of the work accomplished is sure to linger for a considerable time in the recollection of the inhabitants, as the numerous public improvements he has successfully carried through, added to the model sewerage works which he designed, and the miles of new streets he has made, will all leave marks of his ability and perseverance. Never before has the town shown a better ten years' progress with regard to everything that pertains to public health and general sanitation. There may be much still to be desired, but Wolverhampton can boast of as complete a system of sewerage and drainage and well laid-out outfall works as can be found in connection with any borough in the kingdom. In completing these works the greatest possible difficulties

have had to be overcome owing to the unique position in which the town is situated with regard to the galvanising industry and the trouble which has been caused by the "pickle" being sent down the drains from the various establishments. But for this one cause the rates of the town would have been materially relieved, but, owing to the injury caused to neighbouring estates through the waste acid escaping into the brook adjoining the Barnhurst Sewage Farm, the borough may be said to have been in the law courts for about fifteen years. By a considerable outlay of money in putting down precipitation works at the Barnhurst and a separate system of drainage to carry off the surface-water—works which have been ably carried out by Mr. Berrington—the legal troubles have almost been got rid of, and the inhabitants are now no longer in fear and trembling lest the Corporation mace should be seized as the outcome of the litigation which arose over the sewage question. During Mr. Berrington's tenure of office he has done much to improve the sanitary condition of the dwellings of the working classes, and has expended a large sum in demonstrating the reliability of the waste-water closet system as an efficient sanitary appliance, and which is likely at no distant date to supersede the present objectionable pan system, which has been not only extremely costly, but owing to various defects in the method of carrying it out has created such a great amount of opposition to it in the town as to cause municipal candidates to make it one of the principal planks in their programmes. It is needless to enumerate the whole of the works which have been carried out by Mr. Berrington during the last few years, but we may say that the town will have no cause to complain if the work of the engineering department during the next ten years is carried on with as much ability as it has been during the retiring engineer's term of office.

So far we have dealt with the growth of the town during the past fifteen years, but it may not be uninteresting in a few words to refer to some of the leading improvements which have been effected since the incorporation of the borough in 1848, when Mr. G. B. Thorneycroft was chosen as the first mayor. Only a short time previously, when Mr. C. P. Villiers was elected as member for the borough, the population was about 25,000, the Whitmore Reans district, now so populous, was a farm, Waterloo Road had not been made and Heath Town was in reality a "heath." There were then only three churches, and the site of the Agricultural Hall and a large part of the eastern division of the town was garden ground. Since the

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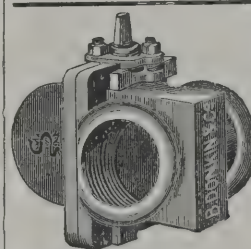
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advent of the Corporation they have kept pace with the progress of sanitary science, and the result has been that the conditions of life in the town have become far more favourable to health and longevity than was formerly the case. The Wolverhampton baths, erected by a joint-stock company in 1850, have been acquired by the municipal authority and greatly improved. The Market Hall, which cost 30,000*l.*, was opened in 1853, and has not only been a boon to the town, but it yields a valuable revenue which goes to relieve the rates of the town. A cattle market, covering an area of 4½ acres and providing accommodation for nearly eight thousand animals, was also provided by the local parliament, and not far away in Garrick Street, what was once the police-station has been changed to a Municipal Free Library, with its lecture room and class rooms, and where an educational process is going on that cannot be overvalued. The Town Hall, erected under the eye of Alderman Walker at a cost of 19,000*l.*, exclusive of the site, was opened in 1871, and in Queen Street the Government have provided a county court and a post office; but in the course of another year it is expected that the business of the latter institution will be removed to the new building now in course of erection in Lichfield Street. To private speculation the town is indebted for the Exchange, built in 1851 at a cost of 15,000*l.*; the Agricultural Hall, which was opened at a cost of 6,000*l.* in 1863; and the cemetery, which has had a sanitary effect on the town, in preventing further interment in the overcrowded churchyards of populous neighbourhoods. The cemetery was formed under an Act obtained in 1847 by the proprietors, and cost about 10,000*l.* Another institution which gains in respect as it grows older is the Wolverhampton and Staffordshire Hospital, on the Cleveland Road, which was erected by subscriptions, and cost about 15,000*l.* The Wolverhampton Orphan Asylum, on Goldthorn Hill, is also one of the noblest institutions of its kind in the country. Its original cost was more than 30,000*l.*, but many improvements have since been effected, and there will shortly be opened in connection with it a new chapel. Few institutions are doing better work for boys and girls deprived of their nearest relatives, but donations to the charity are greatly needed in order to extend its operations. Other references might be made to the progress which has been made by the borough during the past fifty years, but we have said enough to show that Wolverhampton during that period has grown to what it is now from small dimensions, and that it is up to date and is likely to keep pace with the times.

COMMERCIAL VALUE OF PEAT.

AN industry that is likely to prove the means of greatly enriching that poverty-stricken country is about to be introduced into Ireland shortly by a body of financiers. After many years of experiments, conducted for the most part in Holland, where an experimental factory has been in operation with marked success, a process of utilising peat and making it valuable for various commercial purposes has been discovered. In the past peat has been used merely as fuel, in which form its commercial value has been at the very most only a few shillings a ton; and as moss litter, in which form it has earned large dividends for the shareholders. By the present process, however, it assumes great importance, and cannot fail to effect a revolution in more than one branch of trade. Peat, as is well known, consists of two varieties—red peat, which is that which lies uppermost, and black peat, that is found immediately underneath the red. The red is fibrous in nature, and by the process to which we refer that fibre is combed out until it resembles wool, and then woven into either cloth, which is half the cost of and far more durable than shoddy; or matting and rugs, it being possible to sell the latter at a good profit from a shilling retail. The remarkably good face the cloth possesses is shown by the fact that last week, at the Irish Industries Exhibition, held at the residence of Earl Fitzwilliam, 4 Grosvenor Square, the Duchess of York was so pleased with it that she bought sufficient for a dress, while the Duke ordered a shooting suit of it to be made for him. Not only is the fibre of commercial value when refined by combing, but the waste product, bleached by the patent process, is utilised as peat pulp, and possesses all the properties of wood pulp, at the same time being very much cheaper. Lastly, the dust produced in the course of the refining is possessed of valuable disinfecting qualities, and can be sold to advantage. The black peat, like the red, can also by the process be rendered a source of large revenue. It is reduced to a powder, and then by compression formed into solid blocks that are a perfect counterfeit of ebony, and can be used for all the purposes for which that wood is available. Further, unlike ebony, it is very hard and not brittle, and thus can be worked up in the form of pistol handles, panels, pulleys, &c., and, as it is a non-conductor, electric appliances. Up to the present the patents have been worked only experimentally at the factory in Holland, whither the peat has been exported; but now that perfection has been arrived at, and a financial success insured,



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the patentees intend erecting a factory in Ireland and commencing the manufacture of the products on a commercial basis. A company, we hear, is now being formed for the purpose of introducing the system to the English public. Meanwhile, any information can be obtained on application to Mr. H. W. Christmas, 42A Bloomsbury Square, who is acting as the solicitor to the company.

BUILDING IN EASTBOURNE.

THERE is some uncertainty in Eastbourne about the taking over of some new roads on building estates by the Town Council as public highways. The highways and drainage committee, after visiting the following roads on the Compton Place building estate—Tower Place and Latimer Roads, roads on Redoubt Estate, Ashford Square, Paradise Drive, Link Road, Carlisle Road (upper part), the Duke's Drive, Denveon and Gaudeck Roads, Warley Road, Milnthorpe, Dalton and Chesterfield Roads, Buxton Road, Staveley Road, Mount Road, South Cliff, St. John's Road, Fairfield and Silverdale Roads—decided that they were prepared to recommend the Council to adopt them as highways providing certain works were carried out. The committee also instructed the town clerk to inform the agents of the Compton Place and Gilbert building estates that in consequence of the expenses caused by leaving green spaces on the outsides of the pavements the Council would refuse to take over such roads in future, and suggest that they be paved and small spaces left around the trees. The committee received a request from the agent to the Compton Place building estate to reconsider their decision as to not adopting roads as public highways when the borders of the pavements were turfed off. The committee resolved to decide each case upon its merits after receiving a report from the borough surveyor. A letter was read from Mr. H. Michell Whitley accepting the conditions imposed by the Council as to the completion of the roads on the Gilbert estate before adoption. Mr. Whitley urged that the Corporation should pass the plans for new roads at Upwick submitted a long time ago, he being willing to abide by the arrangement made in 1893, and that the estates should construct a surface-water sewer 12 inches in diameter from the Bourne stream of the Star Brewery to Upwick, although the borough surveyor then stated that it was not required. The committee requested the borough surveyor

to consult with Mr. Henry Law, C.E., as to what was necessary to be done in regard to surface-water and sewerage, and prepare a scheme for the consideration of the committee.

NEW YORK ARCHITECTURE.

IN the *World*, of New York, Mr. Barr Ferree writes:—The city of New York is the one great city of the world which is entirely deficient in buildings of real architectural interest, grandeur, magnificence and taste. Of costly buildings we have no end; of big ones no limit; in pretentiousness we are unequalled; in costliness of structures erected by private enterprise we are unrivalled; but none of these things, separately or together, make architecture or help to endow our great city with that splendour and taste which by her position, her culture and her wealth she is entitled to.

An architectural chaos reigns in New York as it reigns in no other city upon earth. Nowhere are there so many bad buildings, nowhere is there so wanton a disregard of the simplest requirements of art and of good taste. Wealthy corporations, men of culture and of wealth, people who are familiar with every resource of our civilisation, who have read largely, travelled widely, studied the world's masterpieces of art in every form, come to the metropolis of America and befoul its streets with structures that are absurd when they are not ugly, that are preposterous when they are not frightful, and that violate all the canons of good taste.

Once it was necessary to go to Philadelphia to study examples of the utterly horrible in architecture; once Chicago was the laughing stock of the world for the idiosyncrasies of its buildings; but New York has long since outstripped these towns in the nightmares in brick and stone and iron that have been built within it.

One has but to look—the street and the location matters not—to see examples of the very worst architecture in the world. On every side these buildings flaunt their horrors in the eyes of a defenceless public, clamouring for attention and bellowing for notice, so complete and astonishing is the mixture of their parts.

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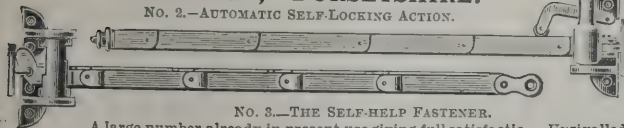
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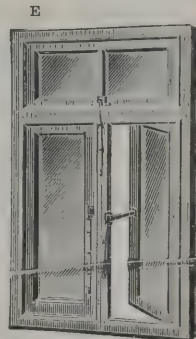


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building in being put together with less regard to relationship in the individual specimens? What is a New York dwelling but a slender slice, whose variety is often the cause of its failure? What is any great structure in New York but a horrifying example of what ought not to be and yet which is and cannot be got rid of?

No corporation in New York is housed in a structure that is artistic and beautiful, sober, orderly and scholarly in meeting the requirements of modern commercial life. No man of great wealth is here housed in a residence such as his means would justly entitle him to have and which might well be a rich and beautiful adornment to our city. Our public buildings are too scandalously ridiculous to be thought of as architecture in any sense.

This architectural chaos, this turmoil of building, this accumulation of architectural monstrosities and absurdities is the direct result of the crudeness of the public taste. In a community where art is measured by cost, where beauty is estimated by the rareness of the materials, where proportion is not understood, where architectural fitness and propriety are unknown, the buildings cannot be other than dreadful, the architecture anything but distressing.

A building is not a fine piece of architecture because it is big and high and has cost a million or two. These things have nothing to do with art. But in New York and elsewhere in America it is popularly supposed that if a building has cost a million it must be fine. True, it should; but a hundred examples in our city prove the contrary.

The architects are as blameable as anybody. These delightful gentlemen, who should know what good architecture is and how to make it, who assume that responsibility and stand before the world as the creators of our buildings, have often as little an idea of the work they are trying to do as the newest draughtsman in their offices. The best of them will, if he gets the chance, do the most dreadful thing the human brain can conceive of in architecture. And he expects to be praised for it.

The client, possibly with boundless resources at his command, will time and again assent to the most dreadful designs, because he knows nothing of architecture and its application to the necessities of our civilisation. Then the critics, coming out of their shells, tell their friend the architect he has done a masterly thing, which, perhaps he has, in badness. And the poor populace is dazed at what it sees and hears, and no wonder.

Are we improving? Is our architecture better than it was a quarter of a century ago? Is it bettering every day?

The architecture of New York is more varied than it was twenty-five years ago; it is bigger, richer in materials, more costly, more pretentious, more self-assertive. The architects have larger opportunities of doing large things, and when they make mistakes and design badly, and do the things they ought not to do, their sins are magnified a thousandfold.

Architecture runs close to fashion, and our windows and doors, our cornices and roofs, vary in height, in width, in shape, in positions very much as women's fashions change, without reason. If cornices are worn low this year we may look for them higher next season. And that is about all the progress we are making in architecture as it is watched from year to year.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

9960. Kurt Schebzel, for "A new or improved roofing tile."
 9971. Thomas Boon, for "Improved solid brick-making machine."
 10024. John Julia Ridway, for "Improvements in locks and latches."
 10061. John Schrack Shrawder, for "Improvements in pneumatic door-closers and checks."
 10110. Charles Marson, for "Slabs for covering ceilings and partitions."
 10138. Edwin James Preston, for "Improvements in waste-preventer flushing cisterns."
 10217. James Fenton and James Thornley, for "Improvements in draught-excluders for doors, windows and the like."
 10260. James Conlong, for "Improvements in door-latches."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & Co., Patent Agents, 37 Chancery Lane, London, W.C.

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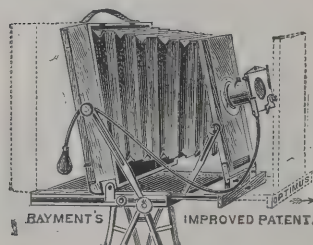
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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

CONTRACTS OPEN.

ABERDEEN.—June 15.—For Widening Bridge of Girnock. Mr. John Milne, Surveyor, Aboyne.

ABERYSTWITH.—June 15.—For Lecture-room and other Rooms, at the University College of Wales. Mr. T. E. Morgan, Architect, 12 Baker Street, Aberystwith.

ALNWICK.—June 17.—For Building Business Premises. Mr. M. Temple Wilson, Architect, 69 Narrowgate, Alnwick.

AMERSHAM.—June 15.—For Building Villa. Mr. Guest Luckett, Architect, Granville Street, Aylesbury.

BALLYMONEY.—June 14.—For Building Lecture Hall adjacent to Church. Mr. A. Todd, Main Street, Ballymoney.

BARGOED.—July 1.—For Additions to Board School. Messrs. James & Morgan, Architects, Charles Street Chambers, Cardiff.

BARRY.—June 15.—For Shedding, &c., for Agricultural Show. Mr. W. V. Huntley, Secretary, Welsh St. Donat's, near Cowbridge.

BILSTON.—June 18.—For Providing, Laying and Jointing a 14-inch Cast-iron Rising Main 6,600 Yards Long, and 450 Yards of 12-inch Main. Mr. Baldwin Latham, M.I.C.E., 13 Victoria Street, S.W.

BIRKENHEAD.—June 27.—For Engine and Boiler-house and Other Buildings, &c. Mr. J. N. Shoolbred, Engineer, 47 Victoria Street, S.W.

BRADFORD.—June 22.—For Building Dye-house, Ware-house, Boiler-house, Chimney, &c. Mr. S. Spencer, Architect, 344 Great Horton Road, Great Horton.

BRECON.—June 26.—For Rebuilding Hepste Bridge and Repairing Tringarth Bridge. Mr. H. Edgar Thomas, County Hall, Brecon.

BRISTOL.—June 15.—For Building Board Schools, Class-rooms, &c., at Oldnam, for the Biton Board. Mr. W. L. Bernard, Architect, 3 St. Stephens Chambers, Baldwin Street, Bristol.

BURNLEY.—June 20.—For Building Church. Mr. Thomas Bell, Architect, 14 Grimshaw Street, Burnley.

BURY.—June 22.—For Works in Erection of Buildings and Boundary-wall at Sewage Disposal Works. Mr. J. Cartwright, Borough Engineer.

CARDIFF.—For Rebuilding Chapel. Messrs. Jones, Richards & Budgeon, Architects, Cardiff.

CARLISLE.—June 19.—For Additions to Board School. Mr. G. D. Oliver, Architect, Lowther Street, Carlisle.

CHELMSFORD.—June 15.—For New Rooms and Repairs to Grand Stand. Mr. F. Whitmore, Architect, 17 Duke Street, Chelmsford.

CHEPSTOW.—June 22.—For Building Boys' School. Mr. J. W. Stanton, Clerk to the School Board, Chepstow.

COPTHORNE.—June 22.—For Building Stables and Additions to House. Mr. William Buck, Architect, 60 West Street, Horsham.

COSELEY.—June 19.—For Enlarging District Council Chamber and Offices. Mr. C. W. Shackleton, District Surveyor, 2 Green Street, Coseley.

CROYDON.—June 18.—For Furniture, &c., for New Town Hall and Library. Mr. C. M. Elborough, Municipal Offices, 8 Park Street, Croydon.



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CWMPARE.—June 14.—For Building Fifteen Houses. Mr. W. D. Morgan, Architect, 36 Queen Street, Torr, Pentre, R.S.O.

CWMILLERY.—June 17.—For Cloakrooms, Out-offices and Repairs, and Alterations to Board Schools. Mr. George Rosser, Architect, Victoria Buildings, Abercarn.

DENBIGHSHIRE.—July 1.—For Taking-down and Re-building Upper Bedwell Bridge. Mr. R. Lloyd Williams, County Surveyor, Denbigh.

DEWSBURY.—June 14.—For Alterations to Club and Institute. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

DEWSBURY.—June 20.—For Additions to Workhouse Infirmary. Mr. Walter Hanstock, Architect, Batley.

DURHAM.—June 14.—For Building Two Cottages for the Governors of Sherburn Hospital. Mr. H. Henry, Architect, 11 North Bailey, Durham.

EAST HAM.—June 24.—For Erection of School Buildings to Accommodate 2,020 Children. Mr. Robert S. Curtis, 120 London Wall, E.C.

EDINBURGH.—June 22.—For Boundary Wall for Royal Observatory. Mr. George Mosham, George Street, Edinburgh.

FULHAM.—June 19.—For Making-up and Paving Draycott Mews, Rectory Road and Stokenchurch Street. Mr. Charles Botterell, Town Hall, Walham Green.

FULHAM.—June 25.—For the Erection of a Fire-engine Station. Mr. H. De la Hooke, L.C.C. Offices, Spring Gardens, S.W.

GLASGOW.—July 18.—For Superstructure of Art Galleries. Messrs. Douglas, Hunter & Whitson, 197 St. Vincent Street, Glasgow.

GUISELEY.—June 16.—For Enlargement of House. Messrs. Walker & Collinson, Architects, 227 Swan Arcade, Bradford.

HARWICH.—June 27.—For Building Board School, &c. Mr. J. W. Start, Architect, Cups Chambers, Colchester.

HATFIELD.—June 25.—For Petty Sessions Court and Other Buildings. Mr. Urban A. Smith, County Surveyor, 41 Parliament Street, S.W.

KILBURN.—June 18.—For Enlargement of Postmen's Sorting Office. Mr. Hardcastle, 5 Old Queen Street, S.W.

KNIGHTSBRIDGE.—June 19.—For Paving with Hard Wood Ennismore Gardens Mews North. Mr. G. R. Wheeler, Town Hall, Caxton Street, S.W.

LEICESTER.—June 27.—For Underground Conveniences. Mr. E. G. Mawbey, Borough Surveyor.

LEITH.—June 24.—For Alterations to Post Office. H.M. Office of Works, Edinburgh.

LLANDILO.—June 29.—For Building School. Mr. David Jenkins, Architect, Llandilo.

LEWISHAM.—June 18.—For Construction of about 7,320 Feet 4 Feet by 2 Feet 8 Inch Egg-shaped Brick and Concrete Sewer. Mr. Edward Wright, Board of Works Offices, Catford, S.E.

LEIGH.—June 17.—For the Construction of a Well and Bore Hole. Mr. Jas. Mansergh, 5 Victoria Street, S.W.

LEWISHAM.—June 18.—For Supply of Broken Guernsey Granite, Port Philip Stone, Dug and Picked Flints and Croydon Gravel. Mr. Edward Wright, Board of Works Offices, Catford.

LIMEHOUSE.—June 24.—For Relaying the Carriageways of various Streets and Supplying new Guernsey and Aberdeen Granite. Mr. Sidney G. Ratcliff, District Board Offices, White Horse Street, E.

LLANDUDNO.—June 17.—For Construction of a Cast-iron 27-inch Diameter Sewer Sea Outfall, Cast-iron Penstocks and other Works and Alterations. Mr. E. Paley Stephenson, A.M.I.C.E., Llandudno.

LONDON.—June 17.—For Repairing and Painting Asylum Buildings in Cleveland Street. Mr. William S. Cross, F.R.I.B.A., 18 Outer Temple, Strand.

LONGTON.—June 15.—For Alterations to Eighteen Shops. Mr. J. W. Wardle, Borough Surveyor, Court House, Longton, Staffs.

MAYFORD.—June 18.—For Erection of Recreation and Gymnasium Hall. Mr. H. De la Hooke, L.C.C. Offices, Spring Gardens.

NEWCASTLE-ON-TYNE.—June 19.—For Stabling for Twelve Horses and Additions to Offices, Dean Street. Mr. Wm. Bell, Architect, Central Station, Newcastle-on-Tyne.

NEW HUNSTANTON.—June 14.—For Building Isolation Hospital. Mr. J. C. Walker, Surveyor, New Hunstanton.

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OMAGH.—June 20.—For Additions, &c., to Lunatic Asylum. The Secretary, Board of Control, Custom House, Dublin.

OTTERY ST. MARY.—June 24.—For Building Church Institute. Mr. E. G. Warren, Architect, Commercial Chambers, Exeter.

PENRHIWEEIBER.—June 15.—Additions to Chapel. Mr. A. O. Evans, Architect, Pontypridd.

PETERBOROUGH.—July 2.—For Building Parish Schools. Mr. H. M. Townsend, Architect, Cross Street, Peterborough.

PLYMOUTH.—June 25.—For Building Working Classes' Houses. Messrs. Hine & Odgers, Architects, Lockyer Street, Plymouth.

PORTISHEAD.—June 17.—For Construction at Portishead of about Eight Miles of Sewers, varying in size from 8 Inches to 15 Inches, with all necessary Manholes, Flush Tanks, &c.; also Cast-iron Sea Outfall, Engine House, Gas Engine, Air Compressors, Ejectors, Cast-iron Air and Sewage Mains, Ventilating Shafts, &c.; Supply and Delivery at Portishead of 134 Tons of 15-inch Cast-iron Pipes; Fifty Ornamental Cast-iron Ventilating Columns; about 100 Ventilators for Fixing at the Top of Ventilating Columns and Shafts. Mr. T. J. Moss-Flower, C.E., Carlton Chambers, Baldwin Street, Bristol.

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RICHMOND.—June 15.—For Erection of Justices' Court-house and other Buildings. Mr. W. J. Ancell, Architect, 3 Staple Inn, London.

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ROCHESTER.—June 20.—For Building Gas Offices, &c. Mr. J. M. Veevers, Secretary, 95 High Street, Rochester.

ROWLEY REGIS.—June 17.—For Construction of Sewers, &c. Mr. E. B. Marten, Engineer, Church Street Chambers, Stourbridge.

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STAFFORD.—June 18.—For Providing, Laying and Jointing a 14-inch Cast-iron Rising Main of about 6,600 Yards Long, and about 450 Yards of 12-inch Main, to be Laid in the Parishes of Wombourne, Penn and Sedgley. Mr. Baldwin Latham, M.I.C.E., 13 Victoria Street, S.W.

ST. HELENS.—June 17.—For Building Central Co-operative Premises. Mr. F. S. Biram, Architect, Windle Chambers, Hardshaw Street, St. Helens.

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WALKER.—June 20.—For Additions and Other Works, at Mechanics' Institute. Messrs. Liddle & Brown, Architects, 20 Collingwood Street, Newcastle-on-Tyne.

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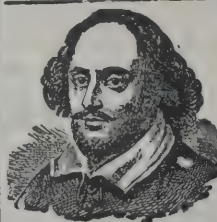
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WAR DEPARTMENT.—June 22.—For Painting Internally and Externally Certain Buildings at Victoria Hospital, Netley. Lieutenant-Colonel R. G. Georges, Royal Engineer Office, Gosport.

WEST HAM.—June 25.—For Erection of Block of School Buildings. Messrs. T. J. Newman & Jaques, 2 Fen Court, E.C.

WOODHALL SPA.—June 21.—For Cottage at Sewage Farm. Mr. Herbert Walker, Nottingham.

WREXHAM.—July 1.—For Taking-down and Rebuilding Upper Bedwell Bridge. Mr. R. Lloyd Williams, County Surveyor, Denbigh.

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Wilson & Son	£4,013	2	3
R. Leake & Sons	3,150	0	0
Latham & Ball	2,962	13	6
J. R. Haines	2,742	1	9
J. R. Haines *	1,479	10	0
LATHAM & BALL (accepted) *	1,445	0	0

* Retendered for Nine Houses.

Plumbing, Painting and Glazing.

R. Leake & Sons	450	0	0
A. Lucas	342	10	0
G. E. Stead	330	4	7
J. Richardson	317	19	6
J. Snowden & Sons	287	10	0
D. Greaves	283	16	8
S. Atkinson, Wakefield *	280	18	0

* Accepted for Nine Houses at Schedule, £173.

AGBRIGG—continued.

Carpentry and Joinery.

R. Leake & Sons	£1,650	0	0
W. J. Atkinson	1,479	0	0
W. Smith	1,454	11	0
W. E. Brook	1,449	16	0
J. Kearsley	1,387	14	0
J. & J. Mountain	1,379	0	0
Bramald & Broadhead	1,290	0	0
A. Elstub	1,280	6	0
J. E. Greenwood	1,215	0	0
F. H. Curry	1,176	9	4
J. Ashton	1,135	3	6
G. Ashton	1,121	0	0
N. Ibbottson, Belle Vue *	1,118	4	6

* Accepted for Nine Houses at Schedule, 652l. 9s. 9d.

ALNWICK.

For Building Three Labourers' Cottages at Coldharbour, Northumberland, for Sir Edward Grey, Bart., M.P. Mr. G. REAVELL, Jun., Architect, Alnwick.
J. & G. GREEN, Warkworth (accepted) . £642 10 2

BOGNOR.

For Erecting a Residence at Bognor, Sussex, for Mr. Ward. Messrs. KIDNER & BERRY, Architects, 23 Old Broad Street, E.C.

W. Burrell, Arundel	£2,269	0	0
S. J. Scott, London	2,173	0	0
W. Wallis, Littlehampton	1,949	0	0
S. STRAT, Bognor (amended tender) (accepted)	1,725	0	0
S. Start, Bognor	1,668	3	0

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For Supply and Erection of Arc Lamps, Switches, &c, for the Town Council.

Siemens Bros. & Co, Limited, Westminster	£2,988	0	0
Crompton & Co., Limited, Mansion House Buildings	2,838	0	0
J. A. Edmundson, Leeds	2,757	0	0
SHARP & KENT, Westminster (accepted)	2,167	0	0

Tenders from Johnson & Phillips and the Electrical Engineering Co. informal.

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CLIFTON.

For Construction of Earthenware Pipe Sewer at Clifton, Bridge-house, for the Halifax Rural District Council. Mr. JOSEPH WILLIAM DYSON, Surveyor.			
J. Whittaker, Huddersfield	£296	11	0
H. Tyson, Halifax	290	2	0
W. Waring, Huddersfield	266	0	0
Garforth Bros., Mirfield	248	16	3
J. Brook, Lindley Moor	248	10	0
J. Taylor, Huddersfield	242	10	6
R. Naylor & Sons, Cleckheaton	236	17	3
B. Brook, Huddersfield	222	14	6
H. Barraclough, Brighouse	219	15	7
Jowett, Brighouse	219	5	4
J. Balmforth, Elland	215	0	0
J. Bateman, Wyke	207	6	8
J. E. Kaye, Crossland Moor	206	13	0
J. WELLS, Hipperholme (accepted)	196	8	9

CORNHILLS.

For Erection of Farmhouse at Cornhills, Kirkwhelpington, for Mr. Thomas Thornton. Mr. GFORGE REAVELL, Jun., Architect, Alnwick.			
MARTINSON & WELTON, Bellingham (accepted)	£1,059	0	0

DYKE.

For Building Four Cottages at Dyke, near Bourne, for Mr. W. H. Sowards. Mr. F. G. SHILCOCK, Architect, Bourne.			
Holter & Glenn, Billingborough	£889	7	2
H. Chappell, Bourne	733	0	0
Wright & Wall, Bourne	713	19	6
A. T. Blood, Bourne	708	3	10
GELSTHORPE & SONS, Bourne (accepted)	650	0	0
J. W. Perkins, Spalding	637	0	0
T. Hinson, Bourne	510	0	0

FRITTON.

For Additions to Church Schools, for the Managers. Messrs. BOTTLE & OLLEY, Architects, Great Yarmouth. Quantities by Architects.			
J. F. W. Bray, Yarmouth	£248	0	0
H. Lacey, Norwich	245	0	0
R. Davy, Great Yarmouth	245	0	0
F. Grimbale, Great Yarmouth	232	0	0
G. W. Beech, Great Yarmouth	209	0	0
COCKRELL BROS., Gorleston (accepted)	200	10	6

FOLKESTONE.

For Building School of Science and Art, &c., on Site adjoining Public Library, Grace Hill, for the Town Council. Mr. FRANK NEWMAN, Architect, 4 Bouverie Square, Folkestone.			
Wallis & Sons, Maidstone	£7,725	0	0
J. Q. Petts & Son, Folkestone	7,715	0	0
H. Stiff, Dover	7,585	0	0
G. H. Denne & Son, Deal	7,520	0	0
T. L. Fearon, Folkestone	7,500	0	0
Hayward & Paramor, Folkestone	7,270	0	0
G. Lewis & Sons, Dover	7,250	0	0
W. H. Hoad, Folkestone	7,235	0	0
H. M. MOODY, Folkestone (accepted)	6,524	0	0

GREENWICH.

For Paving Works, &c., for the Greenwich Board of Works. Ommanney Road.			
G. J. Clark, jun.	£1,506	0	0
Fry Bros.	1,227	0	0
A. T. Catley	1,195	0	0
Roberson & Grant	1,175	0	0
J. MOWLEM & Co., Westminster (accepted)	993	0	0
Arbuthnot Road			
G. J. Clark, jun.	£1,246	0	0
Roberson & Grant	1,034	0	0
Fry Bros.	953	0	0
J. MOWLEM & Co. (accepted)	880	0	0

GLOUCESTER.

For the Newent Extensions of the Gloucester Corporation Waterworks. Mr. W. Fox, Engineer, 5 Victoria Street, Westminster.			
Contract No. 2.—Cast iron Pipes.			
Exors. of C. Jordan, Newport	£13,717	3	0
J. Oakes & Co., London	12,549	13	9
Macfarlane, Strang & Co., Glasgow	12,316	9	11
D. Y. Stewart & Co., Glasgow	12,041	12	6
Maclaren & Co., Glasgow	11,894	17	7
T. Spittle & Co., Newport	11,715	10	5
Staveley Coal and Iron Co.	11,481	0	0
J. & S. Roberts, West Bromwich	11,467	8	9
C. E. & H. M. Peel, Swansea	11,294	3	10
Stanton Iron Co., Nottingham	11,010	5	0
COCHRANE & Co., Dudley (accepted)	10,373	12	6
Engineer's estimate	11,702	10	0

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GLOUCESTER—continued.*Contract No. 3.—Valves, &c.*

W. J. Newth, Gloucester	£505	5	6
C. & A. Walker, Bonnington, Shropshire	462	14	9
Guest & Chrimes, Rotherham	387	5	3
Whitley Partners, Leeds	354	9	9
Hunt & Mitton, North Birmingham	350	10	0
J. Simpson & Co., Pimlico	344	18	6
J. Stone & Co., Deptford	344	11	5
Hamilton, Woods & Co., Salford	343	17	6
Beck & Co., Southwark	326	7	9
GLENFIELD COMPANY, LIMITED, Kilmarnock			
(accepted)	318	12	6
Blakeborough & Sons, Brighouse	316	18	3
Clay, Henriques & Co., Dewsbury (informal)	289	4	0
Engineer's estimate	317	15	0

Contract No. 4.—Reservoir and Pipe-laying.

J. H. Firbank	15,280	6	0
A. King, Gloucester	13,967	0	0
G. Lawson, Glasgow	9,696	0	0
G. Law, Kidderminster	9,185	0	0
W. C. Shaddock, Plymouth	9,120	0	0
L. P. Nott	8,700	0	0
W. Jones, Neath	8,023	0	6
S. Ambrose, Bath	7,975	18	11
G. Bell, London	7,149	0	0
Jones & Fitzmaurice, Birmingham	6,889	0	0
D. C. Brebner, Edinburgh	6,258	0	0
CRUWYS & HOBROUGH, Gloucester (accepted)	6,176	1	0
T. J. Davis, Newport	5,770	17	10
J. A. Ewart, Warrington (withdrawn)	5,709	19	7
Engineer's estimate	7,588	14	4
Rose & Thompson, Rotherham (incomplete).			

GUILDSFIELD.

For Additions to Trelydan Hall, Guildsfield, near Welshpool.			
Mr. W. H. SPAULL, Architect, The Poplars, Oswestry.			
A. Watkin, Welshpool	751	9	0
T. Chaloner, Hanwood	638	0	0
BRADNEY & LLOYD, Shifnal (accepted)	543	0	0

GREAT YARMOUTH.

For Building Residence. Quantities by Architects, Messrs.			
BOTTLE & OLLEY.			
G. E. Hawes, Norwich	£1,859	0	0
J. F. W. Bray, Great Yarmouth	1,768	0	0
Carter & Wright, Great Yarmouth	1,713	0	0
J. Ward, Great Yarmouth	1,690	0	0
T. Howes, Great Yarmouth	1,689	0	0
H. Lacey, Norwich	1,677	0	0
J. Balls, Great Yarmouth	1,661	0	0
G. W. Beech, Great Yarmouth	1,635	0	0
G. T. Flaxman, Great Yarmouth	1,605	0	0
F. Grimble, Great Yarmouth	1,588	0	0
G. BECKETT, Great Yarmouth (accepted)	1,494	15	0

HUDDERSFIELD.

For Alterations at the Workhouse Hospital at Crosland Moor.			
B. Graham & Sons, mason	£833	0	0
B. Hirst & Son, joiner	241	10	0
Mills & Garside, plumber and glazier	149	0	0
J. Cook & Co., concreter	81	12	6
Pickles Bros, slater	71	10	0
R. Heaton, plasterer	56	0	0
R. Heaton, painter	38	5	0

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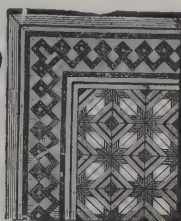
For Widening Bridge over River Bogie, at Huntly. Mr. J. BARRON, Engineer, 166 Union Street, Aberdeen.			
T. Gibson	£1,427	0	0
J. B. Hollom & Co.	1,245	7	0
E. Gauld	897	13	6
D. Porter	864	9	9
W. McKinnon & Co.	841	7	10
J. Abernethy & Co.	826	7	10
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SOMERVAIL & CO., Dalmuir (accepted)	712	6	11

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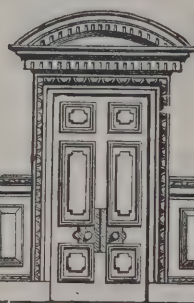
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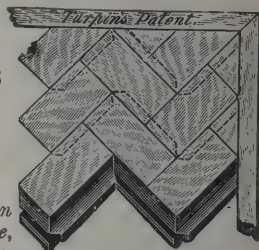
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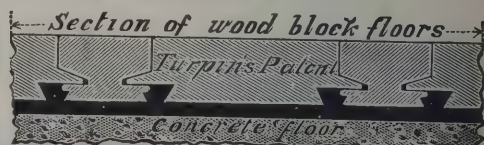
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G. & C. Haswell, Morpeth, joiner . . . 170 0 0
Daglish & Son, Morpeth, plumber . . . 85 0 0
T. W. Athey, Morpeth, slater . . . 54 7 0
R. Fairbairn, Morpeth, plasterer . . . 45 5 0
R. Jackson, Morpeth, painter . . . 21 0 0

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T. Berry & Son, Rochdale	411	0	0
Ashworth & Wolfenden (<i>amended</i>)	406	0	0
J & J. Coates, Rochdale	400	0	0
T. MARSHALL, Rochdale (<i>accepted</i>)	339	0	0

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Cochrane & Sons, Victoria Street	£22,850	0	0
Playfair & Toole, Southampton	22,770	0	0
J. T. Wetham, Weymouth	21,170	0	0
J. Dickson, St. Albans	20,839	0	0
COOKE & CO, Battersea (<i>accepted</i>)	20,000	0	0
G. Shellabear, Plymouth	19,990	0	0
Engineer's estimate	21,329	0	0

PORTAN.

For New Residence at Portan (near Batterstown Railway Station), co. Meath, for Mr. Nicholas Delaney. Messrs. A. SCOTT & SON, Architects, Drogheda and Navan.			
J. Pigott, Navan	£1,250	0	0
P. O'Brien, Kells	1,085	0	0
P. HANWAY, Dublin (<i>accepted</i>)	1,065	0	0
N. Delaney, Athlumney, Navan	1,000	0	0

ROCHFORD BRIDGE.

For Convent Hall and Schools. Messrs. A. SCOTT & SON, Architects, Navan.			
J. Lynam, Knockville	£1,295	0	0
T. REILLY, Killucan (<i>accepted</i>)	1,235	0	0

SHENGHENITH.

For Building a Vestry for the Calvinistic Methodists at Shenghenith, Aber Valley.			
M. William, Coedpenmaen	£569	0	0
J. Lewis, Treharris	460	0	0
J. P. WILLIAMS, Shenghenith (<i>accepted</i>)	445	7	6

SOUTHAMPTON.

For Improvement Works in Brookvale Road, for the Corporation. Mr. W. B. G. BENNETT, Borough Surveyor.			
C. Daysh, Southampton	£639	0	0
F. Osman, Southampton	495	0	0
Crook & Batten, Southampton (<i>recommended</i> for acceptance)	429	0	0

TODMORDEN.

For Building Board School, Wadsworth, Todmorden. Mr. JESSE HORSFALL, F.R.I.B.A., Architect, Todmorden. Quantities by the Architect.			
Emanuel Riley, Hebden Bridge, mason and bricklayer.			
Greenwood & Blackburn, Hebden Bridge, carpenter and joiner.			
Thos. Wrigley & Sons, Hebden Bridge, slater and plasterer.			
S. Taylor, Hebden Bridge, plumber and glazier.			
J. Butterworth, Rochdale, heating engineer.			
J. Horsfall, Hebden Bridge, painter.			
Total, 1,958 <i>l.</i> 10 <i>s.</i>			

WILLOUGHBY.

For Building Master's House and Alterations to Board School, Willoughby. Mr. G. H. BARROWCLIFF, A.M.I.C.E., Architect, Loughborough. Quantities by the Architect.			
A. G. Bell, Nottingham	£849	0	0
Watson & Lovett, Loughborough	827	4	0
T. Barker & Son, Loughborough	825	0	0
W. F. Harding, Loughborough	811	7	0
W. Moss & Son, Loughborough	810	0	0
J. Bailey, Willoughby	759	5	0
A. & S. Main, Loughborough	755	10	0
A. FAULKS, Loughborough*	740	0	0
* Accepted subject to sanction of Education Department.			

At a meeting of the executive committee of the Association for the Promotion of Art and Music in the City of Glasgow a report from the architects was submitted, showing that the basement floor of the New Art Galleries at present in course of erection in Kelvingrove Park will be finished in about a month, and that the work done up to the present time has been thoroughly well executed. It was decided by the committee to advertise for tenders for the superstructure and completion of the building.

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TRADE NOTES.

AN elaborate altar front in carved oak has been presented to the parish church of Glossop, and was used for the first time on Trinity Sunday. The design comprises a series of carved open work tracery panels divided by buttresses and pinnacles arranged so that the frontals for the various seasons can be slid into a groove behind the embroidery filling up the panels. At each end of the front are exquisitely carved figures of SS. Chad and Aidan, bearing shields with the arms of Lichfield and Durham respectively. The frontals of white and red silk with elaborately embroidered floral devices form part of the scheme, and were supplied at the same time. The whole of the work was entrusted to Messrs. Jones & Willis, of 79 Edmund Street, Birmingham.

THE Chell Workhouse Hospital, Tunstall, now in course of erection, is being warmed and ventilated throughout by means of Shorland's patent Manchester stoves, some with ascending and some with descending smoke flues, and also by means of Shorland's patent Manchester grates, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

TENDERS for erection of police-stations at Culter, Ellon, Strathdon and Inch have been accepted by a sub-committee of the standing joint committee of Aberdeen County Council. The four new stations will cost about 3,000l.

AT the meeting of the Walsall Town Council, a recommendation of the streets committee was approved advising the acceptance of three tenders, viz. one of the Asphalte Limestone Concrete Company, Limited, to provide and fix about 12,000 superficial yards of limestone asphalte in various streets and roads, at 1s. 4d per superficial yard; one of Mr. James Atkins, to provide the labour and haulage required for the laying of 7,000 superficial yards of blue bricks for the sum of 8d. per superficial yard; and one of Mr. J. Hamblet, of West Bromwich, for the supply of the blue bricks required during the ensuing year at 2l. 14s. per 1,000. The health committee reported, among other matters, that a house-to-house inspection had been made of 1,919 houses in certain streets which were specified.

AT the quarterly meeting in Kendal of the Westmorland County Council, the county surveyor, Mr. Bintley, reported that the cost of repairs to and maintenance of the main roads, bridges and approaches thereto for 1894-95 had been 11,917l. The cost of cutting and clearing away snow during the severe winter had been a heavy item in several parts of the county.

THE Darlington Town Council have decided that tenders should be invited for the erection of the Technical College.

AT Ayr it has been decided to construct two additional filters at Knockjarder, at an estimated cost of 1,600l. It is stated that at present there is a great waste of water, and rate-payers are recommended to be careful. The rainfall during the month of May was 0.73 inches.

FOR the building of the church of Holy Innocents, Selhurst Road, South Norwood, to be opened on the 19th inst. (Messrs. Bodley & Garner, architects, and the builders Messrs G. F. Smith & Sons, Milverton, Leamington), St. Aldhelm Box ground and Corsham Down stone, from the quarries of the Bath Stone Firms, Limited, Bath, was supplied.

ELECTRICAL.

AN inquiry has been held at the Yarmouth Town Hall relative to the application for a further loan of 17,500l. on account of the electric light scheme. It was explained that the first loan for the electric light was for 16,000l. and that this was followed by another of 1,500l. to make good the deficiencies in the first estimate. Of the present application 2,000l. was for connecting up 150 customers and 15,500l. was for extensions to plant.

THE distribution of electricity for power purposes in St. Louis, U.S., is, it is stated, furnished by three companies. It has replaced steam in hundreds of small manufactories and elevator services, but it is in connection with street railways that it has accomplished its greatest work. There are nine companies operating 275 miles of single track, running 500 motor cars, with 20,000 horse-power of electrical equipment and 600 trailers. There are eight power-houses with a total electrical equipment of about 23,000 horse-power.

AN extension of the electric-lighting system in Aberdeen has been agreed to by the gas and electric committee of the Town Council. The mains will now be laid along Bridge Street, a number of applications for supplies of current having been lodged from occupiers of premises in that thoroughfare.

AT Ayr the extension of the electric mains, it has been intimated, will cost about 990l. It is expected the current will be available by the beginning of September.

THE members of the Leeds Association of Engineers have paid a visit to the central electric-lighting station of the Yorkshire House-to-House Electricity Co., and inspected the recent

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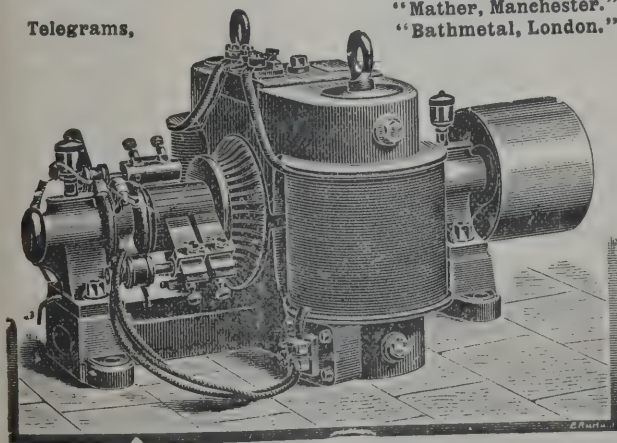
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extension of the plant. Two 400 indicated horse-power horizontal compound condensing Corliss engines, with cylinders 19 inches and 36 inches in diameter, by 3 feet stroke, have been added, built by Messrs. Hick, Hargreaves & Co., of Bolton, and fitted with their high-speed gear. Each has a fly wheel 17 feet in diameter, weighing 18 tons, from which is driven by means of ropes a 200 kilowatt Hall dynamo of the multipolar alternating current type, having 7 tons of revolving magnets and sectional armature. The dynamos work with remarkable smoothness. The total power capable of being developed by all the dynamos is 700 kilowatts, but the foundations are nearly finished for another 400 horse-power engine by Messrs. John Fowler & Co., Leeds, fitted with the Marshall-Wigram gear, which will raise the total electrical power to 900 kilowatts. The working pressure in the mains is 2,000 volts, and the dynamos are self regulating within about 15 per cent. The company began business two years ago with 4,000 lights on circuit, and they have now 26,000 8 candle-power lights. The boiler-house contains six Lancashire boilers, 30 feet long by 8 feet diameter, having mechanical stokers, feed water heaters, &c., and each capable of evaporating 8,000 lbs. of water per hour from 212 degs. Fahr.

VARIETIES.

A SCHEME for the removal of an unhealthy area in Hull is under consideration by the unhealthy dwellings sub-committee of the Corporation, as to the expediency of declaring insanitary a very large area, extending practically from Lower Union Street, through Trundle Street, to Waterhouse Lane. The scheme is an extensive one, and beset with difficulties; but perhaps the chief difficulty which will have to be faced is as to what shall be done with the property when it is declared as unfit for human habitation, for it appears that while the Corporation have power to close the dwellings in the locality, they cannot remove them.

THE sanitary committee of the Manchester Corporation have recommended that an application should be made to the Local Government Board for power to borrow 12,000*l.* for the purposes of the Manchester Dwellings Reconstruction Scheme, 1891.

AN inquiry has been held at Failsworth into the application of the Council to borrow 9,000*l.* for works of street improvement.

AT Burslem a public inquiry has been held with respect to an application by the Town Council for sanction to borrow 6,500*l.* for the purposes of public walks and pleasure grounds, 3,130*l.* for street improvements, 1,250*l.* for works of sewerage, and 128*l.* for the redemption of certain tithe rent-charges.

NOTIFICATION is given of an intended application to Parliament in the present session for leave to bring in a Bill and to pass an Act to extend and apply the provisions of the Joint-Stock Companies Arrangement Act, 1870, to the Kent and Surrey Permanent Benefit Building Society, in the same manner as if it had been a company liable to be wound up and were in course of being wound up under the Companies Act, 1862. The Bill will contain clauses conferring on the judge of the court in which the winding up of the affairs of the Society is proceeding the powers given to the court by the Act in question, and providing that, "for the purposes of any compromise or arrangement, all persons who have deposited with or lent money to the Society, and whose deposits and loans have not been repaid, shall be deemed to be creditors of the Society."

WITHIN the last week serious fires have been reported from various parts of the country. In the dry and hot weather of late experience more than ordinary care should be exercised. Windows and doors have to be kept open to mitigate if possible the effects of the hot weather, and in case of an outbreak every inlet afforded to the outside air must help to fan a fire.

PART of the extensive cotton manufacturing works of Messrs. R. Haworth & Co. in Ordsal Lane, Salford, have been destroyed by fire, which broke out in the "beam shed," a large building in which cotton in various stages of manufacture was stored. Damage to the amount of from 15,000*l.* to 20,000*l.* was caused.

AT Yarmouth a fire broke out in a large block of premises in the possession of Mr. J. R. Swanston, in close proximity to the Artillery barracks. The water supply was inadequate, and the buildings, valued at 10,000*l.*, were destroyed.

THE brush factory at Pontefract of Wigfall & Sons was, on Tuesday, demolished by fire, damage being done to the extent of 15,000*l.*

AN owner of houses at Fulham was fined 10*l.* and costs at West London Police Court on Tuesday, for failing to supply them with a proper water supply until they had been occupied for some months.

THE long-continued drought and the increased consumption of water in Glasgow during the last few weeks have seriously affected the sources of supply.

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BUILDING AND BUILDERS.

At the meeting of the Partick Dean of Guild Court, Messrs. Alex. M'Ewan & Sons, builders, Partick, were granted lining to erect seven tenements of dwelling-houses in Church Street and Thomson Street, the estimated cost being 8,000*l.* Peter M'Kissock & Sons, to erect a villa in Park Gardens North at a cost of 1,200*l.*, and twelve self-contained houses in Crow Road at a cost of 3,000*l.* George Anderson, builder, Whiteinch, to erect four cottages in Park Street, Whiteinch, at an estimated cost of 1,200*l.*

At a special meeting of the general committee of the Walsal Hospital, plans were adopted for the restoration of the buildings which were wrecked by the late gale, and the addition of others, at a total estimated cost of 2,700*l.*

At the fortnightly meeting of the Paisley Dean of Guild Court, a warrant was granted to the directors of the Industrial School to erect a dining-hall, gymnasium and swimming-bath at the Industrial School, Albion Street.

In the Govan Dean of Guild Court a lining was granted to Messrs. Speirs & Co, Glasgow, to erect a Congregational mission hall in M'Lellan Street in connection with Trinity U.P. Church. The hall will seat 240 people.

The Peterhead Police Commissioners have decided to erect a model lodging-house, capable of accommodating fifty lodgers, at a cost of 1,250*l.*

At the holding of the Ayr Dean of Guild Court warrants were granted to David Campbell for a villa in Blackburn Road, and to Robert Harvey for a villa in St. Leonards. The burgh surveyor reported that during the past year seventy-nine linings had been granted, as compared with seventy-eight in the previous year. The fees paid were 63*l.* 8*s.*, as against 63*l.* 7*s.* 6*d.* for the preceding year. The value of the buildings passed by the Court was 72,000*l.*, an increase of 4,000*l.* over the previous year.

The Crewe Tradesmen's Association have asked the Town Council to adopt a more moderate scheme than erecting an isolation hospital at a cost of 8,000*l.* The request cannot be entertained, as the proposed hospital will only provide accommodation for present requirements.

In the Edinburgh Dean of Guild Court eleven out of twenty applications for various buildings were passed.

ILLUSTRATIONS.**THE CHAMPION ATHLETE.**

ENTRANCE HALL, JUNIOR CONSTITUTIONAL CLUB, PICCADILLY

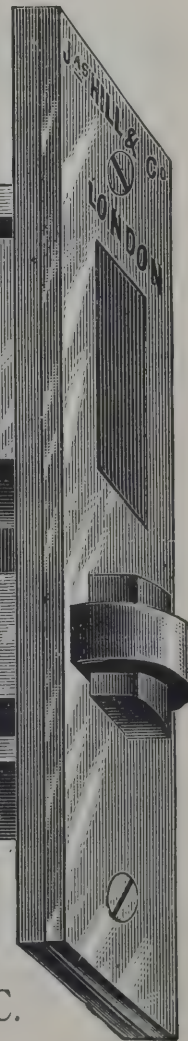
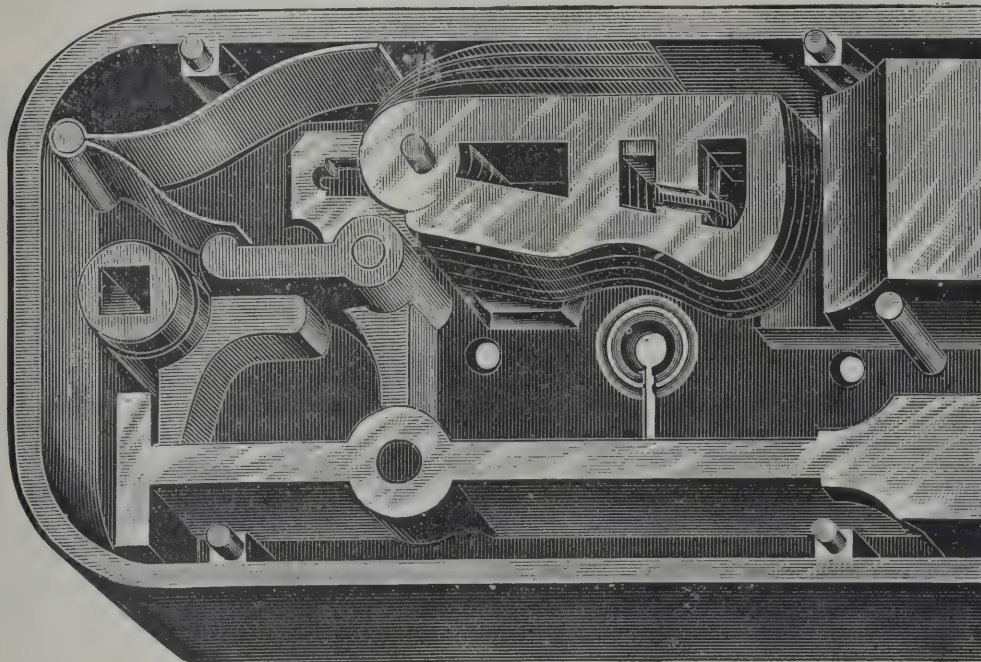
DETAIL OF ARCHWAY, TEMPLE GARDENS.

"SANITAS."

UNDER the above title, the Sanitas Company, Limited, of Letchford's Buildings, Three Colt Lane, Bethnal Green, E., have published an excellent brochure on "Sanitas" disinfectants and appliances, with an historical sketch relating to them (including directions as to their use), and the science of disinfection. Many medical and other expert reports are embodied in this work, which show that the labours of the company in sanitary directions have been universally appreciated. We can well commend this little work to perusal, not only by those mainly responsible for securing the best sanitary conditions for their clients, but by the general public as well. The company have evidently paid great attention to what nature has provided in the way of disinfectants, though nature has left us to exercise the necessary amount of skill and invention to utilise them, in much the same way as medicines and drugs are obtained from mineral or vegetable sources. Localities in the neighbourhood of pine forests have long been supposed to be of exceptional advantage from a health point of view; also the ozone from the sea. The eucalyptus, or gum-tree, as it is popularly called in Australia, has been often planted in malarial districts, with the result that lands hitherto useless, and on which no one could reside, are now inhabited and under cultivation. We have, then, mentioned three among other of the valuable sanitary agents, and the natural sanitary products have been so ably dealt with that they are combined with a variety of other substances, and also in a variety of forms, that bring them into practical use. These varieties have, of course, separate names to denote their special functions, viz. Sanitas fluid, Sanitas oil, fumigating candles, powders, &c. Filters, among other things, are provided. The Sanitas soap we might call special attention to, as it is just brought out. In conclusion, it may be remarked that the range for use of these combina-

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tions is wide. They are not only intended to keep houses, &c., in a perfect sanitary condition, but extend to the curing of diseases, also are beneficial in consumption, excellent for animals, freeing them from mange and the attacks of vermin, most useful in laundries, &c. The soaps, among other kinds, include toilet soap, family soap, dog soap, soft soap, soap powders, &c. A number of excellent testimonials are also given.

TENDERING IN VICTORIA.

PERHAPS there is one paragraph in Mr. Blackburne's annual address to the Architectural and Engineering Association of Victoria which commends itself, says the *Building and Engineering Journal*, more strongly than any other to public consideration, and it is this:—"One of the unsettled questions in all Institutes is, Whether the architect is entitled to be paid the fair value of the work when a contractor takes it far below the real market value, as in many instances is done, as he has in reality a greater anxiety in the supervision to secure his client proper work?" It is astonishing how many of the professional men—of Victoria especially—lend themselves to a suspicion of participating in "hole-and-corner" work by refusing information to the Press upon the tenders sent in for various contracts, and, as a rule, it is these firms with whom many builders have experienced such bitter trouble and such ruinous losses. The publication of tender-lists sanctioned by the Parliament of New South Wales has already given the greatest satisfaction, and is the best protection possible against fraud and corrupt practices. Every firm of good architects is either bound strictly by his client's limit of costs, or with his sketch-plan gives them an accurate total estimate of value before preparation of specifications; they then honourably prepare these specifications to fill to the client's best advantage the limit of cost, and in so doing calculate a fair percentage of profit for the builder. Then tenders are called for, and out of thirty sent in for a 2,000*l.* or 3,000*l.* contract there will be found a difference of many hundreds of pounds, and as a rule—*veritas in media*—it will be found that the one nearest the average amount is as nearly as possible the fairest tender of the whole number—that is, the highest amounts are "grabs" of chance at a lucky haul, and the lowest too frequently the desperate plunges of builders who, having nothing whatever to lose, "cut" the price, and trust to Providence to raise the materials for them, which, as is too well known, are frequently never paid

for, the first draw being the signal for collapse, or even disappearance of the builder. If this be not the case, then a still more distressing reason may be found in some omission or error of the contractor who too late discovers this, and is caught fast in the meshes of "Conditions" already duly signed. How many such instances could we not record in the past few years? By the publication of the tender lists there is a great safeguard raised for the builder and for the merchant, because a very fair estimate of cost is always obtainable, and a man who "cuts" desperately would be shunned by the merchant if he sought credit. If the architect snatches at a low estimate in his client's interest to curry favour with him he does a dishonest thing, because having computed the value it becomes evident to him that there must be some error or dishonest intention in such an estimate, and by adopting it he "conspires to defraud." The puzzle is in these matters why the architect should in adopting these estimates forfeit a portion of his own remuneration by the loss of commission; but perhaps there is often the weakness of "being thought clever" by his client to tempt him in this direction in a lively anticipation of favours still to come from the same direction. Mr. Blackburne does not suggest a cure for this trouble, and looks at it only from the point of view of an architect who would yield to the will of his client against his own conscience, and thereby become an unwilling sufferer by the carelessness or dishonesty of the builder. Happily, we think, such instances are rare; and the client who trusts his affairs to a firm of good architects would in such a case also be guided by their assurances that the lower estimates were too low. Unfortunately, a scarcity of work induces this cutting of prices, and it would not do to judge all cases by any one instance of dishonesty, because there are firms of contractors who have perhaps stocks to clear, a special facility for buying or producing, who will work at a very low rate to "keep the mill grinding." Such instances are for the advantage of the client, and, provided the architect is assured that there is ample guarantee of the contract being completed, he is bound to watch his client's interests, and accept the opportunity, even if it should cut against his own remuneration in commission returns. Still, however, we get back to the same sources of these evils, the suppression of tender lists by architects, which are well known to have encouraged and cloaked many wrongs, and resulted most disastrously to builders and merchants. It is fair to every tenderer to know how he stood as against other competitors, and every claim on behalf of honesty and honourable conduct may be urged in favour of publicity, and

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every condemnation of wrongs which are cloaked or rendered possible under the suppression of such information. The English practice of accepting the tender which is nearest the average price and estimate of cost is by far the safest system, and it would surmount all difficulties, rare though they be, which are suggested in this isolated but very important paragraph in Mr. Blackburne's address.

SAFETY APPLIANCES FOR ELEVATORS.*

ALTHOUGH numerous papers on lifts have been read and discussed at meetings of the different learned societies and institutions, the accessories have never received any other than the merest comment. The author has therefore selected the details of safety appliances as the subject of the present paper, as he considers it of the utmost importance. With the memory of the sad death of a member of the profession in his mind, the author offers no apology for the subject of the paper; but the contents are another matter, and on this score he would crave the indulgence of the meeting.

The first weak point in hydraulic lifts, which is patent to all, is the effect of any hammer action that arises when the machine is stopped or started suddenly. This shock is in no way transmitted to the mains, as consumers are always required (where the supply enters their premises) to fix a valve which shall not only act as a stop-cock but also as a back pressure and retaining valve, in order that any failure in the power supply will not affect the machine so as to cause it to descend. This stop valve thus concentrates any shock on the pipes within the building, and they have to bear all the sudden increase of pressure. To relieve this stress to which the pipes would be subjected, relief valves are sometimes fixed, although the author ventures to think not often enough. In direct-acting and suspended lifts the danger resulting from any pipe connection breaking is infinitesimal, since diaphragms are, or should be, always placed in the joint next the cylinder in order to regulate the speed of the lift in its ascent, and this will similarly prevent any excessive velocity of the cage when descending. The orifice in this diaphragm should always be well tapered on both sides so that the loss of pressure may be minimised to, say, 3 per cent.

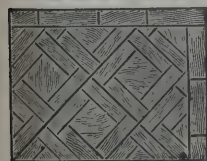
* From a paper by Mr. H. W. Umney, read at a meeting of the Society of Engineers on June 10, 1895.

When the well-known Paris accident brought about the abolition of the practice of balancing the dead weight of the ram and cage in direct-acting lifts by overhead gear, and the introduction of hydraulic balances, makers who hitherto had considered this class of lift inherently safer than those which depended upon the support of chains or ropes, did not hesitate to state that they were now absolutely safe. In water-balance lifts, however, the diaphragm to regulate the speed of its ascent is of necessity put into the power cylinder, and is therefore not such a protection from risk as in the case of a simple direct-acting or suspended lift; for it is impossible to place any diaphragm in the connection between the hoisting and balancing cylinders. Hence should the pipe (which is usually 2 inches diameter in order that the water may oscillate freely) fail, the full weight of the ram, cage and passengers act to force the water out of the cylinder. To provide against the obviously disastrous effects consequent on the failure of such a pipe, ram grips were made of various designs.

Grips, however, were not considered by Sir Frederick Bramwell sufficiently reliable for the safety of passengers travelling in direct-acting hydraulic lifts fitted with water balances, so he required that a brake-valve should be made and fitted on the four lifts at St. Bartholomew's Hospital in order to minimise any risk. The valve is fixed as near as possible to the lifting cylinder. Under ordinary working conditions the pressure on either side of the valve does not vary more than 20 lbs., so that a light spiral spring will easily keep the valve open. Should a pipe burst the pressure on the upper side of the valve is relieved and the valve closes, leaving only a small hole for the water to escape through. This hole is usually about a quarter of an inch diameter, so that the sudden closing of the valve does not cause any shock, and the lift is enabled to descend gradually. The author then showed the effectiveness of a diaphragm (and this valve merely acts as one) by computing the speed at which the lift at Lloyd's Registry fell compared with the rate that it would have descended if fitted with only such an orifice as was necessary to obtain the maximum speed of ascent. If the ordinary 2-inch pipe connection, without such a diaphragm, between a balance and hoisting cylinder, were to break, the speed at which the lift would descend would be not less than sixteen times as great as usual.

Having referred to diaphragms as a safeguard from pipe failures, the author next directed attention to gear fitted on cages so as to arrest their motion when the hauling chain or

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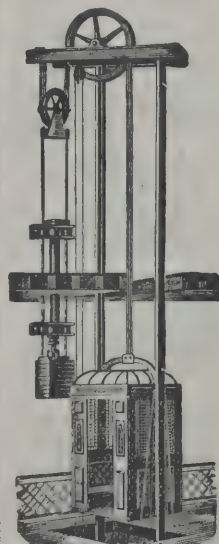
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ropes fail. In one of the earlier arrangements the cage is made with a strong angle-iron frame suspended from two flat plates by bars and tie-rods in order to insure rigidity. In the centre between these plates, to form a means of suspension, a flat eye-rod is passed and held on the under side by a spring and nut. On either side of the cross bars are shafts, fitted at both ends with serrated cams, and at the centre levers are keyed. Each of these levers is connected by a pair of links to the eye-bolt, so that when the cage is suspended the spring is deflected and the levers raised, so as to free the cams from the guides between which the lift runs.

When the hauling chain breaks the force of the spring rapidly pulls down the eye bar and the cams grip the tee irons, which in this case serve as guides. A modification of this arrangement is where, instead of cams to grip the runners, spikes are forced out into the guides. With these gears, however, it is necessary that the guide bars should be of a very rigid construction to resist the thrust of the arms. Safety gear is now hardly ever fixed on the top of cages, because it is then necessary to construct a far heavier frame than would be required to carry the load, lest, under the dynamic stress resulting from the motion of the lift being arrested by the safety gear, the bottom of the cage should fall out, as it did in one instance which came directly under the author's notice. The exceptions to this form of construction are few, except when the load is considerable and the goods bulky.

With improvements in steel wire rope manufacture the lifting chain gave place to a rope, and the single rope in the case of a passenger-lift to two or four ropes. This greater number is now most common, and the author would here trespass for a moment on ground which received but a cursory glance from Mr. Carey, in his interesting paper on "Hydraulic Lifts," read before this Society on June 5, 1893. The author has no hesitation in asserting that when four ropes are used they should each and every one bear an equal share of the work for the reason that, should any pair of ropes be made to carry the load, those running idly would depreciate by constant bending to such an extent that when suddenly called upon to bear the burden the dynamic stress would be too great for them, and the cage would be left to the action of the safety-gear. If a rope under tension is bent round a pulley, the resistance will be that due to the bending of the individual wires as beams, plus that due to the increased stiffness given to the wires as a whole, on account of their being laid into one another. The resistance to bending, on the part of the individual wires, is

highest where small pulleys are employed, and bending in these cases is often the direct cause of by far the greatest separate longitudinal stress in the wires themselves.

The size of rope commonly used for lifts is $1\frac{3}{4}$ inches circumference, composed of thirty-six wires of No. 20 B.W.G., with a modulus of 33,000,000 lbs. The calculated stress in tons per square inch on each wire due to bending round a 24-inch pulley is no less than 22 tons, which is increased to 50 tons on a 10 $\frac{1}{2}$ -inch pulley.

Again, the life of ropes made in the ordinary way is not more than one-half that of those in which the wires are laid in the same direction with the strands, on account of the cutting action of the wires on one another, but which is reduced to a minimum in the type of rope known as Lang's lay.

A consideration of the conditions under which a portion of lift ropes work will show they are not too favourably used, but are subject to reverse stresses whereby the life of the rope is reduced by one-half. The size of pulley required for such a rope as indicated by theory, according to Professor Unwin, should be 28 inches, and this agrees with that determined by calculation from an empirical formula made by Professor Goodman to suit these practical experiments ($N. + 35,000$) ($27.5 - D$) = 880,000, where N. is the number of bendings necessary to cause fracture and D. the diameter of the pulley in inches. Thus when N. = infinity, D. = 27.5 inches. It will therefore be seen that manufacturers of lifts do not far transgress by using a 2-foot pulley in order to insure that the ropes do not wear out rapidly.

Now as regards the practical application of these remarks. How often should lift ropes be renewed? If a rope of Lang's lay, the size quoted, be not oiled it will stand 75,000 reverse stresses under a tension of about 15 cwt., and this will point to the advisability of changing the ropes every three years, in the case of a lift making two hundred journeys per day. He then described one of many arrangements of the gear now usually fitted to cages which showed a new departure in the principle underlying its efficiency, depending as it did on the increased tension of any one rope out of a number which may be employed.

After mentioning the remote possibility of all the lift ropes failing at one and the same time, he drew attention to the fifth rope adopted by makers, of which he approved when applied also as a means of checking any excessive speed of the lift while at work. He then illustrated the passing of such a rope round a governor, and also another means of attaining the same object

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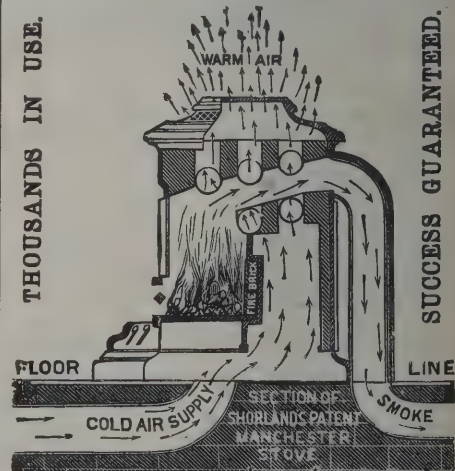
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in a simpler way by passing the rope over a pulley and attaching it to a small weight, which would actuate the gear by virtue of its inertia when the speed of the cage became abnormal. He pointed out that this latter arrangement acted very well as a safety gear by itself, since its effectiveness varied not merely as the velocity, but as the square of the velocity of the falling cage. He also observed that this gear could be made still more effective by making the weight pass up and down a closed tube which it fitted fairly tightly.

THE CORPORATION GRANARY, GLASGOW.

DAMAGE to the estimated extent of 12,000*l.* was caused by a serious outbreak of fire on the 5th inst. in a granary belonging to the Glasgow Corporation Tramway Department, and situated alongside the extensive Kinning Park stables in the south-west district of the city. The stables and granary, says the *Glasgow Herald*, were handsome buildings, completed a little over a year ago. Two storeys in height, and constructed of brick, the stables and car sheds cover an area of 80 by 50 yards, and have tasteful elevations to St. James's Street and Great Wellington Street. The granary, where the fire occurred, was separated from the other buildings, and was a five-storey brick erection, about 80 yards long by 20 wide. Its frontage was to Park Street, and extended from St. James's Street to Great Wellington Street. The eastern portion was used for the storing of grain and the western section for the storing of hay, while the central part of the building contained the machinery for the bruising of the grain, the cutting of the hay, and the mixing of the hay and grain in the proper proportions for horse food, preparatory to the daily distribution of the stuff to the several districts. About five or six weeks' supply could be stored in the granary at a time. The buildings throughout were lit by electricity, and as a protection against fire the partition and outer walls were of great thickness, while iron took the place of wood in the construction of the building wherever practicable.

The fire broke out in the western portion of the granary, where the hay and straw were stored. This part of the building was some 110 feet long by 60 feet broad and 60 feet high. It had an outer wall 2 feet 8 inches thick at the bottom, and gradually decreasing in thickness towards the top, and was separated from the machinery department by a division wall

2 feet 9 inches thick, pierced by iron doors on each flat. Some idea of the size of this portion of the granary may be gathered from the fact that there were no fewer than 192 windows facing Park Street, forty facing Great Wellington Street, and sixty-four looking into the stable-yard at the back. The outbreak was discovered by the workmen about half-past eight o'clock in the morning. It had taken place in the third storey. With the aid of a fire-hose attached to the *dépôt*, the workmen made a strong attempt to extinguish the flames, but the fire spread so rapidly amongst the dry fodder that their efforts were of no avail. A fire-alarm connected the stables with the southern fire station. This was rung, and detachments of the brigade from the central and southern stations were soon on the scene with a couple of engines. By the time firemaster Paterson and his men arrived the flames were shooting through the roof, and it was evident that the hay store could not be saved. The efforts of the firemen were, therefore, directed towards saving the machinery portion of the building. All the connecting doors in the partition wall were securely barred, save one or two at which firemen were stationed, and poured powerful jets of water on the burning mass at the other side. About half-past nine o'clock the roof fell in with a mighty crash, and the released flames flared up into the heavens. Fortunately what wind was blowing came from an easterly direction, and greatly aided the men in their endeavours to prevent the fire spreading eastwards. By ten o'clock the interior of the burning building had the appearance of a great oblong furnace. Only the great walls remained standing, and these showed wide cracks extending downwards to the third storey. The fire had almost spent itself by one o'clock, and most of the firemen were withdrawn, but a few were told off for the greater part of the day to pour water on the smoking ruins. The hay store was completely gutted, and the roof of the machinery building was also partially burned.

COMMERCIAL EDUCATION IN BELGIUM.*

IT is not so very long ago that, in England, there were only three classes of schools for the education of youth. The public schools, such as Eton, Harrow, Charterhouse, &c., for the sons of the upper classes; private proprietary schools for the boys of the middle class; and the parish schools—now called Board

* A paper read by Mr. William Layton at the Society of Arts on May 21.

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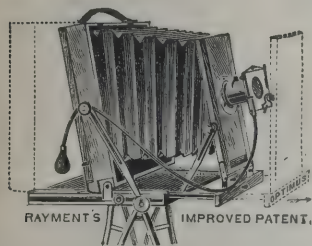
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schools—for the children of the lower classes. In the first of these Latin, Greek and mathematics formed the chief items of the curriculum. In the private schools many subjects were taught, but few were learned; and in the parish schools the acquisition of the three "r's"—reading, writing and arithmetic—were thought amply sufficient in regard to education for those who were destined either to work the loom, to build the house or to plough the field.

But, happily, we have changed all that, and in our day education is making such rapid strides that knowledge is within reach of all. In fact, some enlightened men are asking themselves whether or not we are going too far and too fast. This is a question I do not propose to discuss; it is not within my province. I simply wish to put before you to-day what is being done abroad in regard to commercial education, so that you may be able to judge whether or not, in this one respect, England is keeping pace with other countries.

England was once called a nation of shopkeepers; this was the stigma put upon our country by a great military commander; a bit of spleen emanating from the mouth of one who thought that glory to a nation was acquired only in the pursuit of arms. Of one who knew not that peace hath its victories as well as war; of one who ignored the ladder by which he himself had mounted to fame. It is, unhappily, even to-day the custom among a certain class to look down upon trade; and this contempt is never more loudly manifested than by those whose immediate ancestors have made their fortunes by trading. But, like Napoleon I., they forget that the prosperity of a country wholly depends upon its commerce, and that military glory can only be achieved by those whose one object in fighting is to protect the trading interests of their country. We see that Russia is thirsting for this military glory to-day; she is ready and perhaps anxious, to move her battalions across the frontier, but she cannot do so because she is poor; because her commercial and industrial activity has not kept pace with the thirst for territorial aggrandisement, and she is obliged to remain at peace simply because she is lacking in the sinews of war.

History shows us that the pursuit of commerce has ever been the mainstay of nations, and, without too much boasting, an Englishman may say that the glorious supremacy of Great Britain on land or on sea, throughout the world, is due to the fact that her commercial prosperity has enabled her to retain, by force of arms and length of purse, those vast territories which, in the first instance, have been obtained for her by

doughty pioneers who have gone forth to trade with the natives of far distant climes. Yes, we are proud of being a nation of shopkeepers, and hitherto we have been able to hold our own against all comers.

But—and there is a but in the case—signs are not wanting that Great Britain is no longer commanding foreign markets as she did only a few years back. Reports have been sent in by our Consuls abroad, showing that orders are now being sent to Germany, to Belgium and the United States that were wont to be exclusively forwarded to our great manufacturing centres; and the Board of Trade returns have lately shown that in many cases there has been a considerable falling off in our imports. Mr. Consul-General de Courcy-Perry, from Odessa, was one of the first to give the note of alarm. Mr. James Baker, in his little book entitled "Our Foreign Competitors," gave point to it by showing that Germany was cutting us out in many of our own fields of industry; and when at length Englishmen opened their eyes to the fact, the question was generally asked, "What must be done to keep the world's trade in English hands?"

Far-seeing men at once realised the truth of what Mr. de Courcy-Perry had proclaimed, viz that England was not being represented abroad by efficient commercial travellers, by men who could speak the language of the people among whom they travelled, and thus ascertain what was wanted on the market which their employers wished to serve. Other nations were represented by men who had the gift of tongues, and these booked all the orders. The Englishman worked hard with his interpreter always by his side, but he was never in touch with his customers, and at night his order-book was still empty.

Then came the cry for higher commercial education, and, thanks to such men as Colonel Howard Vincent in the House of Commons and Sir Albert Rollit at the London Chamber of Commerce, a forward movement was effected, and, as you know, much has already been done to give to lads destined for a commercial career an education which will fit them to compete successfully in that great commercial struggle which is now going on in all the markets of the world, and which will be more intense as the new nations further develop their industrial activity. As a proof of this, are we not told that Japan is already bidding for a part of the world's custom? The Japanese have shown themselves apt pupils of their European teachers in the art of war; they will likewise show themselves apt pupils in the arts of peace.



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It has always been said that the counting-house, warehouse or shop has been the fittest school for the lad destined for trade. This idea, at any rate, has obtained in England, and the boy of fourteen has been taken from his books to be placed in an office where, in copying letters and running errands, he has been supposed to pick up that training which fitted him ultimately to become a merchant or a manufacturer. Formerly, when international communication was very slow, many came out of the ordeal successfully, and it is not an uncommon thing to hear a prosperous business man boast that he had little or no schooling. This was very well in the old days, before the invention of the steam-engine, of the telegraph and of the telephone. But these inventions gave, with their rapid means of international communication, a fresh impetus to trade. It was found that new men were now required—men quick to discern, quick to decide, their decisions being based upon a thorough knowledge of the state of the world's markets. Such knowledge cannot be gained by those who stay at home within the narrow limits of an office, and whose mental powers have no other foundation than the limited amount of instruction they received at a proprietary school.

In France many years ago this fact was recognised by all thinking men, but it was reserved for Belgium, struggling to find work for her dense population, to be the first to give practical effect to the idea of establishing a special school for the commercial training of her young men. In 1851 our Prince Consort organised the first International Exhibition of All Nations in Hyde Park. His aim was to compare the progress made by the different nations in the industrial arts. The exhibition was a success, and it showed us—Englishmen—that we held the first place. But other nations profited by the lesson. They began to ask themselves if they too could not do something more than they had done in the past to promote their home and foreign trade, and Belgium saw that something could at once be done if she had but competent men to represent her in the foreign markets. Hence in 1852 some public-spirited men, under the leadership of M. Rogier, then Minister of the Interior, approached the Municipality of Antwerp and the Belgian Government with a view to the establishment of a commercial university. The idea was at once adopted; and before the year 1853 closed the "Institut Supérieur de Commerce," or Commercial University, was opened at Antwerp. It succeeded from the very outset, owing to the soundness of the principles on which it was established, and ultimately became the model upon which similar institutions were founded in France,

Switzerland, Germany, Italy, and even in distant Japan. In giving you this evening a sketch of what is being done in regard to commercial education in Belgium, I shall practically be telling you what is also being done in other countries abroad.

The first difficulty with the promoters of the scheme was the financial one, as in Belgium there were many people who still adhered to the old notion that a small amount of education sufficed for a man destined to be a trader. But the Government at that time was an enlightened one, and with the memory of Hyde Park still fresh in the minds of the Cabinet, it decided to share the expense with the City of Antwerp Corporation. The terms were at once agreed upon, and, as I said before, the classrooms were opened in 1853, and fifty-one students were at once enrolled. And from that day to this the Institute has steadily increased its usefulness, in proof of which we find that to-day its courses of lectures are frequented by young men from all parts of the world. It may be useful here to give some statistics on the steady increase in the "population" as the French say.

At the end of the first four years 316 students had been enrolled, of whom 226 were Belgians and ninety foreigners.

During the next four years 348 students, of whom 191 were foreigners.

At the end of 1867 there were 358 students, 194 being foreigners.

At the end of 1872, 571, 229 being foreigners; 1877, 666, 294; 1882, 637, 227; 1887, 683, 281; 1892, 945, 406; and when the next quaternary period shall have reached its term, we shall be able to report a still larger increase in the numbers.

It will doubtless be remarked that it is owing to the presence of foreigners that the numbers have so rapidly increased. This is a fact, but it must not be inferred that the appreciation of the Institute has declined in Belgium. This is easily shown when the figures are studied, for in the first quaternary period there were 226 Belgian students, whereas in the last, that ending in 1892, there were 539 students of Belgian nationality, that is to say, the numbers had trebled.

And this is not to be wondered at when we consider that, of the old students, there are at this day 249 who occupy the position of chief in the most important mercantile firms of the country; 218 who are bank managers or commission merchants of high standing; 5 are Belgian consuls-general; 4 are consuls; 5 vice-consuls; 8 others have served the country as acting consuls-general, and one old student is the Home Secretary for the Congo Independent State. In addition to which I may

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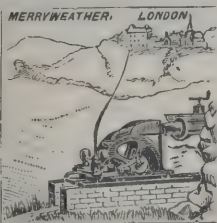
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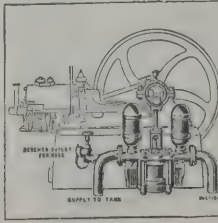
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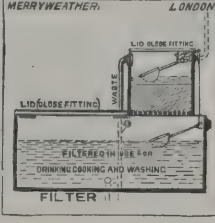
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mention that some old students have themselves become professors of commercial sciences in the establishments modelled in foreign countries on the same lines as the Antwerp Institute. This notably is the case at Odessa, Rheims in France, and at Tokio in Japan.

I have introduced these facts in order to show at the outset that the Institute has served the purpose for which it was founded, for it cannot be gainsaid that there are still many business men whose opinions are entitled to respect, who maintain that a school for higher commercial studies has no *raison d'être*. I venture to think that the success in life of the Antwerp students proves the contrary.

For the details of the curriculum I must refer you to the prospectus of the Institute. I will briefly state that the branches of study include all subjects a knowledge of which is indispensable to the merchant, banker, or trader, who wishes to succeed in life.

The students are divided into two classes—the "regular" and the "free." The former attend all the lectures with a view to obtain the diploma or degree at the end of the two years, which period constitutes the prescribed course of study. The "free" student is one who follows only the courses of lectures which he considers of paramount importance to him in his commercial career.

A regular student must pass an entrance examination, in which he must show a competent knowledge of two foreign languages, in book-keeping by single and double entry, in geography, history, natural philosophy, chemistry, geometry, arithmetic and algebra, commercial law and the elements of political economy. In short, the subjects generally demanded for matriculation at our own universities.

A free student need not present himself for this examination, as he is always free to cease attending the classes when once his particular object shall have been attained.

The course of instruction upon which the student enters, after passing his entrance examination, is practical as well as theoretical. The transactions of a large commercial house are simulated, the operations of a counting-house minutely practised, and all questions relating to the theory of exchanges are accurately described. The correspondence of the "office" must be conducted by the student himself, and that too in French, German and English, which languages are obligatory. He must also be competent to correspond in one other foreign language, the choice generally being either Spanish, Italian, or Dutch, a professor of each of these languages being on the

Institute staff. The principles of political economy, of international commercial law and customs' legislation are also inculcated; and special care is taken to make the students acquainted with foreign markets by furnishing them with reports sent in periodically by Belgian residents abroad.

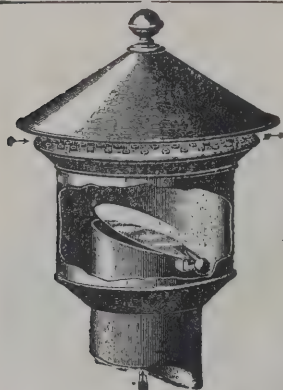
In regard to a knowledge of all kinds of vegetable, mineral and animal produce, there is a well-furnished museum, with samples and patterns kept up to date, so that the professor is enabled to give to his pupils a practical knowledge of the article in which the latter will one day be called upon to trade. The geographical and economical condition of foreign countries is studied from carefully compiled data, and the relative value of raw material, from different sources of supply, is inquired into and noted.

The student is also encouraged to take a close interest in the political events of the day, so far as these affect commercial interests; and the latest consular reports from all countries are placed at his disposal, so that he himself, later on, may be in a position to make a report upon the commercial prospects of any country in which he may happen to find himself.

In the spring of each year the principal mines, factories, mills, &c., of Belgium are visited by the students, accompanied by one or more of the professors. In this way the young fellows acquire an insight into the actual working of those industrial establishments which have done so much to give to Belgium that measure of prosperity which she to-day enjoys.

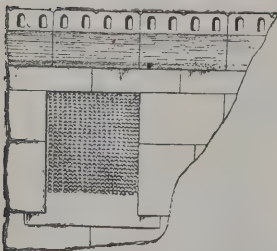
Another important feature of the Antwerp Institute is the bestowal of travelling scholarships on the most deserving students. These are naturally limited to those of Belgian nationality. A sum of nearly 2,000*l.* per annum is devoted to this object. A student who has passed his final examination with credit is entitled to offer himself as a candidate for one of these scholarships, or "bourses" as they are called. If one be granted, he proceeds abroad, with the certainty of enjoying, for three years at least, an annual income of 200*l.* He is thus relieved of the necessity of accepting the first situation that is offered to him; and can devote the whole of his time, if necessary, to the study of the economic condition of the country in which he resides. He must send home periodically a detailed report of the results of his observations; by his previous education he is enabled to do this with a good result, and these reports, after being noted by the Government, are utilised by the students in the prosecution of their studies.

Down to the end of 1892, sixty-two students had been thus



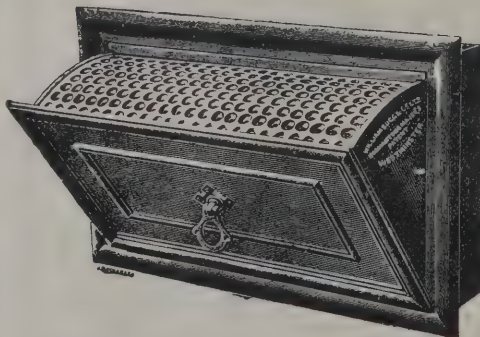
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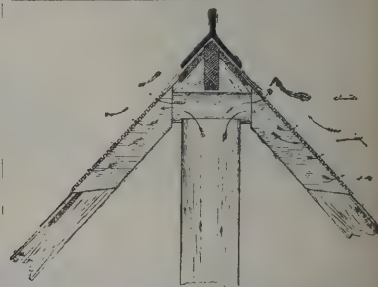


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sent abroad; the countries chosen for residence being Algeria, Morocco, the Cape, Japan, China, India, Canada, the United States, the Argentine Republic, Brazil, Colombia, Venezuela, Chili, Mexico, Cuba, Philippine Islands, Australia and New Zealand—in fact, those countries in which Belgium is seeking to place her manufactures. Of these sixty-two, twenty-seven have remained in the countries to which, as bursars, they proceeded, and are now doing exceedingly well as merchants or commercial agents; sixteen are established in European countries, also as merchants, and two have entered the service of the Japanese Government as teachers of the commercial sciences.

I have already said that other countries have followed Belgium in the steps she took to improve the higher commercial education of her youth, and at Paris a similar school has been established, which, though still in its infancy, is doing good work. It was not found practicable, however, to introduce into the French establishment such a high curriculum of studies, the result being that students, after studying for a year or so at Paris, come to Antwerp to finish their education. The same remark applies to the different schools in Switzerland, Germany, Italy and Roumania. Thus, as Antwerp took the initiative in introducing the system, the Institute has been looked upon as the model of such establishments, and its prestige is still undiminished.

To afford another proof that the promoters of the scheme really did supply a long-felt want, I may mention that in 1886, at Bordeaux, an international congress was opened, under the auspices of the French Government. The object was to discuss whether or not there did exist any necessity to establish "commercial schools," that is to say, establishments having a curriculum specially designed for the higher education of youth destined for a business career. This Congress was attended by many of the leading bankers, merchants and professors, not only of France, but of other countries; and after five days of close and careful deliberation, it was unanimously decided that to have followed such a curriculum as that pursued at the Institute at Antwerp was calculated most materially to aid a merchant in his career, and the French Government was requested to encourage the establishment of similar schools throughout the country. One leading merchant of a large French seaport rose in the Assembly and said that had he enjoyed the privilege of pursuing such a course of studies in his youth, he would have been saved at least five years of drudgery in the pursuit of that knowledge which has been so essential to his success.

The Institute of Commerce at Antwerp has also been the recipient of honours at the hands of juries at the following exhibitions, viz. Paris (1878), Brussels (1880), Antwerp (1885), Liverpool (1886), Melbourne (1888), Paris (1889), and Antwerp of last year.

It will now probably be asked what is the cost to parents of a higher commercial education, such as that given at the Institut Supérieur de Commerce at Antwerp. It is very small, the expenses of keeping up the establishment being borne by the Belgian Government in part, and the rest by the Antwerp municipality. But each student contributes, that is, pays a fee of about 10*l.* the first year and 12*l.* the second, the amount of which fees are paid to the professors as a supplement to their honoraria, thus following the custom of ancient Greece. This is called the "Minervale." The Government does its best to procure a really competent teaching staff, and pays so much a year to each "Chair," giving a pension to the professors after a certain number of years' service. There is also a fund to which the professors contribute a small sum yearly, for providing a pension for their widows and for their orphan children until they reach the age of eighteen years. The system works very well; the country has a fair return for its money by the extension given to its trade, and in allowing the professor to profit by the ever increasing number of the students, you give him every encouragement to keep himself *au courant*, and thus attract students to his chair.

As I have already stated, the study of languages is a strong feature of the Institute, and at the end of the two years' course there are very few of the young men who quit Antwerp without being thoroughly conversant with the languages most used in the world of trade. In fact, each student is more or less acquainted with three other languages, in addition to his mother tongue. I have known many cases where, say, a Roumanian has been able to write a commercial letter in French, German, English and Spanish. His own language has also enabled him to understand the same letter, if written in Italian, and his residence in Antwerp has given him a colloquial knowledge of Flemish, which to a very great extent is a provincial form of the Dutch language. In fact, the literary language of Flanders and Holland is almost identical.

It is this knowledge of foreign languages which in itself gives to the foreign trader a considerable advantage over his English competitor. It constitutes the most salient point, too, in comparing the attainments of a lad educated at home with those of one educated abroad. I am speaking of course only from a

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commercial point of view. The average schoolboy in England has a smattering of Latin and Greek. He knows how to do all the rules of arithmetic, and he does them well. His geography and history are perhaps faultless. But abroad he finds boys able to calculate by the metric system without either pen or pencil, and if he attempts to show that he knows a little of the classics, nobody understands him, for the simple reason that his pronunciation of the words is a thing to be shuddered at by the ordinary well-educated foreigner. But in England the schoolboy, although he may spend four or five years in the study of the French and English grammar, is seldom or never taught to express himself correctly in either of these languages, much less in Spanish and in Italian, whereas, as I have already shown, a lad educated in a continental commercial school generally has four languages at his fingers' ends.

Then, again, the student at—say the Antwerp Institute—is constantly brought into close contact with his fellow students from Russia, Roumania, Brazil, Japan and China. He forms an acquaintance with these young men, picks up a word or two of their language, and ultimately the friendship of youth develops into the business relations of riper years. Besides, such acquaintances enable him to increase his knowledge of men and manners, of foreign countries and of customs, and this alone, when he is launched upon the world, enables him also to approach his fellow men with a certain amount of self-confidence; and in his turn to inspire in them the conviction, to use a homely expression, that his head is properly screwed upon his shoulders.

Thus I think I have shown that the aim on the Continent is education rather than mere instruction; and it is this superior education, enjoyed by the foreign commercial traveller, by the foreign merchant and by the manufacturer, which gives them the pull over their English rivals, and allows them to push their trade in markets inaccessible to the representatives of English firms.

I hope I have been able also to show that a commercial institute or university does offer tangible advantages to its pupils, and I venture to hope that the day is not far distant when a similar "school of commerce" will be established in London. In the meantime English parents might avail themselves of the advantages offered by one of the continental schools. The Institute at Antwerp is open to all, but, of course, a lad must be able to speak and understand French before being able to follow the courses of lectures, all given in French. But in each town there are good preparatory schools,

and in the spring of each year special classes are organised at the Institute itself in order to prepare candidates for the entrance or matriculation examination, which is held in October.

In conclusion I must state that seventeen is the minimum age at which it is considered advisable for a pupil to present himself for admission. The teaching is entirely that of a university, so that it is essential that the young fellow be of a sufficiently serious turn of mind to follow attentively the courses without being subjected to school-boy discipline.

I shall be most happy to give any further information to inquirers, and the fullest information may always be obtained on application to the courteous director of studies, Dr. Edm. Graudgainage.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 10387. George Moseley, for "Improvements in gate fastenings."
- 10388. George Moseley, for "Improvements in door and gate-locks and latches."
- 10390. William Ernest Young Putman, for "Improvements in the construction of cisterns."
- 10421. Robert Thomas Spring, for "Cistern for water-closets."
- 10458. Adrian J. Moulart, for "Improvements in locks."
- 10479. John Holt, for "Improvements in window-sash fasteners."
- 10500. Charles Shakeshaft, for "An improved window-sash and line."
- 10834. Edward Traies, for "Improvements in water-waste preventers and flushing-tanks."

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The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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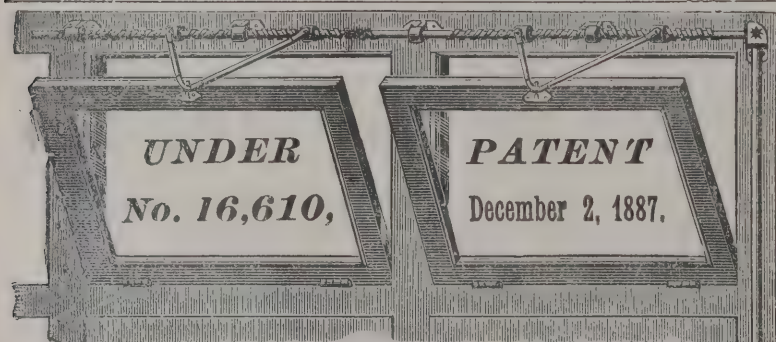
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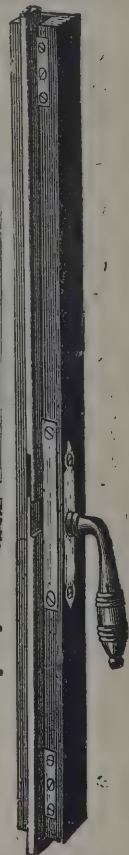
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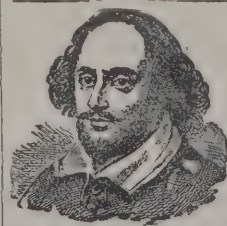
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T. Shore & Sons	170	0	0
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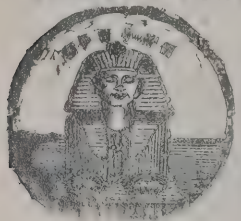
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PROOFS of this Illustration, which appeared in "The Architect" on June 6, 1885 (now out of print), can be obtained on application to the Publisher, price Sixpence each. post free: on roller. Ninepence.

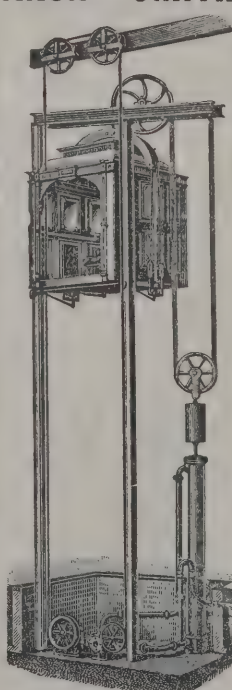
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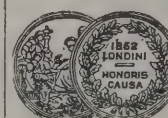
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HARTLEPOOL—continued.*Contract No. 5.—Flagging and Kerbing Commercial Street.*

H. Curry & Son	£61	10	0
G. Pickering	61	1	8
J. Howe & Co.	59	9	9
R. J. MARSHALL (accepted)	58	3	8

Contract No. 6.—Flagging, Kerbing, and Channelling Cleveland Road.

H. Curry & Son	397	0	0
G. Pickering	383	3	9
J. Howe & Co.	378	9	9
R. J. MARSHALL (accepted)	363	4	9

HUDDERSFIELD.*For Alterations at Workhouse Hospital, Crosland Moor, for the Guardians*

B. Graham & Sons, masonry	£883	0	0
B. Hirst & Sons, joinery	241	10	0
Mills & Garside, plumbing and glazing	149	0	0
J. Cook & Co, concrete work	81	12	6
Pickles Bros., slating	71	10	0
R. Heaton, plasterer	56	0	0
R. Heaton, painting	38	5	0

HULL.*For Erection of St. Wilfrid's Church, The Boulevard, Hull. Messrs. SMITH, BRODRICK & LOWTHER, Architects, Hull. Quantities by Mr. J. WATSON, Hull.*

A. Lyons	£3,672	5	0
F. Blackburn & Son	3,649	0	0
T. Goates	3,605	0	0
Skinner	3,589	10	0
F. Southern	3,583	0	0
G. Houlton	3,565	0	0
G. Jackson & Son	3,525	0	0
D. Robinson	3,480	0	0
J. Drury	3,478	0	0
F. Hall	3,348	0	0
COLLEY & LEVITT, Hull (accepted)	3,222	0	0

LAUNCESTON.*For Street Works, for the Launceston Town Council.*

N. Robins, Wadebridge	£311	10	9
J. FINNEY, Launceston (accepted)	277	14	5
E. Duke, Plymouth	275	19	10

ILFORD.*For Completion (Nave, Aisles and Porches) of St. Clement's Church. Messrs. J. E. K. & J. P. CUTTS, Architects, 34 Maiden Lane, Covent Garden.*

Taylor & Son	£5,437	0	0
Holloway Bros.	5,370	0	0
J. S. Hammond	5,359	0	0
Harris & Wardrop	5,350	0	0
W. Watson	5,300	0	0
A. Porter	5,287	0	0
Dove Bros.	5,185	0	0
Perry & Co.	5,185	0	0
A. Brown	4,900	0	0
S. C. Parmenter	4,810	0	0

KILLARNEY.*For Construction of 3,386 Yards Pipe Sewers, &c., for the Town Commissioners. Mr. THOMAS SCOTT, Engineer, Killarney.*

Gallwan & McIntosh	£2,386	5	4
J. V. Driscoll, Glin	2,185	17	2
J. Cunningham, Dublin	2,112	19	0
W. Johnson	1,972	17	0
M. WARREN, Killarney (accepted)	1,830	0	0
J. H. Peet, Tralee	1,787	0	0

LEYTON.*For Constructing 9-Inch, 12-Inch and 15-Inch Pipe Sewers, with Manholes, &c., in Markhouse and Lea Bridge Roads, for the Leyton Urban District Council. Mr. WILLIAM DAWSON, A.M.I.C.E., Engineer.*

T. Adams	£1,292	16	0
Killingback & Co.	1,254	0	0
W. Wadey & Co.	1,178	18	0
G. Wilson	900	10	6
J. Jackson	888	0	0
Engineer's estimate	1,095	0	0

LONDON.*For New Workshops at the Brewery, Stratford, E., for Messrs. Savill Bros., Limited. Mr. FRED. A. ASHTON, Architect, 3 Crooked Lane, E.C.*

J. & H. Cocks	£558	0	0
HEARLE & FARROW (accepted)	545	0	0

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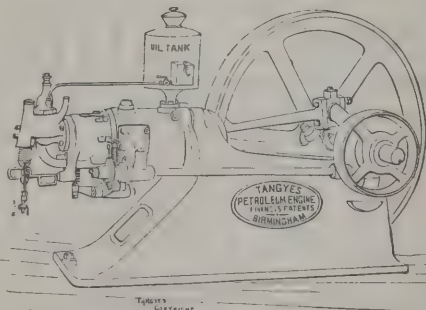


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Charteris	£1,284	0	0
Colls & Sons	1,157	0	0
Worsley & Co.	1,147	0	0
Simpson & Son.	1,144	0	0
Killby & Gayford	1,087	0	0
W. CUBITT & CO. (accepted)*	1,019	0	0

* Exclusive of Wall Tiling, 186*l.*, and Ventilation, 70*l.*

For Rebuilding and Fitting-up the Earl of Derby Public-house, Station Road, Forest Gate, E., for Mr. Alderman Fielder. Mr. FRED. A. ASHTON, Architect, 3 Crooked Lane, E.C.

	Building.	Fittings.	Total.
H. Wall & Co.	£2,609	£589	£3,198
A. Reed & Son	2,398	650	3,048
W. Shurmur	2,352	615	2,967
Hearle & Farrow	2,239	610	2,949
W. Watson	2,360	568	2,928
J. & H. Cocks	2,298	595	2,893
W. J. MADDISON (accepted)	2,279	583	2,783

For Alterations and Additions to the Victoria Tavern Public-house, Burdett Road, Mile End, E., for Messrs. Holt & Co. Mr. FRED. A. ASHTON, Architect, 3 Crooked Lane, E.C.

Hearle & Farrow	£2,855	0	0
W. Watson	2,658	0	0
H. Wall & Co.	2,655	0	0
W. Shurmur	2,639	0	0
J. & H. Cocks	2,598	0	0
C. North	2,293	0	0
C. Holland	2,279	0	0

For Alterations and Additions to the British Lion Public House, West Ham Lane, Stratford, E., for Mr. W. Foulger. Mr. FRED. A. ASHTON, Architect, 3 Crooked Lane, E.C.

A. Reed & Son.	£1,498	0	0
H. Wall & Co.	1,475	0	0
W. Shurmur	1,462	0	0
Hearle & Farrow	1,447	0	0
W. Watson	1,425	0	0
J. & H. Cocks	1,394	0	0

POTTER'S BAR.

For Additions to Schools, Little Heath, Potter's Bar, Herts, for the Building Committee. Mr. J. R. MANNING, M.S.A., Architect, Milkwood Estate Office, Herne Hill, S.E. Quantities by the Architect.

Holliday & Greenwood, Loughborough Park Works, Brixton, S.W.	£497	0	0
J. Hunt, Hoddesdon, Herts	475	0	0
Willmott & Son, Hitchin, Herts	430	0	0
J. Warboys, Potter's Bar, Herts	425	0	0
W. Groom, Hatfield, Herts	400	0	0

ST. MARY'S CRAY.

For Restoration of Side Windows, &c., of St. Mary's Parish Church, St. Mary's Cray, Kent. Mr. ARTHUR VERNON, Architect, 29 Cockspur Street, London.

Samuel Page	£239	0	0
Thomas Knight	235	0	0
Robert A. Lowe	229	0	0
JOSEPH POTTER (accepted)	200	0	0

TUNSTALL.

For Extension to Victoria Institute, for Tunstall Urban District Council. Messrs. WOOD & HUTCHINGS, Architects. Tunstall and Burslem.

Cartledge, Tunstall	£2,520	0	0
York & Goodwin, Tunstall	2,250	0	0
Smith, Tunstall.	2,194	0	0
Cope, Tunstall	2,148	0	0
Godwin, Hanley	2,119	0	0
BRAYFORD (accepted)	2,051	0	0

WREXHAM.

For Additions to Board Schools, Pentre, Wrexham. Mr. J. E. LASH, Architect, Wrexham. Quantities by the Architect.

Turner Bros., Wrexham	£1,216	11	3
W. E. Samuel, Wrexham	1,130	0	0
T. Williams, Wrexham	1,089	0	0
S. Moss, Coedporth	1,079	0	0
E. Probert, Hope	1,033	5	0
Harrison & Griffiths, Coedporth	945	0	0
P. Jones, Broughton	936	0	0
WILLIAMS & WYCHERLEY, Ffrwd, Wrexham (accepted)	930	0	0

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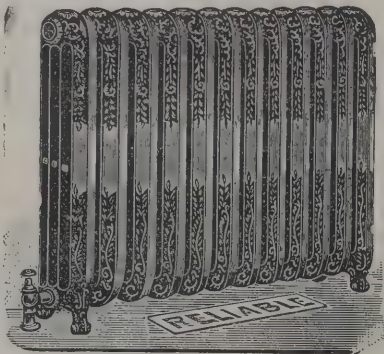
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TRADE NOTES.

THE efficient and economical lighting of barracks and officers' quarters is a question of pressing necessity in places remote from gasworks or electric light stations. In many cases lamps are used, and prove a constant source of trouble and anxiety as to possible explosions with disastrous fires to follow. We have had brought to our notice an excellent, perfectly automatic gas-making machine for buildings and places having no gasworks. It is called Müller's Alpha Patent, and is an improved form of the machine made by Messrs. Müller & Atkins, 22 Mary Ann Street, Birmingham. It has been before the public for many years, and seen the rise and fall of several competitors. Many thousands are now in use for lighting every description of building in this country, the Colonies, India, &c. The gas produced is a pure article. Unlike coal gas, it does not give off sulphurous fumes, and will not injure delicate decorations or destroy plants and pictures. It is useful for lighting, cooking, heating and power, just as coal gas is. The apparatus requires no skilled labour, is complete in itself, has no unsightly chimney, requires no fire, makes no ashes or smoke, and causes no dirt. It is equally suitable for a mansion, officers' quarters, barrack rooms, or small private dwellings, the burners and other fittings being as cheap, or as luxuriously designed, as may be desired. The whole machine is easily packed for export. It proves a boon wherever introduced, and is economical in use.

We are informed that the Edison and Swan Company are about to ascertain in a court of law whether they can enforce satisfactorily the following clause in the agreement under which they allow licensees to work certain of their patents:—"The licensee shall not make or allow any discount, commission, return, gift or allowance to customers greater than the discount from time to time allowed by the company." It is alleged that this clause has been disregarded, especially as concerns lamp-holders, by certain licensees, to the detriment of others, and the proceedings referred to have been instituted chiefly for the protection of the latter. It is an evidence of the close competition between electrical engineers and manufacturers that such a course as this has been considered necessary.

MESSRS. RUTTY write us as follows:—"We have the pleasure of informing you that we are carrying on business as paviors, masons and general contractors, of which trades our late father, Geo. G. Rutty, had been for over forty years honourably connected, with whom for many years we have personally co-operated. We have invented a "New Macadam

Road Scarifier," which will enable us to perform with greater expedition such contracts necessitating its use; and further point out that our invention contains many improvements on the original pattern, and much superior to any machine now in use. We are prepared to undertake contracts for steam-rolling, hauling boilers and heavy weights, of which we have personally made a speciality for many years past. At our shoot at Hackney Wick we are able to receive any quantity of excavated material.

AN excellent result followed the trial just made at Bromley of a newly-invented road scarifier, which, judging by the results, bids fair to eclipse any of these machines that are now in use. The "Duplex" scarifier (as it is called) is very simple, and weighs considerably less than any of its predecessors, while the cost is little more than half. It is worked by any ordinary 8 or 10 ton steam roller, and one of the advantages is that the roller can push the machine as easily as drawing it, and this without detaching. The teeth (or tines) are arranged in a very ingenious manner, by which the crown of the road is broken up with a minimum expenditure of power. The inventors are Messrs. A. & H. Rutty (sons of the late well-known contractor of that name), who are carrying on business at Bromley-by-Bow. Having had exceptional opportunities of the practical working of road scarifiers since they were first introduced, the inventors have embodied in this machine the maximum of simplicity and all the latest improvements.

MESSRS. PECKETT & SONS, of the Atlas Engine Works, Bristol, have just issued a copy of their new illustrated lists of tank locomotive engines they have in stock ready for immediate delivery. The locomotives described are all of their latest designs, well proportioned, and equally balanced. The principles of motive power are correctly applied, the construction is as simple as possible, and there are no intricate working parts to get out of order. They are built of the very best material by the best workmen. Every engine passes the most rigid inspection on completion, and they are thoroughly tested on rails before leaving the works, and no engine is sent out unless fully up to the standard.

MESSRS. WILLIAM FISHER & SON, of 53 Paradise Street, have just been appointed makers to the Birmingham School Board for three years, and are now furnishing latest new schools for Wolverhampton and Handsworth (Staffs) School Boards, each school for over 1,000 children, the furniture being all of oak.

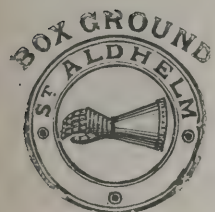
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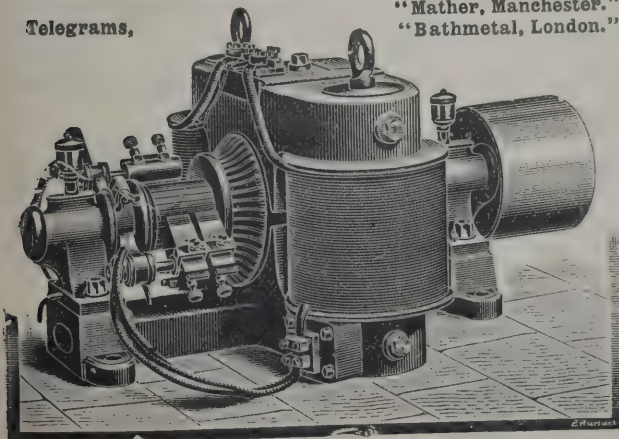
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VARIETIES.

THE construction of two new service reservoirs in connection with the Leeds water supply is proposed. The cost of the land is expected to amount to about 3,600*l*.

It is proposed to lay out 3,850*l*. on improving the water supply of Masham.

THE Dunoon Police Commissioners have concluded an arrangement with the Hafton trustees whereby they acquire the pier, pier-master's house, skating-rink, restaurant, stables and the ground between the pier and the Barren Rocks for 27,000*l*.

THE *Glasgow Herald* says in regard of the Deer Forest Commission, "We understand that the plans and specifications for alterations and improvements (to the extent of 5,000*l*.) to have been carried out on the estate of Glencastley, Sutherland-shire, by the proprietor, Mr. W. E. Gilmour, Woodbank, Dumbartonshire, have now been entirely withdrawn. The architects employed were Messrs. Alexander Maitland & Sons, Tain, Ross-shire, and John Burnet, Son & Campbell, Glasgow. This step has been taken by Mr. Gilmour on account of this Commission having scheduled two-thirds of the best land on the estate for small holders, thereby breaking up his large sheep farm, of which he is sole tenant.

THE new bridge over the Clyde joining Glasgow to Rutherglen was inaugurated on Wednesday by the laying of the memorial-stone. The new bridge, which replaces an older structure erected as far back as 1775, is a handsome granite bridge of three arches, the centre one of which has a span of 100 feet, each side arch having a span of 90 feet.

AT the Coatbridge Dean of Guild Court plans have been passed for the erection of new properties, the estimated value of which is upwards of 10,000*l*.

PLANS are to be prepared for the extension of the Henley Board Schools.

THE *Leeds Mercury* says:—The remarkable effects of the severe frost of last winter are set forth in the report just prepared by the water committee of the Sheffield Corporation. It states that 20,000 houses were deprived of water, that the number of streets affected was 212, the number of metal service-pipes fractured 8,614, and that cast-iron pipes repaired or relaid amount to an aggregate length of 14½ miles. The cost of affording temporary supplies and the special repairs was up to March 1, 1894, and a further expenditure of 7,317*l*. was incurred between that month and May 25. The work of relaying and lowering pipes is still being carried on, and even at the present time 170 additional men are employed remedying the defects caused by the frost, and involving further charges on the current year's revenue. In the middle of May no less than 535 pipe layers were at work, and many thousands of lead communication pipes burst between the mains and the houses.

The other day a party of members of the Society of Engineers were able to visit the works of the Waterloo and City Railway which is to be worked by electricity. When opened it will enable passengers to get from Waterloo to a point near the Mansion House without stoppages in about four minutes. The departure platform of the Electric Railway at Waterloo will be about 36 feet below the South-Western platforms, while in the City the depth below the surface will be 65 feet. At the latter place lifts will be required, but at Waterloo it is proposed to have easy inclines, with a few stairs at intervals. The line commences at Waterloo at right angles to the existing lines, passes under Stamford Street until Hatfield Street is reached, where it bends to the left, and passing under some property at a depth of 56 feet reaches the Surrey side of the river at a point some 500 feet on the up-stream side of Blackfriars Bridge. The river is crossed obliquely, the centre line on the Middlesex side being about 120 feet on the up-stream side of Blackfriars Bridge. From this point the railway bends to the right, and then passes along the centre of Queen Victoria Street to its terminus in the City, opposite the Mansion House. The total length of the line will be, in round figures, 1½ mile.



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THE contract for reseating the Leeds Town Hall has been given to Mr. James Jackson, of St. Ann Street, Leeds.

THE Leeds Town Council have decided that the police-station at Wortley must be rebuilt.

ELECTRICAL.

THE *Leeds Mercury* says:—The Yorkshire House-to-House Electricity Company, Limited, are about to further reduce their price for electricity. The new scale of charges comes into operation on July 1, when the maximum gross price will be 6d. per unit. This is reduced to 5½d. per unit in the case of consumers of not less than 1,500 units per quarter, and to 5¼d. per unit when the consumption for the quarter exceeds 3,000 units. A scale of discounts is also announced, the benefits of which are available equally to the smallest and largest consumers, the discounts being calculated upon the consumption per lamp. A consumer using his lamps not less than 300 hours in the quarter is entitled to a discount of 5 per cent., and for a greater number of hours' use the discount increases up to a maximum of 15 per cent. An additional discount of 5 per cent. is allowed in all cases for prompt payment. Under the new scale the minimum net price is slightly under 4½d. per unit, whilst the greatest price payable by any consumer is just under 5¾d. per unit. Leeds will thus have the benefit of one of the cheapest supplies of electric light in the country. For heating, cooking, and motive power the company are supplying current at 3d. per unit. The use of electricity for these purposes is steadily extending. The number of lamps now connected to the mains is about 28,000, compared with 11,500 a year ago.

THE recommendation of the committee has been adopted by the Edinburgh Town Council, to make an extension of the high-tension electric mains at an estimated cost of 5,000l.

DUNDEE INSTITUTE OF ARCHITECTURE.

THE annual excursion of the members of the Dundee Institute of Architecture, Science and Art took place on Saturday—Colliston Castle, Letham Grange and St. Vigeans Church being the places chosen for visitation. The party, numbering about thirty, and including several ladies, left the East Station, Dundee, at 12.30 P.M. On arriving at Arbroath they were

joined by Mr. A. A. Symon, architect, Arbroath, who acted as guide for the rest of the day. Leaving Arbroath at 1.30, the excursionists arrived at Colliston Station a quarter of an hour later and walked to Colliston Castle.

At the castle they were met and cordially welcomed by Mr. and Mrs. Peebles Chaplin. The recent alterations and improvements on the building were explained at length by Mr. Chaplin, who also gave a lucid and most interesting account of the history of the castle. In this connection he took occasion to correct an error made by Messrs. M'Gibbon and Ross in their work on the castellated and domestic architecture of Scotland, who give the date of the castle as 1553, and thus held that it could not, as tradition asserts, have been built by Cardinal Beaton. Mr. Chaplin quoted from an ancient Latin charter signed by the monks of Arbroath Abbey, showing that "the principal mansion-house of Colyston" was in existence in 1545. The attention of the visitors was specially directed to several ancient stones now built into the walls of the castle, these having been recently recovered by Mr. Chaplin during building operations. It is conjectured that the stones had at one time been taken from an ancient religious temple, which is known to have existed in very early times in the vicinity of Colliston. Other interesting features were pointed out, and the party were subsequently shown over the interior of the mansion. Great admiration was expressed at the fine artistic taste shown in the fitting-up and furnishing of the various principal apartments. The excursionists then walked to Letham Grange House, permission to visit which had been given by Mr. Fitzroy C. Fletcher, the proprietor. The charming situation of the mansion was noted, and the architectural features of this fine building were greatly admired. Subsequently the visitors were, by the kindness of Mr. Fletcher, permitted to inspect the interior of the house. The many and costly articles of *vertu* within the walls were shown the visitors, special notice being taken of Pettie's famous picture, *The Chieftain's Candlesticks*, an example of Turner, and Colin Hunter's well-known *Fisher Girl*. The visitors were particularly struck with the elaborate arrangements made for lighting the house by means of the electric light, with the fine music provided by a military band organ on the principal staircase, and with the luxuriant vegetation in the conservatories. The visitors were subsequently shown over the stables and riding school by Mr. Letts, and next paid a visit to the extensive greenhouses, over which they were shown by Mr. Duncan, head gardener. Returning by train to Arbroath, the excursionists

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partook of tea in the White Hart Hotel, after which they drove to St. Vigeans Church. Here they were met by the Rev. Dr. Duke, and conducted over the building. The famous Drosten Cross (one of the stones scheduled for preservation by Act of Parliament) and the various other ancient sculptured stones were inspected with peculiar interest, Dr. Duke's exposition of the historical antecedents of the stones and of the church being much appreciated. Having been shown over the beautiful grounds attached to the manse, the party were invited inside to partake of refreshments. Dr. Duke expressed the pleasure it always afforded him to welcome parties interested in St. Vigeans and its church, one of the oldest religious settlements in Scotland. The party then drove back to Arbroath, and returned to Dundee in the evening. The excursion, arrangements for which were made by Mr. J. J. Henderson, secretary of the institute, was of a most successful and enjoyable nature.

HULL LIBRARY.

THE Northern Branch Public Library was opened on the 13th inst. by Sir James Reckitt, Bart., deputy chairman of the Hull Public Libraries Committee. It is situated on the Beverley Road, at the corner of St. Hilda Street, with a frontage in both thoroughfares. The building is faced with red pressed bricks, relieved with Ancaster stone dressings. The roof is broken by turrets and gables. It is covered with green slates, the gables with moulded stone water-tabling, finishing at the top with carved open stones. The arches have their tympana filled with stone carving. In the large windows of the reading-room two dragons are upholding a shield, with the Hull coat-of-arms in bold relief. The window over the porch door is filled with foliage, with a shield in the centre. At each side of the porch door are heads, designed to represent knowledge and strength—"Knowledge is power." The tower in the centre forms the roof of the staircase, and is surrounded by a battlement, with carved gargoyles.

The entrance is in the centre of the Beverley Road front through a gabled porch and two swing-doors filled with stained glass. These open into the front hall (25 feet by 10 feet) with a marble mosaic floor, and facing the visitor is the counter space for the lending library, extending over the full length of the hall. Overhead is a panelled ceiling, the central feature here again being a shield in plaster cast work. The hall is well

lighted, and those borrowers having to use the indicators will find abundant light night or day. To the left, immediately adjoining, is the reading-room (32 feet wide and 42 feet 6 inches long) with curved ceiling panelled to half the height of the roof, on the hammer-beam principle. This room is lighted by four large windows, the upper lights of each being filled with stained glass in lead lights. The room is heated by radiators on the low-pressure system, which is carried throughout the entire building. The fittings of the reading-room are of walnut, and embrace the reading-desks, which stand across each end, whilst space is afforded for sixteen reading tables. Opening from a door to the right is the lending library (24 feet by 33 feet), where ample room for book storage is to be found. This room is lighted from the roof, and commands a full view of reading-room, windows connecting both rooms. The fittings are of walnut, with accommodation for over 10,000 books, which at any future date can be extended. The library contains about 8,500 volumes. To the right of the entrance hall is the back hall, leading to the officials' rooms and the staircase, which leads to the committee-room, &c. The committee-room extends over the entire hall, and has a curved and panelled ceiling. The work has been carried out by the architect, Mr. Henry Cheers, Twickenham; the builders are Messrs. Bowman & Sons; the painter, Mr. W. Beautiment; the plumber, Mr. W. Finch; the hot-water engineer, Mr. Holdroyd, Leeds; the internal fittings are by Mr. Lacenby, from plans by the Corporation architect; and the incandescent light by Messrs. Hare & Co. The total cost is slightly under the estimate of 2,000l.

RAILWAY RELICS.

IN searching for particulars for his "History of the London and South-Western Railway," Mr. G. A. Sekon (the author of "A History of the Great Western Railway," and other books on railway subjects) has come across some of the very first specimens of vehicles constructed to run on railways, viz.:—two open passenger carriages, each about 9 feet long and 6 feet wide, running on four cast-iron wheels; each carriage weighs about two tons. Besides the carriages there is a goods' wagon of an equally primitive type. The vehicles were built in 1834 by the Bodmin and Wadebridge Railway Company, which line, "in spite of all temptations to become broad gauge," refused, and for sixty years remained the narrow-gauge sentinel in Cornwall of the L. & S. W. R.

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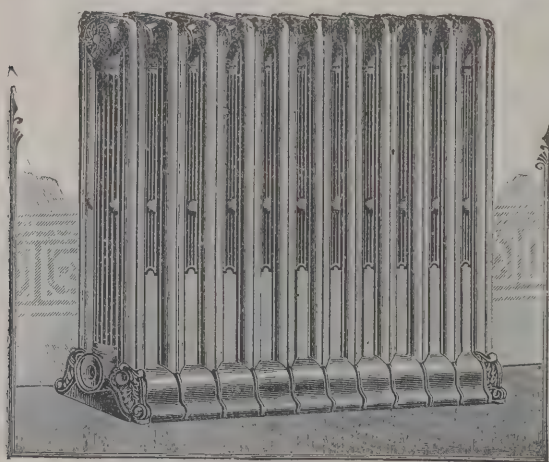
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On June 1, 1895, the L. & S. W. R. Company completed their narrow-gauge North Cornwall line to Wadebridge, and so became physically connected with their ancient Cornish possession, the Bodmin and Wadebridge Railway.

These old specimens of rolling-stock had long since been disused and thrown on one side, although fifty years back they used to run on Mondays, Tuesdays, Wednesdays and Fridays from Wadebridge to Bodmin, returning on Thursdays and Saturdays. These interesting types of old railway vehicles have been cautiously removed to the Eastleigh Carriage Works, where they will be carefully preserved until such time as England possesses a National Railway Museum in which can be deposited the valuable relics of early railway machinery, instead of being kept as at present hidden away in the works of the various railway companies, and therefore inaccessible to the ordinary student of railway progress.

Such a museum Mr. Sekon hopes will some day be established as a national monument to the skill and talent of those illustrious Englishmen who invented railways, which have done more than anything else to develop and civilise the world.

BUILDERS AND BOUNDARY WALLS.

In the Torquay County Court Mr. Edmund Pike, builder, brought an action against Mr. William Brendon, another builder, to recover 10*l.* for damage alleged to have been done to plaintiff's boundary wall by defendant's excavations. At Ellacombe plaintiff built a couple of houses with an ordinary 4-feet 6-inch boundary wall, the foundations of which were about 15 inches deep. Defendant subsequently took a plot of ground adjoining, and in excavating undermined plaintiff's boundary wall in some places, so much so that a portion of the wall fell. Mr. E. Pike said the cost of rebuilding the wall was 8*l.* 1*s.*, and other damages brought the total claim to 10*l.* The wall was built in 1888, and was solidly constructed.

Mr. J. Mountstephen said the wall fell because the ground was excavated. The wall was well built.

The Judge said the depth of the foundations depended on the soil.

Mr. Mountstephen: You are quite right, your lordship.

His Honour: You see Mr. Mountstephen confirms me.

Mr. William Tucker, who built the wall, said the foundations were well laid, about 15 inches deep. He also assisted in rebuilding the wall.

Mr. J. Pike gave similar evidence.

Mr. Eastley held that all he (defendant) was called on to do was to leave a sufficient foundation to keep the wall up, and he should prove that there was sufficient foundation and a good resistance bank of the best material. There need have been no resistance bank if the wall had been properly built. He maintained that it was owing to bad construction that the wall fell.

Mr. Brendon said that some of the mortar used in the construction of the wall was made of mud. The wall was not tied as it should have been. He estimated that the cost of rebuilding the wall was 6*l.*

Cross-examined: The wall stood for seven years before it fell. The wind had something to do with its fall.

Mr. Goss, a surveyor, agreed.

Mr. Yeo, builder, said he examined the wall for defendant. He did not know why the wall fell, and declined to have anything to do with the case.

Mr. Richards, Manor Office architect, said there was not sufficient foundation to the wall. It would have fallen in any case. Mr. Pike acknowledged that he (the architect) had often complained of his work.

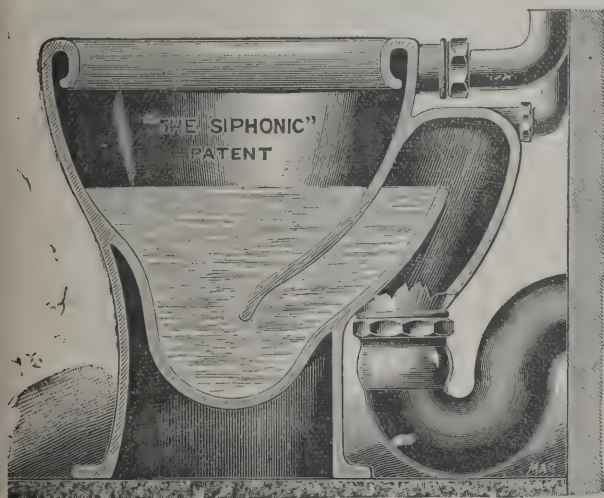
Mr. Pike: I don't acknowledge it.

A mason in Brendon's employment supported defendant's case.

His Honour, giving judgment, did not think the wall went down to the shale, or that its fall was caused by defendant. Verdict for defendant with costs.

ELECTRICITY AND GAS.

At the meeting of the Incorporated Gas Institute in Edinburgh a paper by Mr. F. H. Medhurst, on the subject of "Electricity Supply from Town Gas," was read. He submitted for the consideration of the institute a few important questions in connection with the supply of electricity from central generating stations for public and private purposes. It would probably be freely admitted by every member of the society that the electric light had come to stay, and that in every town of even average importance there was a fair and increasing number of persons desirous of having their business or private premises electrically illuminated, even though the cost in the great majority of cases were greater, light for light and time for time, of the electric than the gas light. It was no longer necessary



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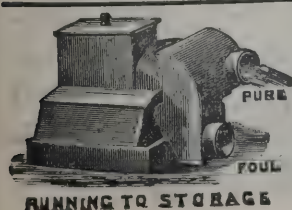
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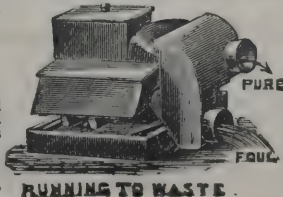
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to urge the numerous and unique advantages of electric light, because they were now almost as freely recognised by gas engineers as by electricians. There could be little or no doubt that the number of electricity supply works in existence and in immediate contemplation would be greater than was actually the case but for the strenuous opposition which the electric lighting industry had from the commencement sustained from almost all those interested in the maintenance and development of the gas industry. But he thought that a very little calm consideration must show that to maintain that because hitherto the consumption of gas has not been seriously affected by the use of electricity, therefore it never would be prejudicially affected, was to display ignorance or disingenuousness. Electrical engineers recognised that the cheapening of the electric current produced at central stations depended, in a very great measure, on the extent to which electricity came to be used during the daytime, and generally during the time when the generating plant was not required for lighting purposes, and it was certain that if the plant at generating stations could be worked at full load, and without the intervention of electric accumulators, for twenty hours out of the twenty-four, then the electricity produced could be very profitably sold for considerably less than 3d. per unit. But if this thing came to pass—as, rightly or wrongly, he was convinced it would—what would be the effect on the gas undertakings? If the electricity were produced—as was now usually the case—through the intervention of steam-boilers and steam-engines, then he made bold to say the result would be to very seriously cripple at least a great number of the gas undertakings in this country. With the single exception of the Corporation of Belfast, no local authority appeared to have recognised that there was no great advantage to be derived from founding one kind of lucrative business if that business was to proportionately reduce the profits of an existing and a paying undertaking already in the possession of the ratepayers. In his opinion, there was one way, and one way only, whereby electricity supply works could be so carried on as to permanently benefit, from a commercial standpoint, the gas undertaking. Obviously this was a consummation devoutly to be desired—at least in those cases where the gas and electricity supply businesses were in the possession of the local authority, or where (if there were such an example) both belonged to the same company. In his opinion, the problem was only to be solved on a permanent and sound financial basis by the employment of gas-engines, actuated by town gas, to drive the dynamos. If the two under-

takings were worked so as to be interdependent, they must necessarily exercise a beneficial influence on each other's paying capacities. An increase in the demand for electricity would necessitate the manufacture of a proportionately greater quantity of gas. There would be a series of actions and reactions; and there would be no rivalry between the businesses of gas and electricity supply, because there would be no clashing of interests.

Mr. Ellery remarked that the suggestion of using gas for producing electricity was actually an accomplished fact, although not in the way Mr. Medhurst had suggested; and it was important for them to keep before them whether the arrangement was to be conducted by gas-driven engines at central stations or by the same process on the premises illuminated.

Mr. West ridiculed the idea of the electric light ever being supplied at the cost suggested by Mr. Medhurst. He argued in favour of the gaslight as against the electric light, and said he thought they had shown that, instead of the electric light injuriously affecting them, they were still making the distance greater between the two.

Alderman Myles observed that no doubt electricity had come to stay, but he was not afraid that the supply of electricity, given either by private companies or public corporations, would in the long run materially affect the supply of gas.

Mr. Carr said he thought they must agree that not only had the electric light come to stay, but that it must be accorded the first place in point of quality as an illuminant. At the same time he contended that gas was as capable of development as electricity, and that the latter would not reduce the consumption of gas any more than gas had been successful in reducing the consumption of candles and oil.

THE BALTIC SEA CANAL.

THE special correspondent of the *Standard* in the course of an article on the new canal says:—

The canal is 98·65 kilometres long. It starts at Brunsbüttel on the lower Elbe, intersects a lake called the Kuden-See, follows the course of the rivulet Holsten-Au past Burg to Grünthal, 30 kilometres from Brunsbüttel, where it is spanned by a high-level bridge for the Neumünster-Heide Railway and a high road. As far as Rendsburg it traverses a monotonous

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and swampy country, dotted with melancholy fir woods at rare intervals. Beyond Rendsburg it passes into the Eider, and the scenery becomes more picturesque. Passing through the Andorf Lake, the Borgstedt Defile, and the Schirnau Lake, it passes Levensau, where there is a second high-level bridge, and enters the Baltic at Holtenau, on the western shore of Kiel Harbour. The main channel is 9 mètres deep and 22 broad. The total width of the canal is fully 60 mètres. Steamers can use their own steam, but sailing ships must be towed, twelve steam tugs being provided. The canal is wide enough for two ships to pass at all points of its course; not only two of the largest merchant steamers, but even a large warship and a merchant steamer can pass each other without danger of collision. There are also six special sidings, as in the Suez Canal, so that even the largest ironclads can pass each other. All possible care has been taken to minimise the number of curves, and to make the radii as wide as possible.

Four railways cross the canal, two by swing bridges and two on high-level bridges. They do not obstruct navigation in the least, for they leave the whole breadth of the canal free, and there is a clear space of 42 mètres between them and the water. At night the canal is lighted by electric lamps, placed at intervals of 150 mètres, and at still shorter intervals at the curves. In the lakes gas buoys are laid. The double locks at Holtenau and Brunsbüttel are of great size. Their available length between the gates is 150 mètres, their width 25, and their depth 9.8. The largest German ironclads are 112 mètres long and 19½ wide, and have a draught of 8½ mètres. Except the new lock at Bromerhaven, these are by far the largest locks in the world. The gates are moved by hydraulic power. The Brunsbüttel lock remains closed during the flow of the tide, and is opened only when the water is at the same level on both sides of it. The entrance is on the right; the exit on the left. The Holtenau lock is always open except in stormy weather.

The cutting of the canal was, on the whole, not very difficult. Except in short stretches of moor, especially in the middle, the soil that had to be taken out generally consisted of sand and clay, and at times the task was a toilsome one, owing to the slips of sand and clay that followed the operation, and the occasionally copious flow from underground watercourses. Save for a number of irregularly scattered blocks of granite, the getting out and blasting of which was a very laborious business, no solid rock was found. The hopes of geologists that the cutting would give them an accurate knowledge of the

primeval mountains of Schleswig-Holstein, or enable them to make other important observations, have consequently been almost wholly disappointed. But there were some exceptions. In the moors of Grünthal and Beldorf interesting fossils of plants of the diluvial period were found, and the views expressed by Haas many years ago regarding the importance of the second glacial period in the formation of Schleswig-Holstein have been completely confirmed. The almost total absence of rock enabled the engineers to make the most extensive use of machinery. Seventy dredgers, ninety locomotives, fifty-nine steam-engines, 133 steam-tugs and 2,473 transport-wagons were at the disposal of the building committee, which consisted of about 300 members. The maximum number of labourers employed at one time was 9,000, but, on the average, about 6,000 were employed in summer and 3,000 in winter. For their accommodation the Imperial Canal Commission built a number of barracks, which proved admirably well suited for the purpose. The dormitories, each intended for eight men, were 9 mètres broad, 4 long, and 4 high. They contained for each man an iron bedstead, a seaweed mattress, wedge-shaped bolster, sheets, one blanket in summer and two in winter, a towel, a locker, and a stool. Each workman had to pay 60 pfennigs (7d.) a day for coffee in the morning, dinner, washing, lodging, light, and fuel. Dinner consisted of about two litres of strong nourishing food. Breakfast and supper the men could buy at the canteen; the prices fixed by the Canal Commission were extremely low, and were posted up at suitable places in the barracks. The average working time was ten hours a day. Wages were paid fortnightly, and, to prevent the development of the truck system, the payment of wages by middlemen was strictly forbidden. The average wage was 3½ marks (3s. 6d.) a day, but some skilled labourers earned considerably more.

The first impression of the canal at Brunsbüttel is rather disappointing, since at that spot its great breadth is not fully appreciated. Brunsbüttel, the home of the pirates of the thirteenth and fourteenth centuries who harried the Hamburg traders, is now, after a sleep of five hundred years, once more awakened to life, to become the western terminus of the canal, though in reality it lies some distance to the north of the actual mouth. It will, however, soon be connected with Brunsbüttel-hafen by rows of streets, and with the real mouth "Kaiserhafen," where it is proposed to build an entirely new town of 10,000 inhabitants. On closer examination it is impossible not to be impressed by the two enormous locks (one for incoming



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and one for outgoing vessels) forming one end of the outer basin, with their granite piers looking as if they were constructed to last for ever, and by the wide outer basin, with its two great lighthouses, the lights of which (the western red, the eastern green) are about 53 feet above the level of the water. In order to prevent incoming vessels colliding with the piers, the axis of the outer basin is placed at an angle of 45 degrees, so that a ship can enter it almost straight either with or against the current. The western mole is 267 mètres, the eastern 131½ long; yet, according to seamen, the latter is still too short. In front of the moles is a roadstead 1,500 mètres wide, and about 12 mètres deep, distant 16 knots from Cuxhaven, 12 from Glückstadt, 40 from Hamburg, and 27 from Brunshausen, on the opposite back of the Elbe, near Stade. The outer basin is 100 mètres wide, and is enclosed by a stone wall protected against the impact of ships by great bollards, and standing 3·23 mètres above the normal water level. The western side of the basin is 450 mètres long; the eastern side 340, of which 350 and 240 mètres respectively will be utilised for fastening up ships. There is also here a small basin for pilot boats and pilot steamers. The outer basin is intended simply to be a place of waiting for vessels wishing to pass through the locks. The depth at average low water is from 11 to 13 mètres. It is, therefore, navigable for the largest ironclads at low tide; and, what is of particular importance, has remained unchanged for more than a century. The canal at the mean water level has a depth of 9 mètres, and about half a metre more or less at flood or ebb tide.

From Rendsburg to Holtenau the canal bed is level; from Rendsburg to Brunsbüttel it falls with a slight gradient. The breadth at mean water level is 67 mètres. The course for 63 per cent. of the total length of 98·6 kilomètres is straight, while the sharpest curves have a radius of 1,000 mètres; they occur at Levensau, and constitute 3·3 per cent. of the total length. The height of the water in the locks in the Elbe and in the canal is shown by an automatic gauge set up on the land to the westward of the locks in a tower 16 mètres high. The indicating plates are lighted at night by electricity. An alarm-bell announces the setting-in of ebb or flood, the closing of the gates and the moment when the outer and inner waters are at the same level. The inner basin at the northern end of the locks serves as an anchorage and unloading place. It is more than 500 mètres long and 200 wide, and, therefore, considerably larger than the outer basin. A quay-wall, strongly built of stone, rising 1½ metre above the normal water level, surrounds it.

It is protected by bollards rising to the height of 7½ mètres above the water level, and by floating rafts. On the east side landing stages have been constructed, and on the west side there is a basin for the boats belonging to the Canal Administration and to the canal pilots. Near the locks for incoming vessels on the outer basin are the offices of the harbour officer, protected from the water by yet another embankment. On the west side of the locks is the building to be used by the Elbe pilots, with sixty beds, and close to it the Custom House. On the east side of the inner basin are the boiler-houses and engine-houses, which supply the power for working the sluices. The arrangement is exactly the same as at Holtenau. The water for feeding the boilers comes from the Kuden-See, distant about six kilomètres. The Brunsbüttel basin is connected by a railway 6·8 kilomètres long with the St. Margarethen station of the Marsch-Bahn, running from Elmshorn to the Danish frontier. The traffic along the high road from Itzehoe to Brunsbüttel, which has been interrupted by the canal, is now taken over by a ferry at the end of the inner basin. As on all ferry-boats, no fare is charged, as the Government has undertaken to work it at its own cost.

EDINBURGH WATER SUPPLY.

THE *Scotsman* gives a report of the meeting of the Edinburgh and District Water Trust, Lord Provost McDonald presiding. The minutes of the works committee of June 7 contained a report by the engineer stating that the two additional filters at Alnwickhill, equal to one-third of the area of the present six filters, would cost 9,400*l.*, and that a new pure water tank with a capacity of five and a half million gallons would cost 23,600*l.* The same committee also recommended extension of the piping from the new 12-inch Moorfoot pipe in Morningside Road for carrying the Moorfoot water into the district between Morningside and Colinton Road, at a cost of 1,128*l.* or thereby. Bailie Archibald, in moving the approval of the minutes, said that the trustees were now entering upon a new position. They had received the royal assent to their Bill for bringing in an additional supply of water to the town. That would take six or seven years in ordinary course, and in regard to the existing supply it would be their duty to utilise that supply to the very best advantage until they got the new one. For a long time there were numerous complaints of want of water in the High Street in the high tenements, and in order to provide a

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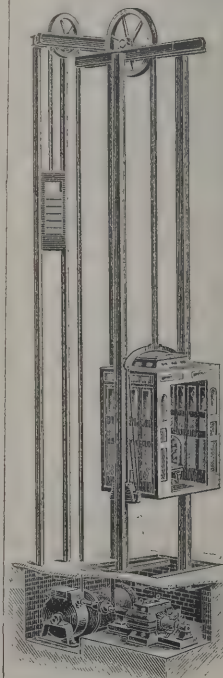
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better supply the trustees last year ordered a new main of 24 inches to be laid from Alnwickhill to Hope Park, and a 16-inch main from there to the Tron Church. The result of the laying of these mains had not been fully demonstrated as yet, because the junction had not been made at the Tron Church. But a junction had been made at Hope Park, which already had had a beneficial effect. In the High Street the ordinary pressure at twelve o'clock opposite the Royal Exchange seldom exceeded 30 feet. Now it was up to 60 feet, and the effect of that was that water was flowing into the cisterns on the fifth and sixth flats in the High Street at noon. When once they made the junction at the Tron Church they would be able to give even a better supply. As further proof of the benefits of this supply be mentioned that at the Royal Infirmary the former pressure previously was 40 feet at twelve o'clock, and now it was 80 feet. In regard to the present water supply, there was no need for anxiety and alarm though the season had been dry. They had yesterday 500 million gallons of water less in store than on the corresponding day of last year, but they had 190 millions more than they had on the same day in 1893. As far as they could judge, they would be able to stand a drought for three months without being seriously troubled for water. The proposals of the works committee submitted were in order to utilise to the utmost their available water supply. There was nothing so important as slow filtration for improving a water supply and making it safe for the community, and the system adopted at Alnwickhill was as good as could be found anywhere in the world. The minutes were adopted, and, on the recommendation of the committee, it was agreed to accept the estimate of Messrs. James Young & Sons of 23,394*l.* 2*s.* 10*d.* for the filters and tank.

PARIS TRAMWAYS.

A REPORT on the tramway system of Paris and the Department of the Seine has been prepared by Mr. Graham, third secretary of the British Embassy. It appears that tramways were introduced into France by M. Alphonse Loubat, on his return from a voyage in America, where he had first seen and appreciated this new method of locomotion. To this fact their original name of "Chemins de fer Américains" may be attributed. By virtue of a ministerial decision of August 16, 1853, a preliminary trial took place in Paris on the Quai

Debilly. It proved fairly successful and on February 18, 1854, an imperial decree authorised M. Loubat to establish and work, under certain prescribed regulations, horse-tramways running between Sèvres and Vincennes, with branch lines from the Rond Point de Boulogne. On September 15, 1856, by a second decree, this contract was transferred to the "Compagnie Générale des Omnibus," which had previously entered into a treaty with M. Loubat succeeding to his rights and obligations.

But while in most of the large towns of Europe and America rapid strides were daily made in the development of this new system of transport, its progress in Paris was comparatively slow. The Government refused to permit the circulation of tramways on the Quai des Tuileries, frequented by the Court carriages, or in the crowded and populous streets of the Faubourg St. Antoine, and the only lines actually opened to traffic were those running between the Place de la Concorde, Sèvres and the Rond Point de Boulogne. It was not until 1871 that the first Council General elected, struck by the inadequate means of transport in Paris, planned the construction of a network of tramway lines to connect the different communes of the Department of the Seine. On August 9, 1873, the establishment of this first network was decreed, and the lines composing it have been successively laid down and opened for traffic. Dating from this moment the development of Paris tramways has progressed with extraordinary rapidity. The Loubat concession provided for barely eighteen miles of line, five of which were not even constructed until a period of nearly twenty years had elapsed. In 1893 we find the urban and extra-mural system extending over some 230 miles, and serving to convey annually more than 158,000,000 passengers.

The town of Paris is not entitled to any portion of the receipts of tramway lines, but receives from them:—

1. A ground rent for offices, stations and shelters erected on the highway. 2. A tax of 30 cents (3*d.*) on each car starting from a terminus within Paris. The sum obtained by the town as rent for offices, &c., amounts to 117,500 frs. (4,700*l.*) annually. The State receives nothing from tramway enterprises which are even exempted from the 3 per cent. wheel tax levied on ordinary carriages.

A decree of August 6, 1881, lays down the special conditions tramway enterprises must satisfy in regard to their construction, the circulation of their carriages and their relations with other public services.

The plans of the undertaking must be approved by the Minister of Public Works, Council General or Municipal

HARDYS' PATENT

No. 15,811.

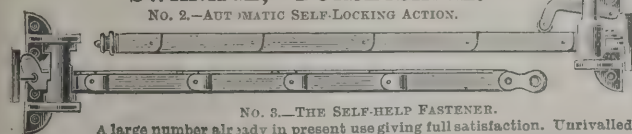
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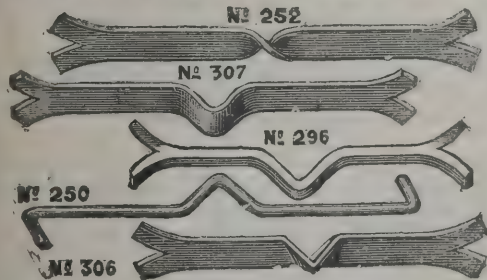
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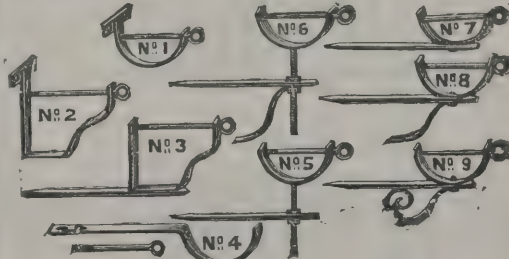
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Council, and, once approved, cannot be modified without their sanction. The administration, on the other hand, may call upon the concessionary to make such modifications as may be deemed necessary without thereby giving ground for an indemnity. The concessionary must, at his own expense, restore to their former condition roads on which his works have temporarily interrupted traffic. The number and position of stations, shelters and refuges are decided by the prefect. Expenses incurred in the purchase of land lying outside the roadway, or in damages or indemnities, must be met by the concessionary, but he is at the same time invested with all rights conferred on the administration, such as that of acquiring land by expropriation. Special regulations are applicable to lines running through fortified districts, or over mines or quarries.

The concessionary is answerable for the condition of the roadway over which his tramways pass. When a line is accessible to ordinary traffic (as is usually the case), the part of the necessary expenditure falling upon him is determined by the "cahier des charges." When closed to ordinary traffic he is responsible for the whole. In case of negligence on his part the prefect may proceed to repair the road at his (the concessionary's) expense. The maximum speed of steam tramways must not exceed 20 kiloms. ($12\frac{1}{2}$ miles) an hour. Reserve engines, provided with all necessary implements, must be kept stoked and in readiness to start immediately for the scene of an accident.

If the working of a line is interrupted or so badly managed as to endanger the public safety, the prefect may take measures to insure a provisional service at the concessionary's expense, and if, after three months, the latter cannot prove that he is in a position to resume and continue the working of the said line, it may be adjudicated to a new concessionary, who succeeds to his predecessor's rights and obligations.

The concessionary cannot oppose the construction of roads, railways, canals, &c., which cross his lines, nor can he claim an indemnity on their account. The concession may be withdrawn from him at any moment if, after an inquiry, such a step is considered to be for the public benefit.

The Government, department or commune are entitled to grant concessions of new tramway lines branching off from, or continuing those already conceded, without the original concessionary having any ground to claim an indemnity. The two concessionaries must in such case come to an agreement as regards the use of each other's lines, stations, &c. In cases of

disagreement resort may be had to arbitration; if that fails the decision of the Minister of Public Works is final.

By Art. 21 of the Law of June, 1880, control over and superintendence of the construction and working of tramways is vested in prefects of departments, subject to the supreme authority of the Minister of Public Works. In the Department of the Seine, by a ministerial decree of December 12, 1889, this supervision is exercised by the chief engineer of the department, with the assistance of two engineers of the "Ponts et Chaussées" and one engineer of the mines, acting under the direction of the prefect of the Seine and prefect of police. The chief engineer receives 3,000 frs. (120*l*) a year for his services and his three subordinates 1,500 frs. (40*l*) apiece. A staff of eight inspectors and officials of the "Ponts et Chaussées" are under their orders and exercise direct supervision over the tramway system.

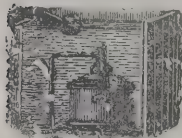
The hours at which tramways run are modified according to different seasons or necessities of the public by the prefect of police, who, after consulting the "Service du Contrôle," gives the necessary directions and communicates any new time-tables to the companies and officials charged with seeing them carried into effect.

Tariffs vary considerably on different lines. They are fixed by the "cahier des charges." According to Art. 33 of the Law of June, 1880, they must be approved by the Minister of Public Works in State concessions and by the prefect in departmental or communal concessions, nor can any alteration in them be made without the prefect's or minister's sanction. They may be revised by the administration every five years. The fares usually charged on tramways within Paris for transport over the whole or part of a line are 30 c. (3*d*) for first-class, and 15 c. (1*½d*) for second-class passengers. First-class passengers secure places in the interior or upon the lower platform of the car, and are entitled to "correspondence," giving them a right to travel without further charge over the whole original line, or change on to any abutting or intersecting line having "correspondence" offices. Second-class passengers ride on the imperial, and must pay first-class fares in order to benefit by "correspondence." Children in arms below four years of age and small parcels not exceeding 10 kilos. in weight, are transported gratuitously. Non-commissioned officers and soldiers in uniform secure all the privileges of first-class passengers on payment of second-class fares.

A clause in concessions usually stipulates that, should the administration require it, the concessionary must organise at

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The Lancet, January 12, 1867.

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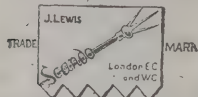
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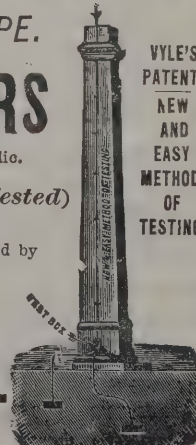
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CHICHESTER DRAINAGE.

At the meeting of the Chichester Council on the 14th inst. the following letter from Mr. Peters, the contractor, addressed to the Mayor and members of the Council generally, was read:—

"Gentlemen,—At your Council meeting held on Friday, April 19 last, a letter from me, addressed to Mr. Prior, the chairman of the drainage committee, was read. In this letter I asked that an extension of two months' time should be granted to me. My reasons for making that application were:—1. The exceptional difficulties which I had encountered in prosecuting the works. 2. The exceptional severity of the winter of 1895. The former difficulties consisted of, for instance, enormous volumes of water only 18 inches from the surface of the ground in the Portsmouth Road, at one end of the district, and 3 feet of water in a 6-feet trench at Whyke Lane, at the other end of the district. The latter I am even now endeavouring to check by means of two pulsometer pumps, each throwing 65,000 gallons an hour, and which may be seen at any time by the Council in operation. In this connection I may point out that so long ago as May 4, 1894, I

drew the attention of the Council to the difficulties which the excessive quantity of water in South Pallant had caused me, and two months previous to that (fifteen months ago), foreseeing from past experience what a heavy rainfall in the close of the year would mean, I asked the engineer for an extension of from four to five months, and you may, perhaps, remember that, owing to my representations, the Council seriously considered the advisability of closing the works for the winter months, and extending the contract over two summers. With regard to my second difficulty, namely, the unexampled severity of the frost, a frost the like of which has not been seen in England for at least fifty years, it must be patent to all that no one could have foreseen such a severe frost, and I am not going beyond the mark in saying that the delay caused to me by that frost, during the continuance of which not a stroke of work could be done, was quite equal to the amount of the extension I ask for. I do most earnestly trust, therefore, that the Council, taking into consideration the facts above enumerated, and believing that I have conscientiously endeavoured in every way to properly carry out my contract, will be kind enough to formally grant the extension I have asked for, and so enable me to complete my work to the entire satisfaction of the Council, its engineer and myself—I have the honour to remain, gentlemen, your most obedient and obliged servant, (signed) P. Peters, Horsham. June 12, 1895."

A letter was also read from Mr. Baldwin Latham, the engineer, with reference to the proposal to take part of the work out of the hands of Mr. Peters, in which he said he did not intend to put the order in force, unless he found it was absolutely necessary, but it must be borne in mind that the conditions of the contract had been departed from, and that Mr. Peters had no right to turn any water through the sewers.

Mr. Prior moved the adoption of the report. He said he thought they could hardly accede that evening to Mr. Peters's request. He would be himself only too glad to fall in with his views, but he was told it would probably vitiate the contract, and he thought the better course would be to allow the question of giving an extension of two months to stand over for the present. When the time came he should press upon the committee to the best of his ability the desirability of acceding to Mr. Peters's request. He thought Mr. Peters had had exceptional difficulties to contend with, and if now Mr. Peters did his best to finish the contract he (Mr. Prior) would be glad personally if the Council gave the request favourable consideration. He sincerely hoped Mr. Baldwin Latham would not

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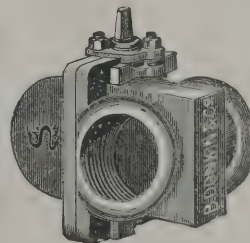
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have to take the work out of Mr. Peters's hands, and he regretted the committee had had to take such measures, because he knew that getting these things on the agenda was a very serious matter for Mr. Peters and his sureties. Mr. Peters had called upon him to explain the difficulties he had had to contend with on account of a remark of a member of the Council to the effect that Mr. Peters would not be able to finish the work in two years. This, Mr. Peters said, had been interpreted as referring to his financial position. He very much regretted that such an interpretation should have been made, because he had every reason to believe that Mr. Peters's financial position was quite unassailable.

Mr. Edney said he could see that the subsoil water had been a curse to the contractor, and he could thoroughly sympathise with him. The contractor did not know so much about the underflow as some people, and it seemed to him he had been sold. The town would know about it before the matter was finished, and he believed the paper circulated about 80,000% would come true. As for the contractor allowing water to run through the sewer, he thought he could never without this have got through the work he had done. He contended that everything his party said had come true, and it was worse even than they had prophesied. He was not going to vote at all; the drainage party had got them into a terrible mess, and they must get them out of it.

Mr. Buckell said the fact was that, though there had been a considerable amount of trouble with the subsoil water, the greater part of the work had been accomplished, and Mr. Peters would be able to do the rest perfectly easy. It was simply a matter of the time he would have to do it in. He thought it would be better if the whole question of Mr. Peters's request stood over until the work was finished. He believed the Council would then meet him fairly, while remembering the claims the ratepayers had upon them.

Mr. Prior said that was what he meant to move, and at the suggestion of the Mayor this was added to the motion.

Mr. Fielder said Mr. Peters had undoubtedly had unforeseen difficulties, and he gave very plausible reasons why he should be allowed an additional two months to complete the work in. He thought it a reasonable request, and that the best plan would be to let him know at once he would have the two months he asked for.

The Town Clerk said he thought it would be most unwise on the part of the Council at present to attempt to vary the contract. If they extended the time they would have to enter

into a fresh contract, and the sureties would be released from their responsibility, and have to enter into another bond. Under the circumstances he should certainly advise any private client, and he advised the Council, to leave matters as they were. He did not see how Mr. Peters could be hurt. If he had a sort of quasi-assurance on the part of the Council that the difficulties he had encountered in carrying out the work would be considered, it was as much as Mr. Peters could expect under the circumstances. Looking at all the legal surroundings of the case, he thought it unwise for the Council to vary the contract.

Mr. Fielder said after hearing that statement he would withdraw the resolution he was about to propose.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

11075. Timothy Daly, for "A new plan of window ventilation."

11105. Albert Callister, for "Improvements in apparatus for raising and lowering window sashes and for retaining same in any desired position."

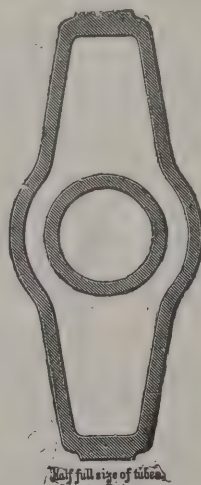
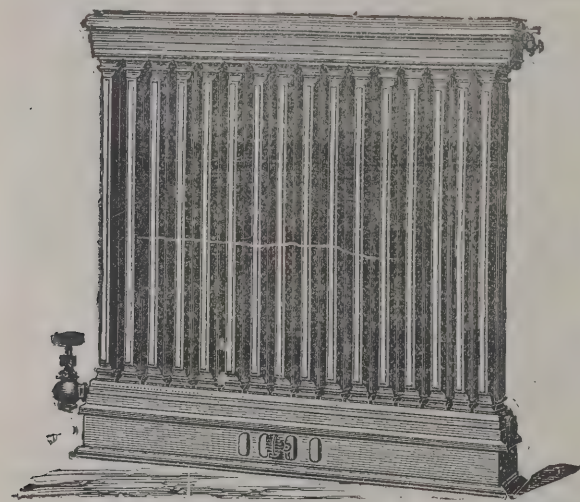
11131. William Thomson and Newton Trevithick Thompson, for "Improvements in water-closets and in valves and supply cisterns therefor, and for other purposes."

11132. Donald Simpson and Alexander Cross, for "An improved hinge for opening and closing window sashes."

11216. Christian Lenz and Johannes Stumpf, for "Improvements in and relating to window frames and sashes or case-ments."

11285. Edward Bauer and Franz Fried, for "Improvements in and relating to water-waste preventers for flushing purposes."

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There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

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AINTREE.—For Public Hall, Institute, Café, Stables, &c. Mr. F. W. Dixon, Architect, Guardian Building, Manchester.

AYLESBURY.—July 3.—For Additions and Reseating Baptist Chapel. Mr. F. W. Taylor, Architect, Aylesbury.

BANGOR.—July 10.—For Hostel for Women Students. Messrs. Grierson & Bellis, Architects, Bangor.

BARGOED.—July 1.—For Additions to Board School. Messrs. James & Morgan, Architects, Charles Street Chambers, Cardiff.

BIRKENHEAD.—July 13.—For Vestibule and Shops at Market. The Borough Engineer, Town Hall.

BLACKBURN.—July 1.—For Building Mortuary and Chimney Works, &c., at Infirmary. Messrs. Simpson & Duckworth, Architects, Richmond Chambers, Blackburn.

BRADWELL.—July 3.—For Farm Premises and Double Cottages. Mr. A. S. Hewitt, Architect, 10 Regent Street, Great Yarmouth.

BRISTOL.—July 10.—For Public Library. Mr. W. V. Gough, Architect, 23 Bridge Street, Bristol.

BURTON-ON-TRENT.—June 28.—For Alterations at Boys' School. Mr. Reginald Churchill, St. Paul's Square, Burton-on-Trent.

BURNTWOOD.—July 8.—For Alterations to Schools. Mr. D. C. Marks, Architect, Lichfield.

BUXTON.—July 6.—For Cookery Room, for School Board. Mr. W. R. Bryden, Architect, 1 George Street, Buxton.

CHICHESTER.—July 11.—For Manager's House and Cottages at Sewage Disposal Works. The Resident Engineer for the Sewerage Works, Lion Street, Chichester.

CLYDEBANK.—July 8.—For the Various Works for Building Hospital near Blawarthill. Mr. R. A. Bryden, Architect, 212 St. Vincent Street, Glasgow.

CRICKHOWELL.—July 4.—For Villa. Mr. John Richards, Vine Tree House, Llangattock.

DENBIGHSHIRE.—July 1.—For Taking-down and Rebuilding Upper Bedwell Bridge. Mr. R. Lloyd Williams, County Surveyor, Denbigh.

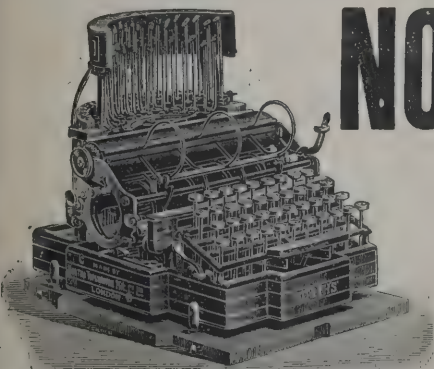
DYMCHURCH.—June 28.—For Construction of Three Groynes in Sea Wall. Mr. Edward Case, Expenditor, Dymchurch.

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PAISLEY.—July 8.—For New Grammar School, &c. Mr. T. G. Abercrombie, Architect, Gilmour Street, Paisley.

PENZANCE.—July 1.—For Alterations to Day School. Mr. J. W. Trounson, Architect, 27 Clarence Street, Penzance.

PETERBOROUGH.—July 2.—For Building Parish Schools, Mr. H. M. Townsend, Architect, Cross Street, Peterborough.

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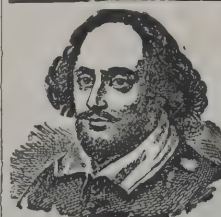
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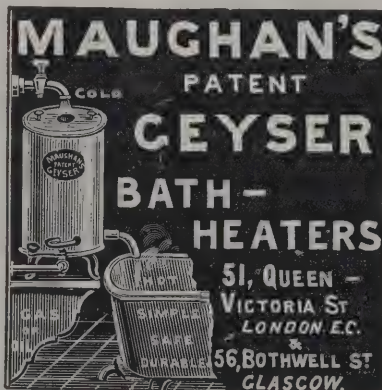
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Heath, bar-fitter 580 0 0
Winn, gas-fitter 104 0 0

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A. Hood* £966 0 0
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J. Mears	470	0	0

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R. & E. Evans	671	0	0
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G. Osenton, Westerham	13,037	0	0
J. Shunn, Fulham	12,697	0	0
J. Mowlem & Co., Westminster	11,601	0	0
T. Adams, Wood Green	10,979	0	0
W. Woodham, Lower Sydenham	10,731	0	0
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J. Neave, Forest Hill	10,440	0	0

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Enock Bros., Trebanog	£3,110	0	0
J. James, Penygraig	3,055	0	0
E. Evans & Sons, Penygraig	3,028	0	0
T. MORGAN, Penygraig (accepted)	2,975	0	0

PONTRHONDDA.

For Erection of Two Shops at Pontrhondda, for Messrs. Phillips & Williams. Messrs. GRIFFITHS & JONES, Architects and Surveyors, Tonypandy and Pontypridd.

J. Rees, Ynysyawl	£820	0	0
Parry Bros., Trealaw	680	0	0
ROWLAND & LLOYD, Tonypandy (accepted)	630	0	0

ROXBURGH.

For Erection of Corbet House, Roxburghshire, for Mr. A. Sholto Douglas. Messrs. HARDY & WRIGHTS, Architects, Edinburgh.

Dickieson, Kelso	£6,625	0	0
Watherston, Edinburgh	5,830	0	0
Herbertson, Galashiels	5,635	0	0
Inglis, Jedburgh	4,922	0	0
BRUCE, Kelso (accepted)	4,550	0	0

SCARBOROUGH.

For Central Hall Sunday Schools, Westborough, Scarborough. Mr. WILLIAM WATSON, Architect, Wakefield.

Accepted Tenders.

J. Bastiman & Sons, excavating brick, stone and plaster work	£995	0	0
G. Scales, carpenter and joiner	732	10	0
Craven & Son, plumbing and glazing	123	8	0
Appleby & Brogden, ironwork	100	0	0
Joseph Hardgrave, slating	90	0	0
H. Jackson, painting and staining	43	2	0

£2,084 0 0

SETWELL HILL.

For Country House, for Mr. A. D. Wells. Mr. S. C. JOHNS, M.S.A., Architect, Wallingford.

E. HOLLY, Nettlebed (accepted)	£1,837	10	0
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SCOTLAND.

For Rebuilding School, Thornliebank, for the Eastwood School Board.

Cameron & Dalglish, Thornliebank, mason	£3,276	13	2
D. Livingstone, Pollokshaws, joiner	1,580	0	0
W. Meikle & Co., Glasgow, slater	369	3	8
D. R. M'Callum, Pollokshaws, plumber	267	11	10
M'Culloch & Co., glazier	157	14	8
Gray & Co., Pollokshaws, plasterer	125	2	5
M. Sproull, Glasgow, gas-fitter	65	18	0
W. M'Gregor Adam, Pollokshaws, painter	75	9	5

SHIREBROOK.

For Building Board Schools, Shirebrook, Derbyshire. Mr. FREDERICK BALL, Architect, Nottingham. Quantities by the Architect.

J. Shaw, Nottingham	£3,550	0	0
A. Eastwood, Warsop	3,500	0	0
Fisher Bros, Mansfield	3,500	0	0
J. Collingham, Langwith	3,500	0	0
W. Maule, Nottingham	3,495	0	0
A. G. Bell, Nottingham	3,416	0	0
J. H. Vickers, Nottingham	3,363	0	0
JOHN OSCROFT, Nottingham (accepted)	3,357	0	0
J. Greenwood, Mansfield	3,333	0	0
W. E. Shaw, Ilkeston	3,199	0	0

SPENNYMOOR.

For Erection of Business Premises at 44 High Street, Spennymoor, for Mr. J. Dodshon. Mr. H. HENRY, Architect, 14 North Bailey, Durham.

R. Telfer, Craddock Street	£714	0	0
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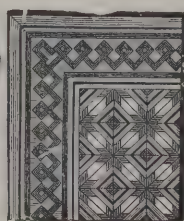
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W. Bell & Sons, Walkley, Sheffield	£1,625	0	0
J. Trippett, Chapelton, near Sheffield	1,530	0	0
J. E. Nadin, Walkley, Sheffield	1,218	0	0
G. HALL, Heeley, Sheffield (accepted)	1,181	0	0

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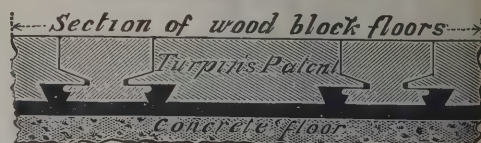
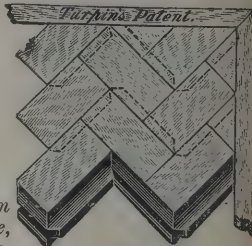
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For Erection of a Cottage in the Eythrop Road, Stone, for Mr. Thomas Monk. Mr. GUEST LUCKETT, Architect, Aylesbury.

Wallis & Sons, Chesham	£227	0	0
Grimsdale, Aylesbury	217	0	0
Siarey, Aylesbury	190	0	0
Senior & Clarke, Wendover	186	18	8

STOURBRIDGE.

For Erection of a Hop Warehouse at Messrs. Edward Webb & Son's Royal Seed Establishment, Wordsley, Stourbridge. Mr. T. GRAZEBROOK, Architect, Stourbridge.

J. Green, Birmingham	£3,450	0	0
H. Dorse & Co., Cradley	3,345	0	0
W. Robinson, Birmingham	3,234	0	0
M. Hughes, Birmingham	3,171	0	0
H. Lovatt & Son, Wolverhampton	3,095	0	0
C. Horton, Brierley Hill	2,866	0	0
J. GUEST & SONS, Stourbridge (accepted)	2,860	0	0
W. Willetts, Dudley	2,789	0	0

WESCOTT.

For Erection of Assembly Hall, for Mr. J. E. Taylor. Mr. GUEST LUCKETT, Architect, Aylesbury.

W. H. SIAREY, Aylesbury.

Accepted at the Architects' Compendium Schedule for 1895.
No competition.

THE *Carlisle Journal* says:—A meeting of the Lancashire, Cheshire and Northern Districts Branch of the Incorporated Association of Municipal and County Engineers was held at Keswick, about forty members and friends being present, including Mr. W. Howard Smith, city surveyor, Carlisle, Mr. E. B. Newton, one of his assistants, and Mr. R. Pickering, Whitehaven. By the invitation of Mr. H. Harkewitz, the party paid a visit to the quarries of the Threlkeld Granite Company, Limited, at which over 200 men are now employed, and last year's output reached 80,000 tons. The granite found at Threlkeld is exceedingly hard, and is mostly used for making paving setts, macadam and street flags. During the course of inspection a huge block of granite weighing about 1,000 tons was blasted, and the company also had an opportunity of witnessing the preparation of the setts, flags and cement turned out at these works.

ILLUSTRATIONS.

LONDON SCHOOL BOARD OFFICES, VICTORIA EMBANKMENT.

EXTERIOR, JUNIOR CONSTITUTIONAL CLUB, PICCADILLY.

CENTRAL BAY, NORTH SIDE OF CHOIR, ST. SAVIOUR'S CHURCH, SOUTHWARK.

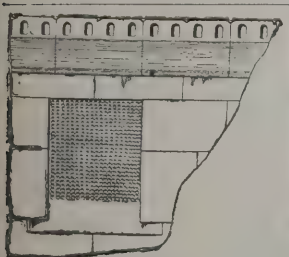
NEW PRESBYTERIAN CHURCH, BROMLEY, KENT.

A NEW church and adjoining buildings were opened on Wednesday last, the 26th inst., for the Presbyterian Church of England, situated in Freeland's Road, Bromley, Kent. The buildings, which occupy a site on the east side of the road, 150 feet by 70 feet, consist of a church, with nave, aisles, and transepts, seated for about 720 worshippers; a hall for Sunday school purposes, to hold about 240, and a conveniently planned arrangement of vestry session, Dorcas and classrooms, and ample lavatory accommodation; a kitchen and heating chamber are provided in the basement. There are small galleries in the nave and transepts, the choir and organ occupying the north gallery. Red brick, with Douling stone dressings, has been used for the external walls and the interior of the church, the seating and gallery fronts are of pitch pine, and the pulpit, communion table, &c., of oak. The design of the buildings is twelfth and thirteenth century Gothic with semicircular arches frequently introduced as in many of the more northerly examples of the period, and there is a spire rising to a height of about 118 feet. The cost of the church and buildings, including organ and fittings, but exclusive of site, will be about 8,000l. The general contract for the work has been admirably carried out by Mr. John Bentley, of Waltham Abbey; Messrs. Charteris & Longley's system of wood-block flooring has been used throughout the church hall and passages on the ground floor; Messrs. B. Ward & Co.'s granolithic concrete has been used for the stairs. The gas work is by Cannon & Sons, of Southwark, and the heating apparatus is by Musgrave & Co., of London and Belfast, and the organ is by Bevington & Sons, of Soho. Mr. John C. T. Murray, of Old Queen Street, Westminster, is the architect, the quantities have been taken out by Messrs. W. H. Barber & Son, of Adelphi, and Mr. Geo. Barber has acted as clerk of the works.



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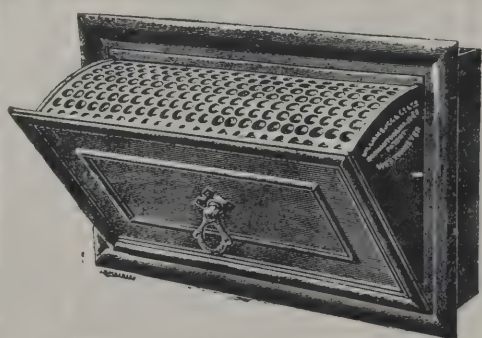
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SUGG'S

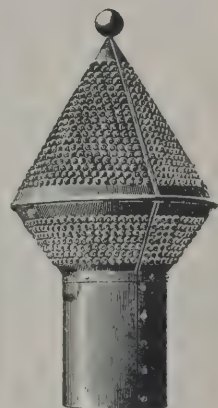
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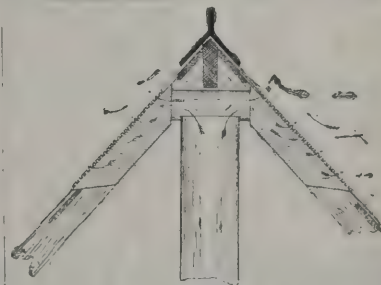


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ELECTRICAL.

AT Ayr the Deacons' Court of Sandgate Free Church have unanimously agreed to introduce the electric light into the church. This is said to be the first church in Scotland to avail itself of the new method of lighting.

AT the meeting of the Town Council, Stoke-on-Trent, the question of the extension of the tramways to Trent Vale was considered, and Mr. Wain stated that the company would immediately apply for a provisional order to extend the line to Hanford Bridge as desired, providing the Corporation gave its consent to their proposals. The sub-committee recommended that, subject to the whole of the local authorities in the district being of the same mind, and to satisfactory replies being received to inquiries to be made by the town clerk from places where overhead traction had been adopted, the Corporation should consent to the introduction of electrical traction by means of overhead wires, and subject to the company giving a satisfactory undertaking to apply for a provisional order to extend the present terminus in London Road to Hanford Bridge within a period of two years from the date of the granting of such order.

It has been found necessary to extend the electric light department of the Halifax Corporation. When the new plant was laid down a year ago about 2,000 lamps, each of 16-candle power, had to be supplied. Now the demand has risen to 3,500, and in order to meet the anticipated increase next winter it has been decided to double the present motive power, which is equal to 500-horse. An order has been placed with the Electric Construction Company, Limited, for a 300-unit dynamo, to be coupled direct to a 600 horse-power vertical engine of the Politt & Wigzell make.

VARIETIES.

THE *Dundee Advertiser* says:—The British Aluminium Company has now actually begun the work of "harnessing" (to use the American word) the Falls of Foyers. The company's first step will be the construction of a large tunnel, cut through solid rock, and on this some 500 men will shortly be engaged.

THE Hammersmith New Town Hall, for which Mr. H. Richardson's design was accepted by the Vestry, will be carried out. Mr. Walter Herring has been appointed quantity surveyor. The work is to cost about 25,000*l.*

THE fourth loan exhibition of pictures in the Art Gallery at the Free Library at Walsall was opened on Monday by Mr. Whitworth Wallis, curator of the Birmingham Art Gallery and Museum. Mr. T. A. Hill has lent no fewer than ninety-eight works.

DURING a thunderstorm at Clackmannan the lightning struck the steeple of the established church, and displaced one of the ornamental turrets, which went through the roof and considerably damaged the pew of Lord Balfour of Burleigh, which had been lately renovated.

THE *Scotsman* says:—At a recent meeting of the heritors of the parish of Auchterarder sanction was obtained to the taking down of the two old bells which have done duty in the steeple of the parish church since 1754, in order that these may be replaced by a new bell which the congregation intend to provide by subscription. One of the bells has, indeed, summoned the parishioners to worship for a very much longer period than since 1754, and is said to be 700 years old, having tolled in the Auld or Laigh Kirk, the ruins of which still stand north of the burgh. The bells, along with some other interesting antiquarian relics—a pre-Reformation baptismal font and the framework of an old spiral clock in the steeple—are to be retained by the heritors of Auchterarder.

THE South Staffordshire Mines Drainage Commissioners have passed a resolution confirming a mortgage between the commission and the Public Works Loan Commissioners for securing a loan of 100,000*l.* on the Tipton mines drainage rate, &c.

BUILDING AND BUILDERS.

THE Theological College at Manchester is to be enlarged, at a cost of about 9,000*l.* One of the delegates to the Primitive Methodist Conference at Manchester offered to defray the whole of the expenditure, and this generous offer was accepted with thanks.

THE *Durham County Advertiser* says of the joiners' strike in the Consett District that seven of the master builders have come to terms with their men, who have resumed work. A meeting of the journeyman joiners on strike appointed a deputation, who subsequently interviewed the employers at a meeting held at the Station Hotel, Blackhill. In the course of a protracted discussion, it was elicited that the masters were generally disposed to grant the increase of wages asked for,

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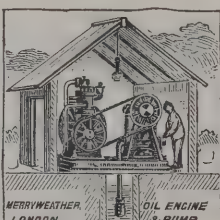
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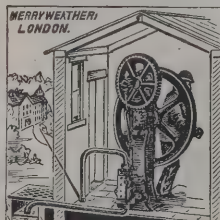
The "Times" says:—"A Practical Pamphlet."



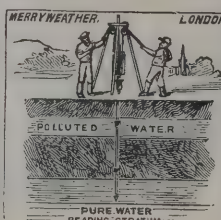
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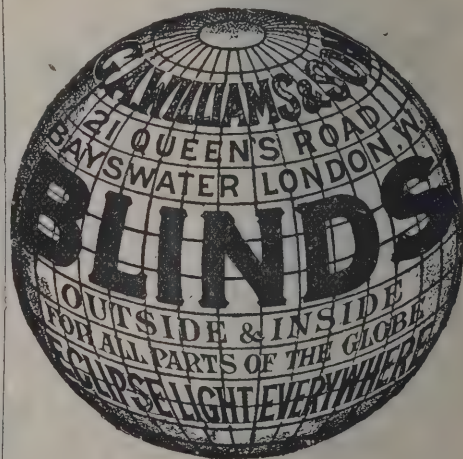


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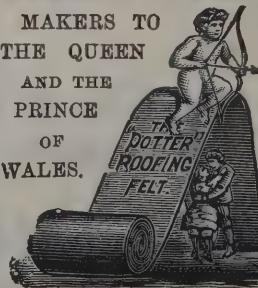
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but they strongly objected to the adoption of the trades rules for the Consett district. The meeting broke up without any settlement being come to, and some of the journeymen are so sick of the business that they resumed work.

At the meeting of the Norwich Town Council, the scheme for the erection of public baths, which for some time has been under consideration, has been shelved for twelve months.

PLANS of new buildings to be erected in Aberdeen have been sanctioned to the value of 17,000*l*.

TRADE NOTES.

THE new buildings for the County Asylum, Lancaster, which are being erected at a cost of about 20,000*l*., from the plans and under the superintendence of Mr. E. Howard Dawson, architect, of Lancaster, are now nearing completion. The inlet ventilating appliances have been supplied by Messrs. E. H. Shorland & Brother, of Manchester.

THE "Climax" Relief Valve Company inform us that in consequence of the rapid increase of their business, they have removed to larger premises at 209 City Road, E.C.

A STAINED-GLASS memorial window, consisting of three lights, is to be inserted in the church at Pipe Hays, Lichfield, from the design of Messrs. Swain Bourne & Son, artists in stained-glass, Birmingham and London. The subjects are those of "The Good Shepherd" in the centre light, whilst on either side respectively are figures illustrative of Divine truth, the details of which are of an elaborate treatment.

At a meeting of the Glasgow Town Council as improvement trustees it was agreed to invite tenders for the erection of houses in the Anderston district and in the Townhead district for the purpose of meeting the requirements of the working classes.

At the meeting of the Stoke-on-Trent Town Council a sub-committee was appointed to visit various towns for the purpose of more minutely investigating the various systems of sewage disposal. On the recommendation of the finance committee it was resolved that application be made to the Local Government Board for sanction to borrow 2,247*l*. 7*s*.—for improvement of the Trent Bridge, 486*l*. 7*s*.; Lytton Street sewer, 150*l*.; palisading the canal in London Road, 90*l*.; and constructing new road to Basford, 1,520*l*.

PAINTING WITHOUT BRUSHES.

ON Monday last the Barry Dock, Cardiff, was the scene of some important and interesting experiments with a machine which is likely, if not to revolutionise, at least to very extensively modify the methods of the painting trade. The machine in question is the property of the Pneumatic Brushless Painting Machine Syndicate, whose address is Trafalgar Buildings, Northumberland Avenue, and is simple in construction, effective and exceedingly rapid in action, and comparatively inexpensive to purchase. It applies the paint or other liquid to the surface to be coated in an atomised condition by the action of an air-blast, the paint being for this purpose contained in a closed vessel into which air is pumped whereby the paint is forced through a tube at a rate dependent on the pressure of the air supplied to the vessel. At the orifice of this tube the stream of paint is met by a blast of air issuing from a nozzle, the blast being supplied through a flexible tube whereby the stream of paint is pulverised and projected in the form of exceedingly fine spray, the blast being produced by a hand-operated air-pump or compressor provided with a reservoir in order to render the blast continuous. By this means a uniformly smooth surface is quickly obtained without any of the care necessary to avoid the marks left by a brush when one is used in the ordinary way.

Among the demonstrations of its utility which were given on Monday were the painting of doors, panels, carved and moulded woodwork, Lincrusta surfaces, &c., all of which were coated in an incredibly short space of time and with an accuracy and fine finish which left nothing to desire. A competition in which a railway wagon was painted by the machine in 16½ minutes, as against another painted by two men in 19½ minutes, and the painting of a ship's side at the astonishingly rapid rate of 80 square feet in 6½ minutes. Even this rapidity, by the way, can be almost indefinitely augmented by the multiplication of the above-mentioned nozzle; but each additional one would, of course, require an increased pneumatic pressure. The machine in its simple form will, however, be found amply sufficient for all ordinary purposes, and will prove invaluable in the painting of large surfaces such as railway-station roofs, bridges, &c., as well as for all kinds of internal and external decorative work of extended superficial area. In its present form it will hardly supersede the brush in detail work, such as the picking out of beadings and mouldings, but will prove a valuable auxiliary to it in the treatment of carved

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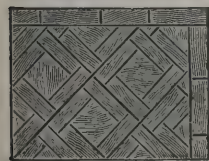
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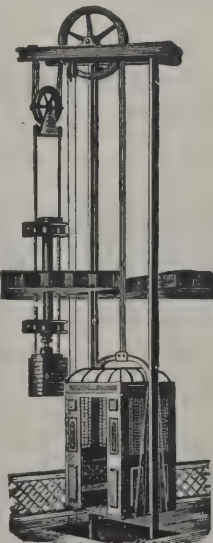
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or cast work, as the spray readily penetrates into interstices which the brush would not enter; for this reason also its utility in painting girders, boilers, and other constructive ironwork will be at once apparent. The machine is, as mentioned above, simple in construction, and hence cannot readily get out of order, and in the event of its becoming clogged, which does not frequently happen, a mild dose of turpentine will at once put matters right again. It is economical from the fact that it deposits more evenly and produces a finer surface, so that fewer coats are required to produce a given finish, and for the same reason less fining down is needed, as after the first coat has been sandpapered, no further preparation is required. Far less scaffolding is necessary, as an extension is fitted to the machine giving a range of 6 feet from one standpoint, instead of working at the utmost at arm's length, and of course all the cost of wear and tear, loss and misappropriation of brushes is obviated.

THE HOUSE BEAUTIFUL.

MR. PUNCH'S time-honoured advice "to those about to marry," which advice, by the way, has not been too generally taken *au sérieux*, should now be negative to date, to advocate a visit to Messrs. Graham & Banks, 445 Oxford Street, where this enterprising firm, both members of which may be said to have a life-long intimacy with decorative art, have fitted up a model house, the various apartments of which, in sufficient harmony one with another, each illustrates in itself a distinct style or period, while the whole is designed as an object-lesson as to how a house can be artistically decorated and furnished at a cost varying from 500*l.* to 5,000*l.*; and it is well to observe (indeed, the fact is too obvious to be overlooked) that beauty, although everywhere conspicuous, in no wise takes precedence of comfort, which instead accompanies it step by step.

The entrance-hall is a sumptuously and picturesquely appointed apartment of the period of Francis I., of artistic memory. A conspicuous feature of this room is to be the chimney-corner. This was not finished on the occasion of our visit, but without it the rich panelling of the walls and ceiling, the elegant hangings and choice furniture are sufficiently satisfying to reconcile one to the absence of additional attractions. The dining-room is an essentially restful and cosy room in

Carolean or Jacobean style, with its quiet but substantial oaken furniture and painted tapestry frieze representing a hunting scene. In this room also the fireplace is treated, as it should be, as an important feature, as is the roomy recessed window with its gracefully draped curtains. The drawing-room, with its white walls panelled in soft delicate rose, is in Louis XVI. style, and the harmonious blending of shades of pale rose and green in the carpet, furniture and hangings is wonderfully light and elegant. The decoration of the staircase is rich and warm in tone and distinctly oriental in character, an effect to which the Moorish arches fixed to the doors materially contribute. The principal bedroom, which is enamelled in very pale pink and cream, is arranged entirely on the "fitment" principle, which, although it reduces the apparent size of the apartment, provides an immense amount of wardrobe and cupboard accommodation, and at the same time does away with all excrescent furniture and gives a wonderfully snug and compact appearance to the room without in the least suggesting stuffiness. Another room is 'contrived a double debt to pay'—bedroom by night and sitting-room by day. A chimney-corner really built out into the room, but apparently recessed from it, gives space for an ingeniously concealed cupboard on either side, in one of which stands the washstand and appurtenances, while the other makes a capital wardrobe; the artistically draped bedstead stands in another nook, and can be concealed from view by a curtain, and a dainty little boudoir alone remains. The model house is lighted throughout by electricity—in some cases very ingeniously, as, for instance, in the hall, where, shining through a casement, it produces quite the effect of daylight where real daylight could not be obtained.

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In regard of the illustrations, which are intended to indicate the extent and character of their business, those views which illustrate the interiors of various churches and show the beautiful wood fittings and carved woodwork executed by them are excellently adapted as a guide by which to judge of the excellent work hitherto carried out by the company. Taking the plates in order, we are first introduced to the main building, not an unsightly one, but a handsome building, two sides of which give an idea of the character of the structure. Next, the railway entrance to the saw mill shows the convenience for delivery and despatch. There follow views, one of the wood-block flooring department and other views, including those in the saw mill, also drying kiln (six in use), the seasoned stock-yard, drying sheds (650 feet long by 30 feet wide), interior views of the joiners' shops, the wood-block flooring department, drying-shed on dock side, timber stocked on dock side, timber rafts in ponds, vessels discharging timber, &c. Some views represent the offices, private office rooms as well as the general office, and there we begin to see in the fittings some of the able adaptation of wood of various kinds. The work executed for churches is well shown. The examples shown are too numerous to deal with. Many, no doubt, are acquainted with them, viz. the beautiful carved oak roofing and fans at Stonyhurst College, the seating at St. Joseph's Church, West Hartlepool, the seating at St. Michael's, Newcastle-on-Tyne, with nave roofs, these works having been executed for Messrs. Dunn, Hansom & Dunn, architects, Newcastle-on-Tyne. Also excellent chancel fittings for St. Cuthbert's, Chester-le-Street, staircases, ceilings, panelling, mantel-pieces, &c., for private mansions, &c. In addition the provision of bar-fittings is no small branch of work, and there is also illustrated a fine example of a conservatory, made for Aldin Grange, Durham. Many will be interested in seeing the pleasing designs they have worked out in their inch solid oak parquet flooring.

RUTHERGLEN BRIDGE, GLASGOW.

ON June 19, the memorial stone of the new bridge across the Clyde was laid by Mr. John Macfarlane, convener of the joint-bridge committee. The bridge it will supersede, and which James Watt is supposed to have designed, was closed in 1890. The delays in erecting a new bridge arose, says the *Glasgow*

Herald, from the number of local authorities directly concerned, which at the outset numbered no less than five, viz. :—Glasgow, Rutherglen, the two road committees of the counties of the lower and middle wards of Lanark, and the county of Renfrew, all of whom had to agree before building operations could commence. Having in view the increasing requirements of the city and its surroundings, the representatives of Glasgow and Rutherglen desired that the new bridge should be of a width, durability as regards material, and in other respects worthy of the two municipalities, while the county representatives were content with a bridge of less width, and to be of steel or iron instead of granite. Ultimately a friendly arrangement was come to, that the bridge should be built in accordance with the view of Glasgow and Rutherglen, the county share of the cost being limited to a definite sum, based on their idea of the requirements. Owing to the increased width of the bridge, it became necessary that additional ground for its site and approaches should be acquired, and the negotiations for this and for restricting the working of minerals in proximity, all which have been arranged for, consumed a further considerable time. In the interim a substantial service bridge to carry the traffic and enable the old bridge to be removed, and admit of the new one being erected on its site, was constructed by Messrs. Hugh Kennedy & Sons, builders, Partick, and opened to the public on April 22, 1890, at a structural cost of 3,171*l.* 15*s.* The old bridge was on the same day closed against all traffic, and subsequently removed as part of the contract for the new bridge. Plans of the new or permanent bridge were submitted by Messrs. Crouch & Hogg, the engineers, on January 2, 1891, and the consent of H.M. Board of Trade, with a conveyance by that Department of the foreshore and bed of the river, which is here tidal, having been obtained, alternative specifications were prepared and tenders by contractors advertised for. Seven contractors of standing sent in offers, and that of Messrs. Morrison & Mason, Limited, was on January 27, 1892, provisionally accepted, pending the final agreement between the burghs and the county as to the width and material of which the bridge was to be constructed. This was finally arranged, and a minute of agreement signed and sealed of dates February 13 and 27 and May 11, 1893, approving of the plans, and settling the quotas of expense to be borne by each authority. Acting upon this agreement, the special building committee appointed to carry out the work lost no time in arranging with the contractors, and operations were commenced by them on February 23, 1893. Owing to softer material than the pre-

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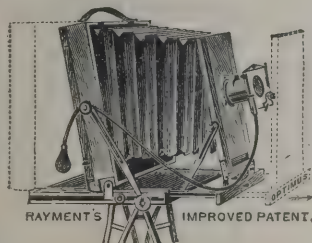
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liminary bores had given reason to suspect appearing in the excavations for the abutments on both sides of the river, some delay and expense in piling to secure the requisite support occurred in the end of 1893 and early part of 1894, since when, however, steady progress has been made, and with a most gratifying immunity from accident to life or limb, but, owing to difficulty experienced in obtaining supplies of granite, it will be another year before the bridge is completely finished and opened to the public. The architectural features of the bridge are thus described by the engineers:—The new bridge consists of three segmental arches, the centre one having a span of 100 feet and a rise of 12 feet 6 inches, and those on either side of it a span of 90 feet and a rise of 11 feet 7 inches. The clear width between parapets is 60 feet—a roadway of 36 feet wide and two foot pavements of 12 feet each. There is ample room for two lines of tramway, as well as for the ordinary traffic, and the gradient of the approaches is 1 in 60. The arches are of granite, and the abutments, spandrels and piers are faced with granite, which is being supplied from Aberdeen, Dalbeattie and Cornwall. The courses are chamfered, and the piers are formed with starlings or cutwaters at either end, surmounted by massive caps, from which pilasters are carried up between the arches, and there are larger pilasters at the abutments. A bold cornice, with classic mouldings, runs along the whole length of the bridge, and is carried through the abutment and pier pilasters, and the parapet, which is solid, rises above this. Being built of granite, no ornamental work in the shape of carving has been attempted, but the endeavour has been to obtain a satisfactory architectural effect by a well-proportioned and graceful outline. Respecting the mode of conducting the work, the engineers report that at the abutments the ground was excavated and bearing piles driven to an average depth of 43 feet, so as to secure a reliable foundation.

The most difficult portion of the work—that of founding the piers—was accomplished by the pneumatic process. The piers consist of a lower portion, or caisson, built of steel plates, and forming what is known as the working chamber, in which all the excavation is carried on, and which communicates with the surface by means of circular shafts, 3 feet in diameter, up which the excavated material is hoisted, and by which the men enter and leave the working chamber. The caisson, with the exception of the working chamber, is filled with concrete, and above it there is a height of solid brickwork reaching to the bed of the river, and on this brickwork the pier

proper, consisting of freestone ashlar, faced with granite, is built. The caisson is first of all erected on staging, then lowered to the river bed and the air-locks, through which the men and excavated materials pass, fixed into position on the top of the shafts. The caisson is then filled with concrete, and brickwork added till the top is well above high-water level. Air, at a pressure sufficient to exclude the water, is then forced into the working chamber, and men descending to it by the shafts, the work of excavation is commenced. As it proceeds the pier slowly sinks, more brickwork being added so as to keep its top always above high water. When the proper height of brickwork has been built the granite and freestone masonry is commenced, and added to in the same manner as the brickwork, till at length the cutting edge of the caisson reaches the rock at about 57 feet below high water. The working chamber and shafts are then filled with concrete, and the building of the pier completed. The great novelty of this portion of the work lies in the fact that the pier proper is actually being built while its substructure is in constant motion, and, consequently, careful watching is required, so that when the caisson finally reaches the rock the upper portion shall be in its correct position. At the present time the abutments and piers are complete as far as it is possible to go till the arches are turned, and preparations are now so well forward that this work is expected to be finished in the autumn, and the bridge itself open for traffic early next year. The total estimated cost for ground and approaches, construction of the new and removal of the old bridge, including engineering, &c., fees, inspector's wages and miscellaneous, was 70,000*l.*, of which the county of Lanark contributed a slump sum of 12,000*l.*, the burgh of Rutherglen in the proportion of 1*s.* 5½*d.* per 1*l.*, equal to 5,104*l.* 3*s.* 4*d.*, and the city of Glasgow the balance of 52,895*l.* 16*s.* 8*d.*, or 15*s.* 1½*d.* per 1*l.*

LANCASHIRE BUILDERS.

THE first general meeting of the Lancashire Building Trade Employers was held at Accrington on the 18th inst. Mr. John Fecitt, Blackburn, presided, and in opening the meeting spoke of the necessity that existed for employers to organise not only to combat more effectually combinations of the workmen when they tried to impose unfair restrictions on trade, but to obtain from architects and the public generally juster and more generous treatment. Though the building trade was one of, if not the most important of, the industries of the country,

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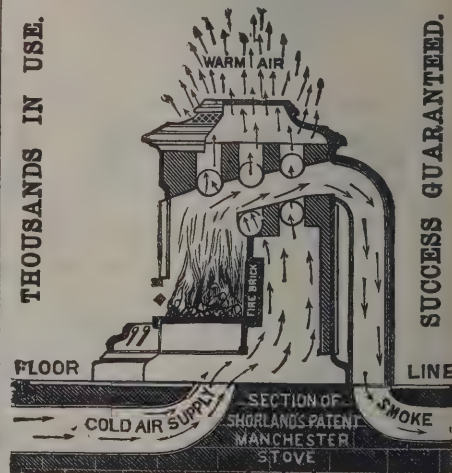
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he thought the fact was not recognised as it ought to be. The report of the provisional committee was then presented. After detailing what had been done to strengthen the Federation since it was established in December last, the committee stated that the scheme had been very favourably received throughout the county. Several other towns were expected to become affiliated shortly, and in districts where no local associations at present exist, the expediency of forming branches was under consideration. Returns of the relations between employers and employed in the federated towns were also presented. The report was adopted. Mr. Fecitt was elected president for the ensuing year, and Mr. Councillor Cunliffe, Bolton, was elected vice-president; Mr. F. W. Briscoe, Bolton, treasurer; and Messrs. W. Shepherd, Rochdale, and J. Hawley, Colne, auditors; together with an executive committee. Mr. John Tomlinson, of Preston, secretary of the Master Builders' Association in that town, was elected secretary. The draft rules were then considered, and a few alterations having been made, were adopted and ordered to be printed. On the motion of the Bolton representative, it was decided to try and affiliate the Federation to the National Association of Master Builders of Great Britain. The Darwen representatives reported the settlement of the masons' strike in their town, and after hearing the Chorley delegates, it was agreed to support the local employers in their dispute with the operative joiners. A long discussion ensued on the best method of strengthening the Federation, and a sub-committee was appointed to visit the non-associated towns and explain the objects of the Federation. It was decided to adopt a form of conditions of contract, &c., to be approved by the committee for use in the federated towns not at present having one, and after a considerable debate a resolution on the subject of prime cost sums in building quantities was referred to a future meeting. A vote of thanks was passed to the chairman for presiding.

HOUSES FOR WORKING CLASSES IN GLASGOW.

A REPORT has been prepared by the city engineer of Glasgow showing the probable financial income of the new buildings proposed to be erected in the Anderston district. The report stated that the engineer had, along with the manager, considered the rentals which might be derived from the properties which it is proposed to erect in Warroch Street, Stobcross Street, and Cheapside Street, and find that, rating shop floorage

at values of 1s., 1s. 3d., 1s. 6d. per square foot, and charging twenty-one houses of two apartments at 9l. 15s., and six houses of two apartments at 9l. 18s., there will be a gross rental of 453l. 8s. 9d. derived from the whole subjects. The buildings are estimated to cost 4,335l., and the area of ground occupied is 790 square yards. Making the customary abatement of 25 per cent. from the gross rental, and charging interest upon the cost of the buildings at 3½ per cent., there remains a free surplus of 188l. 9s. 3d., which, capitalised, is equivalent to 4l. 12s. 6d. per square yard for the site. He also considered the rentals which might be derived from the properties which it is proposed to erect in Cheapside Street, Stobcross Street and Piccadilly Street, and found that, rating shop floorage at values of 1s., 1s. 3d., 1s. 6d. per square foot, and charging three houses of three apartments at 12l. 10s., twelve houses of two apartments at 9l. 15s., eleven houses of two apartments at 9l. 10s., and sixteen houses of one apartment at 5l., there will be a gross rental of 517l. 7s. 6d. derived from the whole subjects. The buildings are estimated to cost 5,571l. 12s. 6d., and the area of ground occupied is 900 square yards. Making the customary abatement of 25 per cent. from the gross rental, and charging interest upon the cost of the buildings at 3½ per cent., there remains a free surplus of 193l. 3s. 6d., which capitalised is equivalent to 4l. 6s. per square yard. The sub-committee approved the report, and resolved to recommend as follows:—

1. That the city engineer be authorised to prepare the necessary working drawings and specification for the erection of the buildings; 2, that Messrs. Duncanson & Henderson be appointed as measurers for the same; and 3, that the secretary be authorised to advertise for tenders for the several works connected with the buildings. The minutes also contained a report by the city engineer as to the erection of artisan dwellings in Macleod Street, Townhead. The report stated that the plans provided fourteen houses of two rooms and one house of three apartments. These, rated at 9l. 18s. and 14l. 10s. respectively, gave a gross rental of 153l. 10s. The estimated cost of the buildings was 2,252l., and the area of the site was 456 square yards. Making the usual abatement of 25 per cent. on the rental, and charging interest at 3½ per cent. on the outlay, there was left a surplus of 36l., which was equivalent to an overhead price of 1l. 11s. 6d. per square yard for the site. Similar recommendations were offered about plans, quantities and tenders. The Glasgow Improvement Trust have approved of the schemes.

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CAMBRIDGE SEWERAGE WORKS.

MEMBERS of the Liverpool Engineering Society on Saturday paid a visit to Cambridge. Before inspecting the works of the new sewerage scheme, they were conducted over some of the University colleges by the engineer-in-chief of the sewerage works, Mr. J. T. Wood, accompanied by the president of the Society, Professor H. S. Hele-Shaw. Among the places of interest visited were the chapel of King's College, the halls and combination rooms of St. John's and Trinity. At Trinity the members inspected the remarkable kitchen and cellars. After a hurried glance at some of the more interesting features of the different colleges, they set out for an inspection of the sewerage works in progress. The plans relating to the scheme were exhibited and explained by Mr. Wood. The existing sewers by which the town is drained discharge directly into the river Cam, on which the town and colleges abut. These sewers have for the greater part been constructed in brickwork, and at a time when the importance of good workmanship and proper alignment were not considered so essential as in these days of sanitary reform; consequently many of the existing drains have become reservoirs of deposit, and but inadequately perform the objects for which they were intended. The Corporation, acting on the advice of their engineer, determined to have an entirely new system of sewers laid down and the old ones removed, or cleaned out and blocked up. The works now in progress comprise the construction of $1\frac{3}{4}$ mile of brickwork sewers, about 32 miles of pipe sewers, and 23 miles of surface-water drains. The drains for the surface water will discharge directly into the river. The sewage will be collected and discharged into a well at the pumping station, situate on the banks of the river Cam, at the north end of the town. It will be pumped from there, and forced through the 24-inch cast-iron rising main into the settling tanks at the sewage farm, over two miles away from the town. After chemical treatment in the tanks, the liquid portion of the sewage will be spread over some 70 acres of land (which is being specially underdrained), and will ultimately be discharged in an unoffensive state into the river Cam, some four miles below the town. The solid matter deposited in the tanks will be collected and compressed by mechanical means, and finally sold or used as manure. The works at the pumping station and destructor are practically complete. The engines and pumps have been constructed by Messrs. Hathorn, Davey & Co., of Leeds. They are two compound differential

expansive engines of seventy horse-power each, capable of delivering about 270,000 gallons per hour. The destructor for the disposal of house and trade refuse has six cells, with a chimney about 175 feet high. Between each pair of cells is placed a Babcock and Wilcox boiler in which steam and eighty pounds pressure for driving the pumping engines will be generated. These destructors contain many novel points introduced by Mr. J. A. Brodie, Mr. Wood's partner, and it is believed they will prove very efficient, as they have been carefully designed to generate the maximum amount of heat with the minimum amount of nuisance.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 11328. Archibald Griffin Rider, for "Improvements in sliding-sash windows."
- 11344. Hugh Thomson, for "Improvements in apparatus for flushing water-closets."
- 11410. Herbert Clarke, for "A window or door fastener."
- 11470. Friedrich Kessler, for "A springless automatic door-closing device."
- 11495. Charles Field, for "Improvements in ventilators and chimney-tops."
- 11588. Harry Dews, for "Improvements in bolts for locks, latches and the like."
- 11687. Samuel Willoughby, for "A new or improved machine for removing the deposit from sewer-gulleys or the like."

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